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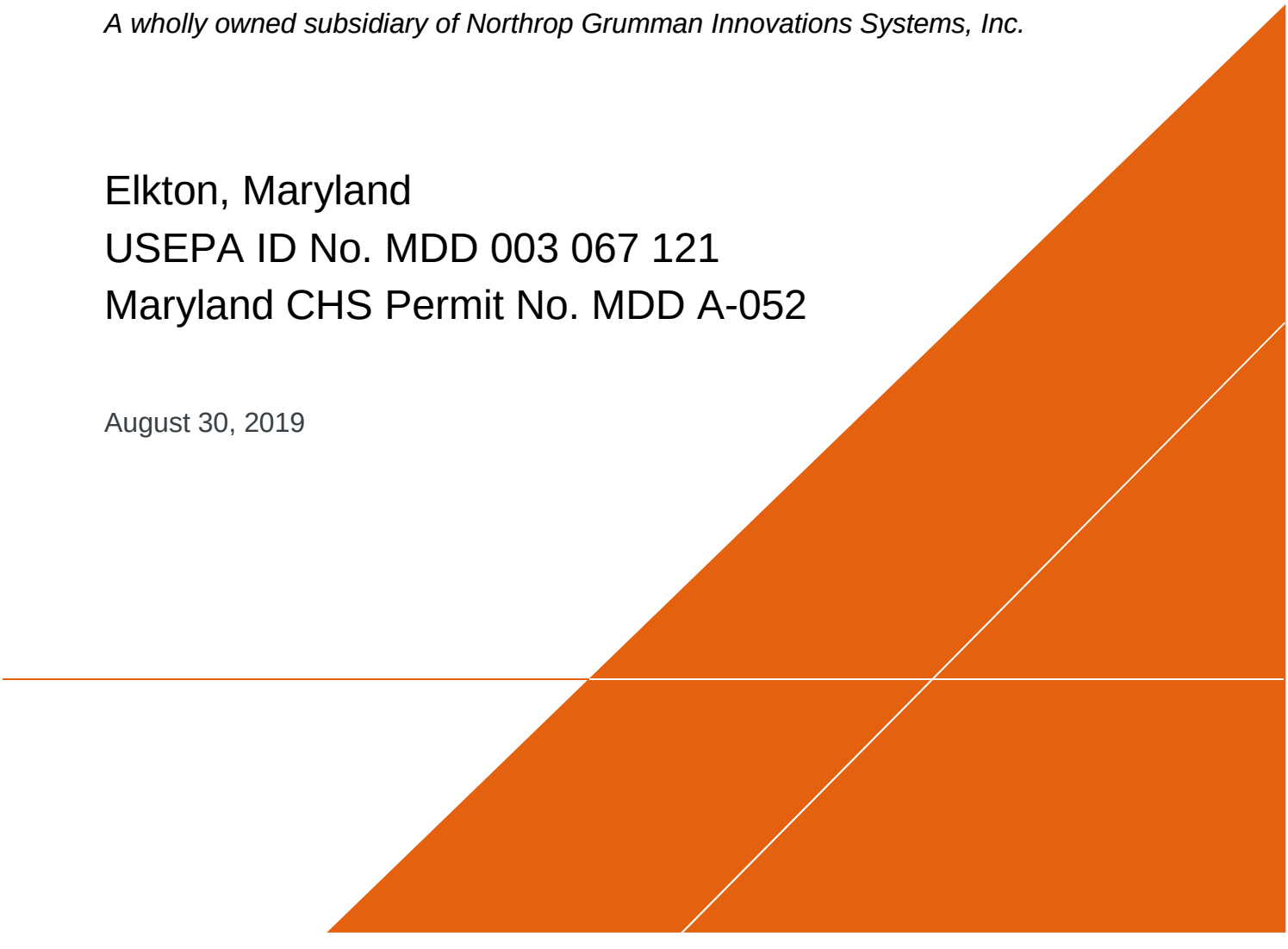
CORRECTIVE MEASURE IMPLEMENTATION (CMI) – 2019 ANNUAL PROGRESS REPORT

Alliant Techsystems Operations LLC

A wholly owned subsidiary of Northrop Grumman Innovations Systems, Inc.

Elkton, Maryland
USEPA ID No. MDD 003 067 121
Maryland CHS Permit No. MDD A-052

August 30, 2019



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ACRONYMS AND ABBREVIATIONS

A-Area SWMU	Abandoned Propellant Open Burn Area SWMU
AOC	Area of Concern
Arcadis	Arcadis U.S., Inc.
ATK	Alliant Techsystems Operations, LLC
Beryllium SWMU	Buried Beryllium Waste SWMU
bgs	below ground surface
BHC	benzene hexachloride
C-Area SWMU	Closed Incineration Feed Surface Impoundment SWMU
CA	Corrective Action
CAO	corrective action objective
CHS	Controlled Hazardous Substances
CMI	Corrective Measures Implementation
CMIWP	Corrective Measures Implementation Work Plan
CMS	Corrective Measures Study
COC	constituent of concern
DCA	dichloroethane
DCE	dichloroethene
ft	foot or feet
IEC	institutional and engineering control
MCL	Maximum Contaminant Level
MDE	Maryland Department of the Environment
NO_3–N	nitrate-nitrogen
POC	point of compliance
PRGs	preliminary remediation goals
RA	response actions
RCRA	Resource Conservation and Recovery Act
Sand Pit SWMU	Sand Pit Disposal Area SWMU
Site	Alliant Techsystems Operations, LLC facility
SOP	Standard Operating Procedure

Still Bottoms SWMU	Solvent Recovery Still Bottoms Disposal Area SWMU
SWMU	Solid Waste Management Unit
TCA	trichloroethane
TCE	trichloroethene
TKN	total Kjeldahl nitrogen
TN	total nitrogen
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
µg/L	micrograms per liter

EXECUTIVE SUMMARY

Final Remedy Corrective Measures were approved by United States Environmental Protection Agency (USEPA) to address environmental concerns at Solid Waste Management Units (SWMUs) identified for the Alliant Techsystems Operations LLC Elkton facility located at 55 Thiokol Road, Elkton, Maryland, 21921 (Site). These SWMUs are the Trichloroethene (TCE) Area SWMU, Abandoned Propellant Open Burn Area SWMU (A-Area SWMU), Buried Beryllium Waste SWMU (Beryllium SWMU), Closed Incinerator Feed Surface Impoundment SWMU (C-Area SWMU), and Pesticide Area SWMU. In the Final Decision for the Site, the USEPA approved the Final Remedy, which consists of:

- Long term groundwater, surface water, and pore water monitoring;
- Compliance with and maintenance of land and groundwater use restrictions;
- Engineering controls; and,
- Soil management including consolidation and capping at the Pesticide and Sewer Line Areas.

This Corrective Measures Implementation - 2019 Annual Progress Report (CMI Progress Report) documents performance monitoring activities that were undertaken between September 1, 2018 and August 31, 2019 in accordance with the USEPA-approved Corrective Measures Implementation Work Plan (CMIWP; Arcadis U.S., Inc. 2017) and summarizes the field data and laboratory results for SWMUs with groundwater monitoring requirements. This CMI Progress Report also includes an evaluation of the groundwater quality for each of the SWMUs relative to the short-term performance goals and overall natural attenuation progress.

The annual performance monitoring involved the collection and analysis of groundwater, porewater, and/or surface water samples at TCE Area, A-Area, Beryllium Area, and C-Area SWMUs. In accordance with the procedures detailed in the approved CMIWP, groundwater samples were collected from 21 wells in the TCE Area SWMU, two wells in the A-Area SWMU, one well in the Beryllium Area SWMU, and 13 wells in the C-Area SWMU using a low-flow sampling technique. Porewater was sampled in Little Elk Creek at two locations associated with the TCE Area SWMU and one location associated with the Beryllium Area SWMU using drive point samplers. Grab surface water samples for Little Elk Creek were obtained at four locations associated with the TCE Area SWMU and one location associated with the Beryllium Area SWMU by directly filling the sample container from the stream at the designated location at low-stage conditions in Little Elk Creek to the extent practicable. Samples were shipped to TestAmerica Laboratories and analyzed for target compound list volatile organic compounds (VOCs), 1,4-dioxane, perchlorate, sulfate, total organic carbon, and dissolved iron as specified in the approved CMIWP.

The deviations from the performance monitoring program of the CMI consisted of the following:

- Pesticide Area SWMU was not sampled, as the CMI of the final remedy was not yet completed.
- C-Area SWMU wells MW-11, MW-20, and MW-22 were sampled for total Kjeldahl nitrogen, total nitrogen, and nitrate-nitrogen to comply with requirements of the Maryland Department of the Environment Controlled Hazardous Substance Permit A-052.

Institutional and Engineering Controls (IECs) for the Beryllium SWMU were verified through visual observations of the fencing, signage, and vegetative cover. Letters were sent to the Cecil County Health

Department and Elkton Building and Zoning Department as part of the IECs showing off-site areas with groundwater contamination, where groundwater use restrictions such as the installation of new potable wells are recommended. Additionally, a coordinate survey of the A-Area and Beryllium SWMUs was conducted to define the boundary of excavation restrictions. A Soil Management Plan including a Health and Safety Plan is in place describing procedures for subsurface soil excavation at the A-Area SWMU, Pesticide SWMU, and Beryllium SWMU; the plan will be modified to include the C-Area SWMU in 2019.

Results of the groundwater monitoring at the TCE-Area SWMU indicate that perchlorate concentrations exceeded its numerical corrective action objective (CAO) (14 micrograms per liter [µg/L]) at 10 of the 21 groundwater monitoring locations during the March 2019 sampling event while TCE concentrations exceeded its numerical CAO (5 µg/L) at 12 of the 21 performance monitoring wells. Perchlorate concentrations at the sentinel wells were below the reporting limits and indicated that off-site impacts may be limited in aerial extent off-site. The surface and porewater monitoring results were indicative of natural attenuation of TCE and perchlorate along the flow path of the creek; although, due to the migration of the plume, TCE concentrations observed at select surface water and porewater sample locations in the TCE-Area SWMU were higher than those observed in 2018. Statistical trend analysis demonstrates that VOC and perchlorate concentrations are stable-to-declining at most performance monitoring wells in the TCE Area SWMU providing evidence of a stable-to-shrinking plume.

For the A-Area SWMU, perchlorate concentrations exceeded the numerical CAO (14 µg/L) at both performance monitoring wells while TCE and 1,4-dioxane exceeded their numerical CAOs at well GM-1B during the March 2019 event. TCE concentrations demonstrated a decreasing trend at GM-1B and comparing the March 2019 event results to those from March 2004 and November 2002 events indicates that perchlorate concentrations are generally stable, although the perchlorate concentration observed in March 2019 is slightly higher than that observed in March 2018 at GM-1B. These results are indicative of ongoing natural attenuation process in the A-Area SWMU.

Performance monitoring of the 13 C-Area SWMU wells showed perchlorate concentrations exceed the CAO at all sampled wells while TCE exceeded CAO at seven of the 13 wells. Statistical trend analysis of past and current data, however, indicates that VOC and perchlorate concentrations exhibit stable-to-declining trends at most of the 13 performance monitoring wells. These trends are indicative of a stable-to-shrinking plume as a result of continued operation of the active treatment system and possible aerobic or abiotic attenuation in areas upgradient of the treatment system.

No numerical CAOs for the Beryllium SWMU were established due to the nature of the closure of the Beryllium SWMU as waste-in-place and the demonstrated low potential for migration of hazardous waste or hazardous waste constituents from the SWMU via the shallow zone to water supply wells or to surface water. During the March 2019 event, groundwater samples exhibited detections of primarily metals; most of the semi-volatile organic compounds and VOCs constituents were not detected above laboratory detection limits. Visual observations of fences and signs around the Beryllium SWMU soil cover system indicate that the components of the IECs are performing as designed. Dense tree cover is present throughout the SWMU, and there are no signs of disturbance or trespassing in the area.

The Soil Management Plan along with modifications to the Site's dig permit system outlining procedures for subsurface soil excavation at the A-Area SWMU, Pesticide SWMU, and Beryllium SWMU were approved by the USEPA on April 17, 2018; the plan will be modified to include the C-Area SWMU in 2019. The Environmental Covenant for the Site will not be completed until the cap is in place and land

use restrictions are recorded to incorporate the final Pesticide SWMU Area of Concern (AOC) surveyed coordinates.

Performance monitoring of the Pesticide SWMU AOC was not performed during the March 2019 event. Performance monitoring of this area will be performed after final remedy is in place and is anticipated to be presented in the next annual report.

Based on the results of the performance monitoring and statistical trend analysis of past and current data, it can be concluded that although certain constituent of concern (COCs) exhibited exceedances of their numerical CAOs at certain monitoring locations during the March 2019 sampling event, overall, COC trends demonstrate groundwater quality improvements. Many COCs exhibited stable-to-decreasing trends throughout the study area (TCE Area, A-Area, and C-Area SWMUs). This provides evidence of stable or shrinking plumes. For the third year of CMI, changes to the performance monitoring program are not currently recommended.

1 INTRODUCTION

This Corrective Measures Implementation - 2019 Annual Progress Report (CMI Progress Report) has been prepared by Arcadis U.S., Inc. (Arcadis) on behalf of Alliant Techsystems Operations LLC (ATK), a wholly owned subsidiary of Northrop Grumman, for the ATK facility located at 55 Thiokol Road in Elkton, Maryland (the Site) shown on **Figure 1-1**. The environmental conditions requiring post-closure remedial action at the Site are being addressed under the United States Environmental Protection Agency (USEPA) Region III Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) Program. The complete RCRA Permit consists of two portions. The first is the CA Permit, MDD 003 067 121, issued by USEPA on May 26, 2017 (herein referred to as the 2017 RCRA CA Permit), which addresses provisions of the Hazardous and Solid Waste Amendments of 1984, 42 United States Code 6901-6992k. The second portion is the Controlled Hazardous Substances (CHS) Post-Closure Permit, MDD A-052, issued by the Maryland Department of the Environment (MDE) in August 2005 (herein referred to as the MDE CHS Permit), which addresses the provisions of the Code of Maryland Regulations 26.13 and is administered by MDE in lieu of the federal hazardous waste management program under RCRA.

The Site consists of seven Solid Waste Management Units (SWMUs) at which different remedies are being implemented. These SWMUs are the Trichloroethene (TCE) Area SWMU, Abandoned Propellant Open Burn Area SWMU (A-Area SWMU), Buried Beryllium Waste SWMU (Beryllium SWMU), Closed Incinerator Feed Surface Impoundment SWMU (C-Area SWMU), Solvent Recovery Still Bottoms Disposal Area SWMU (Still Bottoms SWMU), Sand Pit Disposal Area (Sand Pit SWMU) and Pesticide Area SWMU Area of Concern (AOC).

On May 26, 2017, USEPA Region III issued a Final Decision pursuant to the Solid Waste Disposal Act, as amended by the RCRA of 1976, Hazardous and Solid Waste Amendments of 1984, and 42 United States Code Section 6901, et seq. In the Final Decision for the Site, the USEPA approved the Final Remedy, which consists of:

- Long term groundwater, surface water, and pore water monitoring;
- Compliance with and maintenance of land and groundwater use restrictions;
- Engineering controls; and
- Soil management including consolidation and capping at the Pesticide and Sewer Line Areas.

Pursuant to the CA Permit issued with the Final Decision, a Corrective Measures Implementation Work Plan (CMIWP; Arcadis 2017) for the implementation of the Final Remedy was submitted to USEPA on July 25, 2017 and approved on October 4, 2017.

This CMI Progress Report documents monitoring and institutional control verification activities performed during the second year of CMI, which comply with CA and monitoring requirements of the 2017 RCRA CA Permit. The objective of this CMI Progress Report is to evaluate and document progress toward reaching numerical Corrective Action Objectives (CAOs) and provide institutional and engineering controls (IEC) verification. This CMI Progress Report includes an evaluation of natural attenuation at the TCE Area SWMU and long-term monitoring results for the A-Area, C-Area, and Beryllium SWMUs against the short-term performance goals and includes recommendations for the next year of CMI activities. The Final

Remedy for the Site does not include any activities specific to the Still Bottoms and the Sand Pit SWMUs; therefore, they are not discussed in this report.

1.1 Report Organization

In addition to the above introduction, this CMI Progress Report consists of the following sections:

- Site Background (Section 2) – presents the location, a brief history of the Site, and a summary of the environmental conditions at each SWMU;
- Final Remedy Description (Section 3) – summarizes the response actions (RAs) in place at each SWMU;
- Corrective Action Objectives (Section 4) – presents the performance goals and numerical CAOs for each SWMU;
- Methodology and Data Collection (Section 5) – summarizes the activities conducted at the Site to obtain performance monitoring data during this reporting period;
- Data Analysis and Evaluation (Section 6) – presents the compiled field data and analytical results from the 2019 sampling event and provides an assessment of the remedial performance at each SWMU;
- Conclusions and Recommendations (Section 7) – provides a summary based upon analysis of the data from each SWMU and recommendations for future actions at the Site; and
- References (Section 8) – lists references cited in this CMI Progress Report.

2 SITE BACKGROUND

This section presents a summary of the Site history, the environmental setting, and current conditions.

2.1 Site Description

The ATK Elkton facility occupies approximately 550 acres in Elkton, Cecil County, Maryland (**Figure 1-1**). Since the 1930s, the property has been primarily used for industrial purposes such as fireworks manufacturing, munitions production, pesticide production, research, and production of solid propellant rockets.

In 1984, the discovery of contamination in two production wells (W-1 and W-7) prompted ATK to investigate and identify the potential source(s) and characterize the extent of the TCE, perchlorate, and other volatile organic compounds (VOCs) in groundwater. Initial investigations included interviews with personnel regarding disposal practices and multiple site inspections by ATK personnel, as well as an USEPA Field Investigation Team 3 inspection on December 17, 1984. ATK entered into the RCRA CA Program in 1989. Groundwater investigations performed in 1998 concluded that the contaminant source(s) were likely related to multiple, diffuse release areas across the facility (Arcadis 2016). The USEPA identified the following seven SWMUs at the Site (**Figure 2-1**):

- TCE Area SWMU
- A-Area SWMU
- Beryllium SWMU
- Still Bottoms SWMU
- C-Area SWMU
- Sand Pit SWMU
- Pesticide SWMU AOC

The Final Remedy for the Site does not include any activities specific to the Still Bottoms and the Sand Pit SWMUs; therefore, they are not discussed further in this report.

2.2 Geology and Hydrogeology

2.2.1 Site Geology

The Site geology is described in the 2007 Site-Wide Corrective Measures Study Report (CMS Report; Arcadis 2007). Borings on and near the Site reveal that bedrock is micaceous, feldspar gneiss. The bedrock surface is smoothly undulating with a general southeast trend. Irregularities in the bedrock surface are probably a result of differential weathering, as evidenced by the varying thickness of the overlying saprolite (weathered bedrock) encountered in well borings. The thickness of saprolite ranges from 5 feet (ft) to 64 ft. The saprolite is micaceous, silty, and friable, becoming more cohesive and resistant to drilling with depth.

The sediments of the Potomac Group overlie the bedrock/saprolite. Regionally and locally, the sediments of the Potomac Group are chiefly white to gray quartz or feldspar sands, interbedded with variegated clays and silts. Some clay layers contain abundant lignite and pyrite, while others have yielded siderite, hematite, or limonite. Above the weathered bedrock, quartz pebbles have been found intercalated with micaceous clay.

A layer of predominantly fine sandy silt (varying in thickness from 18 to 35 ft) was encountered at the base of the Potomac Group in boreholes throughout the Site. Minor amounts of fine sand and clay are interspersed throughout the silt, and occasionally quartz pebble gravel is also included. Thin beds of lignite are interstratified at most locations.

The Potomac sediments above the basal silt are much more variable in composition. Interstratified sands, silts, and clays make up the majority of sediments, with occasional peat or gravel beds included. Lateral discontinuity within the Potomac Group renders correlation of most beds uncertain, even over short distances.

Quaternary alluvium overlies the Potomac Group and is composed of heterogeneous mixtures of clay, silt, sand, and gravel. Alluvium is associated with river and estuary depositional environments and, at the Site, occurs along Little Elk Creek and its tributaries. Limited data indicate an alluvial thickness of 0 to 40 ft. These beds are extremely variable in their horizontal and vertical extent. Further detail regarding Site geology is provided in the conceptual site model included as Appendix A of the *2004 Site-Wide Investigation Report* (Investigation Report; Arcadis 2004).

2.2.2 Site Hydrogeology

Site hydrogeology is presented in the CMS Report (Arcadis 2007). There are three groundwater flow regimes in the vicinity of the Site: a shallow zone of the Potomac Group aquifer, an intermediate zone of the Potomac Group aquifer, and a saprolite unit below the Potomac Group. Groundwater flow in the shallow zone is generally influenced by topography (recharge) and surface water flow. Groundwater discharge to Little Elk Creek appears to occur in the upper reaches of the creek in the northwestern portion of the Site. At the southeast side of the Site, discharge from the creek may be occurring.

Groundwater flow in the Potomac Group aquifer is to the east/southeast of the Site. The intermediate zone groundwater potentiometric contours are in accordance with regional flow patterns. Flow relationships between the intermediate zone and the overlying shallow zone and underlying saprolite unit appear to vary across the Site. In general, it appears the intermediate zone acts as a recharge zone in the northwestern portion of the Site and a discharge zone in the southeastern portion of the Site.

Groundwater flow in the saprolite is generally to the east in accordance with the regional flow directions. However, groundwater flow in the saprolite is influenced by pumping of on-site groundwater production well W-7.

A slight downward gradient has been observed in water level data from the shallow zone to the deeper units, the intermediate zone, and the saprolite. This occurs primarily in the main plant area. Moving eastward from the main plant area toward U.S. Route 40 and Little Elk Creek, a transition occurs where vertical gradients are neutral to upward. Upward gradients have been observed historically at GM-16 near Little Elk Creek. Water level data indicate groundwater in GM-16 is artesian (Shallow [S], Intermediate [M], and Deep [D]).

Low TCE concentrations detected in some saprolite unit samples collected at the main plant and non-detects east of the Site also confirm this trend in water levels. Further detail regarding site hydrogeology is provided in the conceptual site model included as Appendix A of the Investigation Report (Arcadis 2004) and the *Final Corrective Measures Study Report Addendum* (CMS Report Addendum; Arcadis 2016).

2.3 SWMU Environmental Conditions

2.3.1 TCE Area SWMU

The TCE Area SWMU (**Figure 2-1**) consists of a groundwater plume containing elevated levels of TCE and perchlorate that occupies the southern and eastern extent of the main plant area and extends off-site to the east and south of U.S. Route 40. Investigative activities were completed in 2014 and the results are presented in the *Site Investigation Report Addendum* (Arcadis 2015). These results:

- Confirm the TCE plume is discharging to Little Elk Creek and not migrating through the deep saprolite unit;
- Support shallow zone groundwater flow to the northeast, east, and southeast toward Little Elk Creek, with intermediate zone groundwater flow generally resembling that of the shallow flow regime;
- Illustrate that groundwater flow patterns are locally affected in the vicinity of the on-site groundwater production well W-7; and
- Confirm, through soil gas sampling, that there is no vapor intrusion from site-impacted groundwater occurring off-site.

Site investigation activities demonstrated an upward flow component within the vicinity of Little Elk Creek and indicated that there is groundwater discharge to the creek from both the shallow and intermediate zones, including impacted groundwater from the TCE Area SWMU. The results did not support downward migration of constituents from the TCE Area SWMU to the deep saprolite unit (Arcadis 2000 and 2015).

The lateral extent of the plume is well-defined (USEPA 1999). In the shallow zone, TCE concentrations are highest in a relatively narrow north-to-south area on the west side of Little Elk Creek in the eastern portion of the TCE Area SWMU. In the intermediate zone, TCE concentrations are highest in a larger east-to-west area extending from the west side of Little Elk Creek to the west, past Elkton Road. Concentrations of perchlorate in the shallow zone are lower than TCE concentrations and follow the same general distributions. Low levels of TCE have been detected on the far side of Little Elk Creek. They appear to be the result of diffusion and transient stage fluctuation of water levels in the creek and do not suggest underflow beneath the creek under normal conditions.

As presented in the CMS Addendum (Arcadis 2016), a review of the data collected to date for the TCE Area SWMU relative to USEPA guidelines for assessing natural attenuation indicates that attenuation of TCE, cis-1,2-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), 1,1-DCE, and perchlorate is occurring at the Site and that adverse impacts are unlikely for aquatic organisms that may be exposed to the surface water in Little Elk Creek.

The 2007 Site-Wide Risk Assessment identified recreational users exposed to constituents in surface water and sediments as the only potentially complete exposure routes for the TCE Area SWMU. The human health risk evaluation conclusions reached in the 2007 Site-Wide Risk Assessment remain valid. The calculated excessive lifetime cancer risks and non-cancer hazard indices for adult and child recreational users were within the USEPA's acceptable range of 1×10^{-6} to 1×10^{-4} for the excessive lifetime cancer risks and lower than the threshold of 1 for non-cancer hazard indices (Arcadis 2016).

The *Corrective Measures Implementation – 2018 Annual Progress Report* (2018 Annual CMI Report; Arcadis 2018b) further evaluated the performance of natural attenuation at the TCE Area SWMU. Concentrations of VOCs and perchlorate were stable or declining at most performance monitoring wells. TCE and perchlorate concentrations exhibited declining trends or no trend at the plum-core wells. Plume periphery wells GM-16M, GM-16S, and GM-30M showed increasing trends, indicating the migration of the plume centroid along the groundwater flow path toward Little Elk Creek. Detections of TCE and 1,1,1-TCA daughter products and declining trends observed in 2018 indicated a generally stable or shrinking plume due to natural attenuation via abiotic or biological degradation pathways.

2.3.2 A-Area SWMU

The A-Area SWMU (**Figure 2-1**) is located near the eastern boundary of the Site and was used for the disposal of waste solid fuel rocket propellant by open burning operations in the 1950s. The area was closed in 1958, and surface materials were removed (FWA Environmental Science Inc. 1992). The A-Area SWMU is partially encompassed by the TCE Area SWMU and shares the same flow regimes and hydrogeological characteristics. The northern portion of the A-Area SWMU may contain groundwater flow paths that trend northeast toward Little Elk Creek. Perched water was identified in some borings in the A-Area SWMU at a depth of less than 5 ft below ground surface (bgs). Groundwater is typically found at a depth of 15 ft bgs in this SWMU.

The CMS Addendum (Arcadis 2016) retained TCE, 1,4-dioxane, 1,1,2,2-tetrachloroethane, and perchlorate as constituents of potential concern and concluded that while the current conditions in the A-Area SWMU are acceptable for future site workers, additional measures should be taken to reduce potential exposures for future construction workers to volatile constituents while working in trenches in this area.

The 2018 Annual CMI Report (Arcadis 2018b) concluded that natural attenuation was ongoing at the A-Area SWMU, as perchlorate concentrations were stable at GM-1B and declining at GM-15M, and TCE and 1,1,1-TCA daughter products were observed, along with declining TCE concentrations at GM-1B.

2.3.3 Beryllium SWMU

The Beryllium SWMU is an area of approximately 40 ft by 170 ft located in the northern portion of the Site (H-Area) adjacent to Little Elk Creek (**Figure 2-1**). Beryllium propellant waste articles were buried in several 6-foot-deep trenches between 1962 and 1969. Buried waste was placed in two trenches approximately 4 ft by 40 ft in one area and in one trench 4 ft by 20 ft in another area within this SWMU. The buried waste area was subsequently covered with soil in 1970. Subsurface investigation of the Beryllium SWMU has been limited by the potentially ignitable and hazardous nature of the buried waste.

Currently, the Beryllium SWMU soil cover is heavily wooded and fenced to restrict access by site personnel and trespassers.

Hydrogeologic units in the Beryllium SWMU consist of a shallow unconsolidated unit and underlying saprolite. Recent investigations indicate that groundwater flow in both the water-bearing units is to the west-southwest, eventually discharging to Little Elk Creek. Groundwater is encountered in the Beryllium SWMU at a depth of less than 10 ft bgs. Recent investigations have indicated screening level exceedances for perchlorate, and, to a lesser degree, 1,1-DCE and thallium in groundwater downgradient from the Beryllium SWMU. Due to apparent low transmissivity of the hydrogeologic units encountered near the Beryllium SWMU, SWMU-related dissolved constituents in groundwater are not likely to continue to migrate or ever reach nearby surface water receptors, such as Little Elk Creek or water supply wells. No performance goals were established for the Beryllium SWMU due to the nature of the closure as waste-in-place and the low potential for migration of hazardous waste, or hazardous waste constituents, via the uppermost aquifer to water supply wells or to surface water

The human health risk assessment updated in the CMS Addendum (Arcadis 2016) concluded that current surface soil (0 to 4 ft bgs), sediment, groundwater, and surface water conditions in the Beryllium SWMU are acceptable for the potential current and future receptors evaluated. The CMS Addendum additionally noted that there is significant potential for physical hazards associated with this SWMU (i.e., potentially ignitable nature of the waste remaining in place and potentially release of emissions, including dust containing beryllium or beryllium compounds, if the waste is disturbed). Therefore, engineering and institutional controls are required.

2.3.4 C-Area SWMU

The C-Area SWMU is located in the C-Area in the northwestern portion of the Site (**Figure 2-1**). From 1976 to 1987, a rubber-lined impoundment was used to store the incinerator feed (ammonium perchlorate, water, and solvents). In 1985, ATK detected solvents in downgradient monitoring wells. After the surface impoundment was drained, it was determined the rubber liner had failed, and the liner was subsequently replaced. In 1988, the liner and a 3-ft thickness of soil beneath the area were removed and replaced with a clay cover.

The hydrogeologic units in the SWMU are characterized by shallow unconsolidated and saprolite zones. Groundwater flow in this area is generally to the west-southwest discharging to Little Elk Creek. Contaminated groundwater in this area is confined to the shallow zone and is unlikely to extend beyond Little Elk Creek. ATK installed a groundwater interceptor trench and infiltration gallery with an air stripper system that was activated in 1993. The remedial system has resulted in the containment of high VOC concentration areas and a significant decline of VOC concentrations in the vicinity of the system. An edible oil in situ reactive zone remedy was added in 2003, and injections were performed in four phases that took place from 2003 through 2007. The recirculation trench was temporarily shut down in 2012 due to low water levels and problems with iron fouling in the centrifugal pump and was operated intermittently until 2015. In April 2015, a jet pump was installed, and the system has been operating with only minor service interruptions since that time.

Recent monitoring at the SWMU under MDE CHS Permit No. MDD A-052 indicates that VOCs (predominantly TCE, 1,1,1-TCA, 1,1-DCE, and tetrachloroethene) and perchlorate in groundwater remain at concentrations greater than the respective USEPA Maximum Contaminant Level (MCL) or the USEPA

Region III tap water risk-based concentrations. Perchlorate is generally more prevalent at this SWMU than other SWMUs due to the historical open burning of ammonium perchlorate fuel. The area of elevated VOC and perchlorate concentrations in this portion of the Site has been well-defined.

The 2018 Annual CMI (Arcadis 2018b) concluded that VOC concentrations are exhibiting a stable-to-declining trend at most of the C-Area SWMU monitoring wells and are indicative of a shrinking plume due to the continued operation of the active treatment system.

2.3.5 Pesticide SWMU AOC and Sewer Line Area

The Pesticide SWMU AOC is located in the southwestern portion of the Site, south of the Little Elk Creek. The property was owned by Geigy Chemical Company (1947-1955; Syngenta Crop Protection, Inc. is the corporate successor to Geigy Chemical Company) and Olin Mathiesen Chemical Corporation (1955-1958; Olin Corporation is the corporate successor to Olin Mathiesen Chemical Corporation). In 1958, the property was sold to OA. There are four sub-areas within the Pesticide SWMU AOC:

- Burn Pit Area
- Ridge Area
- Tar and Ash Area
- Incineration Area

Contamination in the Pesticide SWMU AOC is generally limited to chlorinated pesticides in surface soils, primarily 4,4'-dichlorodiphenyltrichloroethane and its metabolites. Subsurface contamination was observed only in the Burn Pit portion of the SWMU. Contaminated soils are located 50 to 90 ft above the groundwater table in this area. Sampling of soils and ditch bottom materials south of the Pesticide SWMU AOC indicates that the SWMU is not a significant source of off-site transport via runoff even prior to implementation of CA.

Surface drainage in the SWMU is generally to the south (i.e., away from Little Elk Creek). A portion of the Ridge Area drains north, toward Little Elk Creek. An extensive Interim Remedial Measure was completed in the Ridge Area in 1991 to remove debris and visibly contaminated surficial material (Woodward-Clyde Consultants 1991). This Interim Remedial Measure significantly reduced the potential for surficial contamination in the Ridge Area to impact Little Elk Creek.

The hydrogeologic units in the Pesticide SWMU AOC are characterized by a shallow unconsolidated zone and saprolite zone. Potential for leaching of the chlorinated pesticides is limited by their low solubility and high tendency to adsorb to soils. Low concentrations of pesticides are detected in a shallow unconsolidated groundwater zone immediately east of soil source areas. Groundwater flow is generally toward the northeast and east and is likely intercepted by Little Elk Creek. 2014 monitoring results indicated eight pesticides exceeded screening levels in at least one sample (4,4'-dichlorodiphenyldichloroethane, alpha-benzene hexachloride [BHC], beta-BHC, delta-BHC, gamma-BHC, dieldrin, endrin ketone, and heptachlor epoxide).

3 FINAL REMEDY DESCRIPTION

The selected remedy for the TCE Area SWMU and the A-Area SWMU groundwater is monitored natural attenuation until CAOs are met, and compliance with, and maintenance of, groundwater use restrictions to prevent the exposure to contaminants while concentrations remain above drinking water standards.

A restriction of soil excavation was put in place at the A-Area SWMU and the Beryllium SWMU in 2018, as required by the 2017 CA Permit. The soil excavation restriction area is shown in **Figure 3-1** and 2019 surveyed coordinates are presented in **Appendix A**. Any soil excavation or earth moving activities at these sites must comply with the *Soil Management Plan* (Arcadis 2018a).

The remedy in the Beryllium SWMU also includes a monitoring program to verify the integrity of the existing cover system. The existing cover system is to be inspected on an annual basis. This inspection includes observations and assessment of soil and vegetative cover conditions, as well as capturing photos of the fences and signs around the Beryllium SWMU. The results of 2019 inspection are presented in Section 6.2.

The selected remedy in the C-Area SWMU consists of continued hydraulic containment by pump-and-treat to prevent further migration of groundwater and ex situ treatment of contaminated groundwater with permitted discharge of the treated groundwater to Little Elk Creek (MDE CHS Permit No. MDD A-052). The remedy also includes compliance with, and maintenance of, groundwater use restrictions to prevent exposure to contaminants while concentrations remain above drinking water standards. IECs for this SWMU are required by MDE CHS Permit No. MDD A-052. The groundwater use restrictions are implemented on a site-wide basis and include the C-Area SWMU. A restriction on soil excavation was put in place at the C-Area SWMU and will be added to the *Soil Management Plan* (Arcadis 2018a). Coordinates of the restricted area in the C-Area SWMU are presented in **Appendix A**.

The remedy for the Pesticide SWMU AOC includes excavation of soil from the Ridge Area and Tar and Ash Area for consolidation beneath a low permeability cap consisting of a geosynthetic clay liner and an overlying drainage/clean soil cover to be located at the Burn Pit and Incineration Areas. An additional asphalt cap is proposed for construction over the Sewer Line Area. Maintenance of the caps will be described in an Operations and Maintenance Plan to be submitted to the USEPA and MDE with the final design.

Site-wide institutional controls include establishment of a deed restriction to limit the property to non-residential use and to prohibit the use of untreated groundwater on and near the Site until numerical CAOs are met. Other than the site-wide residential and groundwater use controls, no specific IECs were required for the TCE Area SWMU, Still Bottoms SWMU, and the Sand Pit SWMU. Site-wide engineering controls consist of existing fencing and controlled access via security gates.

4 CORRECTIVE ACTION OBJECTIVES

The 2017 RCRA CA Permit recorded final CAOs for site soil and groundwater based on the following CMS evaluations:

- The CMS Report (Arcadis 2007) and the CMS Report Addendum (Arcadis 2016) that developed CAOs for the TCE Area SWMU, the A-Area SWMU, and the Beryllium SWMU.
- The Corrective Measures Study, Pesticide and Sewer Line Areas (GEI 2016) that developed CAOs for the Pesticide SWMU AOC.

4.1 Groundwater

The CAOs for site groundwater established for the CMI are:

- Restore groundwater to drinking water standards. The *Institutional and Engineering Controls Plan* and the *Soil Consolidation and Capping Plan, Pesticide and Sewer Line Areas* (Arcadis 2017) address the other CAOs for site soil and groundwater, as defined in the 2017 RCRA CA Permit.
- Verify no unacceptable exposure to downgradient receptors.

In addition, MDE CHS Permit MDD A-052 provides CAOs for the C-Area SWMU. It requires that a CA program be implemented at the C-Area SWMU at least until specified concentration limits for groundwater set by MDE CHS Permit MDD A-052 are met at well MW-2 and all on-site downgradient wells.

4.1.1 Short-Term Objectives

In the short term, the objectives of performance monitoring program for groundwater (as applicable for specific SWMUs) are as follows:

- Verify no unacceptable exposure to downgradient receptors;
- Verify the plume(s) is/are not expanding above levels of concern (either down gradient, laterally, or vertically);
- Detect changes in environmental conditions (e.g., hydrogeologic or geochemical) that may reduce the efficacy of the remedy;
- Identify the presence of transformation products;
- Detect new releases of contaminants to the environment that could impact the effectiveness of the remedy; and
- Comply with CA and monitoring requirements of the 2017 RCRA CA Permit and MDE CHS Permit MDD A-052 for C-Area SWMU.

4.1.2 Points of Compliance

Preliminary points of compliance (POCs), based on returning groundwater to its maximum beneficial use, were selected as monitoring points throughout the area of constituent of concern (COC)-impacted groundwater. Classification of all monitoring locations as POCs represents a “throughout-the-plume/unit

boundary" approach to the selection of POCs. The preliminary POCs include three locations intended to provide information regarding the downgradient extent of COCs ("sentinel wells" on both sides of Little Elk Creek in the TCE Area SWMU), nine locations (at multiple depths) intended to provide information regarding migration of impacted groundwater across the property boundary in the TCE Area SWMU, and three porewater sampling locations in Little Elk Creek at predicted zones of groundwater discharge (two in the TCE Area SWMU and one adjacent to the Beryllium SWMU), as well as additional groundwater monitoring locations throughout the TCE, A-Area, and Beryllium SWMUs to monitor stability and natural attenuation of the groundwater impacts.

Under MDE CHS Permit A-052, the POCs for groundwater in the C-Area SWMU are monitoring well MW-2 and all on-site downgradient wells.

The monitoring program, including the locations, media, and analytes is discussed in Section 5**.**

4.1.3 Numerical Performance Goals

In support of the CAOs, numerical performance goals were established based on USEPA MCLs for groundwater. For COCs with no MCLs, USEPA Region III regional screening levels for tap water were used, as described in the USEPA-approved CMS Report Addendum (Arcadis 2016). **Tables 4-1 and 4-2** identify the COCs for groundwater at the Site and their numerical CAO performance goals, as defined in the CMIWP (Arcadis 2017).

4.2 Institutional and Engineering Controls

The IEC objectives complement the groundwater performance monitoring objectives discussed above. Based on site conditions and the results of the human health and ecological risk evaluations presented in the CMS Addendum (Arcadis 2016), the following CAOs were established for the Site in the Statement of Basis developed by USEPA for the 2017 CA Permit:

- Manage future site use to restrict residential land use of areas within the property boundary.
- Maintain no unacceptable population-level ecological risks.
- Mitigate and/or maintain human health risks that are within or below USEPA benchmarks (i.e., cancer risk $1x10^{-4}$ and non-cancer hazard index of 1).
- Minimize and/or manage exposure to groundwater containing contaminant concentrations higher than media cleanup standards.
- Ensure that groundwater containing elevated concentrations of COCs will not impact ecological receptors nor adjacent surface water bodies until groundwater is restored to MCLs.

A SWMU-specific CAO established for the Beryllium SWMU consists of the following:

- Manage exposure to in situ waste in the Beryllium SWMU that poses a potential physical hazard. Because of the potential physical hazards associated with removal of impacted soils within this SWMU, IECs will be implemented to manage exposure.

The SWMU-specific CAOs established for the Pesticide Area SWMU consist of the following:

- Prevent human exposure to soils in the Pesticide SWMU AOC with COC exceeding applicable preliminary remediation goals (PRGs) presented in the CMS (as calculated based on the 95% upper confidence limit [UCL] on the mean for samples collected from unremediated locations in the Pesticide SWMU AOC and the Sewer Line Area.
- Prevent ecological exposures to soil in the Pesticide SWMU AOC with chemical concentrations exceeding the PRGs (based on the 95% UCL for remediated soils).
- Prevent off-site migration of soils in the Pesticide SWMU AOC exceeding the PRGs via wind and water erosion (based on the 95% UCL for remediated soils).

5 METHODOLOGY AND DATA COLLECTION

This section discusses the site activities performed during the reporting period for the CMI.

5.1 Groundwater Elevation Measurements

Prior to initiating groundwater sampling activities in March 2019, water-level measurements were collected from monitoring wells in the performance monitoring program (**Table 5-1**) within 24 to 72 hours of sample collection, to the extent possible, to minimize temporal variations. Water-level measurements are presented in **Table 5-2**, along with well construction details and sampling location coordinates.

5.2 Performance Monitoring

Performance monitoring activities were performed from March 19 to 27, 2019 in accordance with the Arcadis' Standard Operating Procedures (SOPs) provided in the approved CMIWP (Arcadis 2017). Groundwater samples were collected from from 21 wells in the TCE Area SWMU, two wells in the A-Area SWMU, one well in the Beryllium Area SWMU, and 13 wells in the C-Area SWMU using low-flow sampling methods. MW-11, MW-20, and MW-22 were additionally sampled for total nitrogen (TN), total Kjeldahl nitrogen (TKN), and nitrate-nitrogen (NO_3–N) to comply with requirements of MDE CHS Permit A-052 for the C-Area SWMU. Porewater was sampled in the Little Elk Creek at two locations associated with the TCE Area SWMU and one location associated with the Beryllium Area SWMU, using drive point samplers. Grab surface water samples for Little Elk Creek were obtained at one upgradient location, four locations associated with the TCE Area SWMU, and one location associated with the Beryllium SWMU, by directly filling the sample container from the stream at the designated location at low-stage conditions to the extent practicable. Samples were submitted under chain-of-custody to TestAmerica Laboratories, Inc. in Savannah, Georgia for analysis of Target Compound List VOCs by USEPA Method 8260; 1,4-dioxane by USEPA Method 8270 selective ion monitoring; and perchlorate by USEPA Method 314.1. Sulfate, total organic carbon, and dissolved iron were also analyzed in samples from select monitoring wells and pore water locations to describe ambient geochemical conditions and document changes over time. For samples collected from the Beryllium Area SWMU, semi-volatile organic compounds were also analyzed by USEPA Method 8270. Samples from C-Area SWMU wells MW-11, MW-20, and MW-22 were also analyzed for TKN, TN, NO_3–N per the requirements of the MDE CHS Permit A-052 for the C-Area SWMU.

Water quality parameters (i.e., dissolved oxygen, oxidation reduction potential, specific conductivity, temperature, turbidity, and pH) were measured throughout the purging and allowed to stabilize prior to sampling, following SOPs for low-flow groundwater sampling based on the *USEPA Region 1 Low Stress (Low Flow) Purging and Sampling Procedures for the Collection of Groundwater Samples from Monitoring Wells* (USEPA 1996). Field documentation, including equipment calibration forms, sampling forms, and chain-of-custody documents, is provided in **Appendix B**.

5.2.1 Data Validation and Usability

Arcadis personnel validated the analytical data collected during the groundwater monitoring events in accordance with *USEPA National Functional Guidelines for Superfund Methods Data Review for*

inorganic and organic compounds, respectively (USEPA 2016a; USEPA 2016b). Data validation included review of the laboratory report narrative for noted deficiencies and the potential impact to data usability; review of chain-of-custody documents, sample preservation, and sample receipt logs; and electronic data validation of selected quality control parameters. No major deficiencies were identified during the data validation process. Laboratory results are presented in **Appendix C** and data validation reports are presented in **Appendix D**.

5.2.2 Deviations from the Performance Monitoring Program

The following are deviations from the performance monitoring program that occurred during this year's activities:

- Wells at the Pesticide Area SWMU were not sampled, as the CMI of the remedy was not yet completed at the time of sampling. A status update regarding the CMI of the remedy for the Pesticide Area SWMU and Sewer Line Area is presented as **Appendix E**.
- Samples from C-Area SWMU wells MW-11, MW-20, and MW-22 were analyzed for TKN, TN, and NO_3–N to comply with requirements of the MDE CHS Permit A-052.
- The environmental covenant for the Site could not be recorded as the implementation of the remedy for the Pesticide Area SWMU is not yet complete and surveyed coordinates of the final remedy are not yet available.

5.2.3 Monitoring Well Abandonment

Monitoring wells that are not part of the performance monitoring network are being abandoned appropriated by ATK by a Maryland-licensed drilling company, AC Shultes Inc. A list of wells abandoned to date is presented as **Table 5-3** and well abandonment logs are presented in **Appendix F**.

5.3 Institutional and Engineering Control Measures

5.3.1 Beryllium SWMU IEC Verification

IECs for the Beryllium SWMU were verified through visual observations of the fencing, signage, and vegetative cover. Photos taken to document this IEC verification are presented in **Appendix G**.

5.3.2 Off-site Groundwater Use Restriction

Letters were sent to the Cecil County Health Department and Elkton Building and Zoning Department as part of the IECs describing off-site areas with groundwater contamination and depicting the area on a figure. The letters and delivery confirmation receipts are presented in **Appendix H**.

5.3.3 C-Area SWMU Survey

To support the soil excavation restrictions in the C-Area SWMU, a coordinate survey was conducted by Frederick Ward Associates to define the boundary of excavation restrictions and to establish latitude and longitude of each polygon vertex in a decimal degree format with at least seven decimal places and a

negative sign for west longitude using the World Geodetic System 1984 datum. The surveyed boundaries for soil excavation restrictions are shown on **Figure 3-1** and the coordinates are provided in **Appendix A**.

5.3.4 Soil Management Plan

Per the Site's RCRA permit, a Soil Management Plan was prepared to describe procedures for subsurface soil excavation at the A-Area SWMU, Pesticide SWMU, and Beryllium SWMU in 2018 and will be updated to include the C-Area SWMU in 2019. As part of this plan, the Site's dig permit system will be modified to include a figure depicting the C-Area SWMU with restrictions on soil disturbance and the following instructions:

- Any planned soil disturbance in one of the designated areas (C-Area SWMU) should be fully detailed in a request to, and pre-approved in writing by, the Site environmental engineer.
- The request should fully describe the extent and types of soil disturbance.
- The environmental engineer will define any preliminary investigations in the area to be disturbed, which may include soil and/or shallow groundwater sampling.
- Pending the results of the pre-disturbance investigations, the environmental engineer will define any soil management measures that must be incorporated into the planned activities that would disturb the soil.

6 DATA ANALYSIS AND EVALUATION

6.1 Performance Monitoring Results

The following sections summarize analytical results from the sampling event conducted in March 2019. Groundwater elevation contours for the shallow and intermediate zones are shown on **Figures 6-1** and **6-2**, respectively, while the analytical results for perchlorate, TCE, and 1,4-dioxane in shallow and intermediate zones are shown on **Figures 6-3** and **6-4**, respectively. The data callouts shown on **Figures 6-3** and **6-4** present the analytical data from the initial sampling date plus the three most recent sampling dates for that location; individual sampling locations may have been sampled multiple times during the intervening years. Analytical data collected in 2019 is presented on Tables 6-1 through 6-5. Historical analytical data are presented in **Appendix I**.

The TCE and perchlorate concentration isocontours for shallow and intermediate zones in the TCE Area, A-Area, and C-Area SWMUs are depicted on **Figures 6-5 through 6-10**. In accordance with the CMIWP (Arcadis 2017), the groundwater and porewater results for the TCE Area, A-Area, Beryllium, and C-Area SWMUs were compared against their respective numerical CAOs. Regional Screening Levels are not available for surface water for comparison with surface water analytical results.

6.1.1 TCE Area SWMU

Analytical results for the TCE Area SWMU are presented in **Table 6-1** and summarized below for each constituent that exceeded its numerical CAO at one or more sampling locations:

- Perchlorate was detected at concentrations exceeding its numerical CAO (14 µg/L) at 10 of the 21 performance monitoring wells during the March 2019 sampling event. The highest concentration occurred at GM-9M (570 µg/L). Detected concentrations in surface water ranged between an estimated value of 1.5 µg/L (SW6C) and 4.4 µg/L (SW6D). Perchlorate was detected at a concentration exceeding its numerical CAO at both porewater monitoring locations (PW6C and PW6D) at concentrations of 28 µg/L and 57 µg/L, respectively.
- 1,4-Dioxane concentrations in groundwater exceeded the numerical CAO (0.46 µg/L) at 13 of the 21 performance monitoring wells sampled during the March 2019 sampling event. The highest concentration occurred at monitoring well GM-21S (20 µg/L). 1,4-Dioxane exceeded its numerical CAO at one of the four surface water monitoring locations (SW6D), with a concentration of 1.6 µg/L. At both porewater monitoring locations PW6C (4.7 µg/L) and PW6D (3.7 µg/L), the concentration of 1,4-dioxane exceeded the numerical CAO.
- 1,1-dichloroethane (DCA) was detected in groundwater at concentrations exceeding its numerical CAO (2.7 µg/L) at seven of the 21 performance monitoring wells during the March 2019 sampling event. The highest concentration occurred at GM-9M (18 µg/L). 1,1-DCA was only detected at surface water monitoring location SW6D (1.1 µg/L) and 1,1-DCA was detected at both porewater monitoring locations at concentrations (3.5 µg/L) at PW6C and 2.1 µg/L at PW6D) that exceeded its numerical CAO.
- 1,1-DCE was detected at concentrations exceeding its numerical CAO (7 µg/L) at ten of the 21 performance monitoring wells during the March 2019 sampling event. The highest concentration

occurred at GM-22M (340 µg/L). 1,1-DCE concentrations in surface water samples ranged from non-detect to 16 ug/L (SW6D). 1,1-DCE was detected at a concentration above its numerical CAO at both porewater monitoring locations (PW6C and PW6D) at concentrations of 77 µg/L and 37 µg/L, respectively.

- cis-1,2-DCE was detected at concentrations exceeding its numerical CAO (70 µg/L) at two of the 21 performance monitoring wells during the March 2019 sampling event. These exceedances occurred at GM-14S (86 µg/L) and GM-16S (150 µg/L). Of the four surface water monitoring locations, cis-1,2-DCE was detected only at monitoring location SW6D (14 µg/L). cis-1,2-DCE concentrations were below the numerical CAO at both porewater monitoring locations.
- TCE was detected at concentrations exceeding its numerical CAO (5 µg/L) at 12 out of the 21 performance monitoring wells during the March 2019 sampling event. The highest concentration was observed at GM-22M (1,500 µg/L). TCE was detected at the four surface water monitoring locations with concentrations ranging from 3.8 µg/L (SW6B) to 24 µg/L (SW6D). TCE concentrations exceeded its numerical CAO at both porewater monitoring locations (PW6C - 370 µg/L, and PW6D - 160 µg/L).
- Vinyl chloride was detected at concentrations exceeding its numerical CAO (2 µg/L) at three of the 21 groundwater monitoring wells during the March 2019 sampling event. The highest concentration was observed at GM-14S (13 µg/L). It was detected at one of the four surface water monitoring locations (SW6D) at a concentration of 1.1 µg/L, and at one of the two porewater monitoring locations (PW6D) at a concentration of 2 µg/L.

6.1.2 A-Area SWMU

Groundwater analytical results for the A-Area SWMU are presented in **Table 6-2** and summarized below for each constituent that exceeded its numerical CAO at one or more monitoring wells. No surface water or porewater samples were collected for this area.

- Perchlorate concentrations exceeded the numerical CAO (14 µg/L) at both performance monitoring wells during the March 2019 sampling event. The highest concentration occurred at GM-1B (62 µg/L).
- 1,4-Dioxane concentration exceeded the numerical CAO (0.46 µg/L) at monitoring well GM-1B (3.7 µg/L).
- TCE was detected at both performance monitoring wells at a concentration exceeding the numerical CAO (5 µg/L) at monitoring well GM-1B (40 µg/L).

6.1.3 Beryllium SWMU

Analytical results for the Beryllium SWMU are presented in **Table 6-3**. No numerical CAOs for the Beryllium SWMU were established due to the nature of the closure of the Beryllium SWMU as waste-in-place and the demonstrated low potential for migration of hazardous waste or hazardous waste constituents from the SWMU via the shallow zone to water supply wells or to surface water. Groundwater samples exhibited detections of primarily metals; most of the semivolatile organic compounds and VOCs constituents were not detected.

6.1.4 C-Area SWMU

Analytical results for the C-Area SWMU are presented in **Table 6-4** and summarized below for each constituent that exceeded its numerical CAO at one or more monitoring wells.

- Perchlorate was detected at concentrations exceeding the numerical CAO (4 µg/L) at the 13 performance monitoring wells during the March 2019 sampling event with the highest concentration occurring at MW-29 (4,100 µg/L).
- 1,1-DCE was detected at concentrations exceeding its numerical CAO (7 µg/L) at six of the 13 performance monitoring wells. The highest concentration was observed at monitoring well MW-20 (29 µg/L).
- Chlorobenzene was detected at a concentration exceeding its numerical CAO (100 µg/L) at one performance monitoring wells (MW-13) with a concentration of 740 µg/L.
- PCE was detected at concentrations exceeding its numerical CAO (5 µg/L) at two of the 13 performance monitoring wells with the highest concentration occurring at monitoring well MW-5 (29 µg/L).
- TCE was detected at concentrations exceeding its numerical CAO (5 µg/L) at seven of the 13 performance monitoring wells with the highest concentration occurring at monitoring well MW-13 (350 µg/L).
- Vinyl chloride concentrations exceeded the numerical CAO (2 µg/L) at two of the 13 performance monitoring wells with the highest concentration occurring at monitoring well MW-20 (3.9 µg/L).

6.1.5 Pesticide SWMU AOC Cap

Performance monitoring of the Pesticide SWMU AOC was not performed during the March 2019 event because the remedy is presently under construction and is not yet completed. Performance monitoring of this area will be performed after the final remedy is completed and is anticipated to be presented in the next annual report.

6.2 Assessment of Institutional and Engineering Control Performance

Visual observations of fencing and signage around the Beryllium SWMU soil cover system indicate that the components of the IECs are present and performing as designed. Dense tree cover is present throughout the SWMU, and there are no signs of disturbance or trespassing in the area. Warning signs are visible, and fences are in good condition. Photos documenting the IEC verification at the Beryllium SWMU are presented in **Appendix G**. The Soil Management Plan along with modifications to the Site's dig permit system outlining procedures for subsurface soil excavation at the A-Area SWMU, Pesticide SWMU, and Beryllium SWMU was approved by the USEPA on April 17, 2018 and will be modified to include the C-Area SWMU in 2019**.** The Environmental Covenant for the Site will not be completed until the cap is in place and land use restrictions are recorded to incorporate the final Pesticide SWMU AOC surveyed coordinates.

6.3 Assessment of Remedial Action Performance

Chlorinated VOC and perchlorate concentration trends at monitoring well locations in the TCE Area, A-Area and C-Area SWMUs were evaluated using a Mann-Kendall analysis, which was performed using ProUCL version 5.1 software (USEPA 2016c), at sample locations with four or more data points. Trend plots and output from the statistical analysis are presented in **Appendix J**, and the results are summarized below. Historical data are presented in **Appendix I**. The Site's annual waste minimization certification is presented in **Appendix K**.

6.3.1 TCE Area SWMU

The sentinel wells in the TCE Area SWMU include GM-32 and GM-32D across Little Elk Creek in the intermediate and saprolite zones, GM-27 at the YMCA, and GM-31S/M in the off-site residential area south of U.S. Route 40. No constituents were detected above reporting limits at sentinel well GM31S/M, and 1,2,4-trimethylbenzene was the only constituent detected at GM-27 (1.5 µg/L), below its numerical CAO of 15 µg/L. Perchlorate, 1,1-dichloroethene, cis-1,2-dichloroethene, 1,4-dioxane, and trichloroethene were the only detected constituents observed at sentinel well GM-32 with the concentrations of 1,4-dioxane and trichloroethene exceeding their respective CAOs. Benzene and naphthalene were the only detected constituents observed at sentinel well GM-32D with the concentration of naphthalene (0.31 µg/L) exceeding its CAO (0.17 µg/L). These results indicate that off-site impacts are limited in their extent; temporal trends were not analyzed statistically for these sentinel wells as they either never contained detected concentrations of constituents or have been sampled fewer than five times. In comparison to the 2018 analytical results, concentrations of perchlorate, TCE, and 1,4-dioxane at GM-32 increased during the 2019 monitoring event. The TCE concentration increased from 16 µg/L to 25 µg/L, the 1,4-dioxane concentration increased from 0.25 µg/L (estimated value) to 0.91 µg/L, and the perchlorate concentration increased from 5.4 µg/L to 11 µg/L.

Location SW6B is upstream of the main TCE plume discharge area whereas locations SW6C/PW6C and SW6D/PW6D are downgradient to the plume core monitoring wells GM-22S/M and GM-21S/M, respectively. Location SW7B represents off-site conditions downstream of the plume discharge area. TCE and perchlorate concentrations at the downgradient surface water locations SW6C and SW7B are similar, and SW6D had the highest observed TCE concentration of the surface water samples (24 µg/L). All surface water samples exhibited concentrations that were more than an order of magnitude lower than those measured in the plume core monitoring wells GM-21S/M and GM-22S/M. Similarly, the TCE concentration in porewater at location PW6D are over 6-fold lower (1100 µg/L at GM-21S and 160 µg/L at PW6D) than those in the closest plume core monitoring well GM-21S. The TCE concentration observed at PW6D has increased by more than an order of magnitude since 2018, and the TCE concentration observed at SW6D has increased about 4-fold since 2018, while TCE concentrations at GM-21S and GM-22S/M have remained stable. This is evidence that the plume is migrating toward Little Elk Creek following the groundwater flow path toward the south east. At the porewater sampling location PW6C, perchlorate and TCE concentrations are 2-fold and over 3-fold lower than groundwater concentration of these COCs at the closest plume core monitoring wells GM-22S and GM-22M, respectively. These results are indicative of natural attenuation of TCE and perchlorate along the flow path in the creek.

Groundwater geochemical results indicate that generally aerobic or mildly reducing conditions are present in the TCE Area SWMU, with more reducing conditions expected near Little Elk Creek where higher

concentrations of TOC are observed. The potential for pockets of reducing conditions and limited anaerobic biodegradation exists in discrete locations upgradient (such as GM-2B) where isolated layers of material with high organic carbon occur. At such locations, detections of the TCE daughter product cis-1,2-DCE provide an additional line of evidence of natural attenuation. Conditions conducive to biodegradation of perchlorate and TCE under reducing conditions are found close to Little Elk Creek due to the increased availability of reduced carbon near the creek. Concentrations of perchlorate and TCE have both decreased to below their respective CAOs at GM-30M since the 2018 sampling. At GM-14M, concentrations of perchlorate, TCE, 1,1-dichloroethene and vinyl chloride have increased to above their respective CAOs from 2018 to 2019.

Statistical trend analysis of historic data (**Appendix J**) and current and historical data presented in **Appendix I** shows that concentrations of VOCs and perchlorate are stable-to-declining at most performance monitoring wells in the TCE Area SWMU. Specifically, TCE concentrations exhibited declining trends in plume-core wells GM-2B, GM-14M, GM-14S, GM-22M, and plume periphery well GM-16M, while no statistical trend was present for plume-core wells GM-21S/M, and GM-22S. The only increasing trends were observed for TCE and perchlorate at the plume periphery well GM-16S, plume core monitoring well GM-21M (perchlorate only) and sentinel well GM-32 (TCE only), suggesting continued migration of the plume centroid along the groundwater flow path toward Little Elk Creek. Perchlorate concentrations demonstrated decreasing trends at plume-core wells GM-24 and GM-22S, while no statistical trend was present at plume-core wells GM-21S/M, GM-22M, and GM-14M. These results along with detections of TCE and 1,1,1-TCA daughter products provide multiple lines of evidence of a generally stable or shrinking plume due to natural attenuation via abiotic or biological degradation pathways.

6.3.2 A-Area SWMU

Groundwater from the A-Area SWMU generally flows into the TCE Area SWMU and northeast toward Little Elk Creek. Both monitoring wells GM-1B and GM-15M represent plume-core wells and GM-1B exhibits mildly aerobic conditions based on the geochemical data obtained during the March 2019 event. However, the presence of TCE and 1,1,1-TCA daughter products suggest microenvironments may be present where reducing conditions are conducive to biodegradation of these COCs. The TCE concentration demonstrated decreasing trends at GM-1B, and comparing the March 2019 event results to those from March 2004 and November 2002 events indicates that the TCE concentration has declined by almost 4-fold (from 170 µg/L to 40 µg/L) at monitoring well GM-1B whereas it has stayed stable at monitoring well GM-15M, remaining below the CAO of 5 µg/L. Perchlorate concentrations do not exhibit a statistically significant trend at monitoring well GM-1B, whereas they have declined by over 5-fold at location GM-15M. These results are indicative of ongoing natural attenuation process in the A-Area SWMU.

6.3.3 C-Area SWMU

The remedial system consisting of a groundwater interceptor trench and infiltration gallery with an air stripper system has resulted in containment of high VOC concentration areas and significant declines in VOC concentrations in the vicinity of the system since its operation began in 1993. Evaluation of the implemented CAs has continued under MDE CHS Permit MDD A-052. The 13 shallow groundwater wells

used for performance monitoring were selected to allow for continued documentation of changes to plume size and shape.

Statistical trend analysis of past and current data indicates that VOC concentrations exhibit a stable-to-declining trend at most of the 13 performance monitoring wells. Specifically, both TCE and 1,1,1-TCA have decreased at wells MW-1, MW-2, MW-5, MW-10, MW-12, MW-13, MW-19, MW-20, MW-23, MW-25, MW-28, and MW-29. Additionally, PCE concentrations showed decreasing trends at MW-1, MW-2, MW-10, MW-19, MW-20, MW-25, MW-28, and MW-29, and perchlorate concentrations showed decreasing trends at MW-1, MW-2, MW-5, MW-12, MW-13, MW-19, MW-23, MW-25, and MW-29. The only statistically significant increasing trends were observed for PCE at wells MW-5, 1,1,2-TCA at MW-29, 1,1-DCE at MW-22, chlorobenzene at MW-13, chloroform at MW-23, perchlorate at MW-10, dichloromethane at MW-29, and vinyl chloride at MW-20 and MW-29. Overall, these trends are indicative of a shrinking plume as a result of continued operation of the active treatment system, and support the transition from semi-annual to annual performance monitoring for this area. Geochemical conditions in the C-Area SWMU are aerobic and oxidizing suggesting that aerobic or abiotic attenuation may be occurring in areas upgradient of the treatment system.

7 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the performance monitoring and statistical trend analysis of past and current data, even though some COCs exhibited exceedances of their numerical CAOs at certain monitoring locations during the March 2019 sampling event, overall COC trends demonstrate groundwater quality improvements. Many COCs continue to exhibit stable-to-decreasing concentrations in the TCE Area, A-Area, and C-Area SWMUs, providing evidence of stable or shrinking plumes.

Natural attenuation is ongoing in the TCE Area and A-Area SWMUs as demonstrated by decreasing concentrations of perchlorate and TCE at most of the wells. This attenuation may be attributed to reductive dechlorination due to the presence of daughter products at certain locations in the TCE Area SWMU while for other locations it may be as a result of abiotic or aerobic degradation. Based on the results of the porewater and surface water samples collected from Little Elk Creek, lower concentrations of TCE and perchlorate are discharging to Little Elk Creek than observed upgradient and natural attenuation of TCE and perchlorate appears to be occurring along the flow path of the creek. The off-site impacts from the TCE Area SWMU appear to be limited in aerial extent and are not indicative of worsening environmental conditions that would require additional actions.

The active treatment system in the C-Area SWMU appears to be operating as designed to achieve containment of high VOC areas and a reduction in VOC concentrations. The IECs at the Beryllium SWMU are operating as designed, and the integrity of the vegetative cover has been maintained. Groundwater use and soil excavation restrictions continue to remain protective of human health. For the third year of CMI, changes in the performance monitoring program are not currently recommended.

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TABLES

Table 4-1
Summary of Numerical CAOs for Groundwater for TCE Area and A-Area SWMUs
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

COC	CAO (MCL) (µg/L)
1,1,1-Trichloroethane	200
1,1-Dichloroethane	2.7*
1,1-Dichloroethene	7
1,2,4-Trimethylbenzene	15*
1,4-Dioxane	0.46*
Benzene	5
cis-1,2-Dichloroethylene	70
Naphthalene	0.17*
Perchlorate	14*
Trichloroethylene	5
Vinyl chloride	2

*RSL value indicated is the numerical CAO for COCs without an associated MCL.

(USEPA 2017a, 2017b)

Notes:
CAO - Corrective Action Objective
COC - constituent of concern
MCL - maximum contaminant level
RSL - Regional Screening Level
µg/L - microgram per liter

Table 4-2
Summary of Numerical CAOs for Groundwater
for C-Area SWMU
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

COC	CAO (MCL) (µg/L)
Benzene	5
Chlorobenzene	100
Chloroform	80
Carbon tetrachloride	5
1,2-Dichloroethane	5
1,1-Dichloroethene	7
Methylene chloride	5
Perchlorate	4.0*
PCE	5
1,1,1-Trichloroethane	200
1,1,2-Trichloroethane	5
Trichloroethylene	5
Vinyl chloride	2

* The perchlorate concentration of 4.0 µg/L is not a groundwater protection standard but is a concentration limit requirement of MDE CHS Permit MDD A-052.

Notes:
CAO - Corrective Action Objective
CHS - Controlled Hazardous Substances
COC - contaminant of concern
MCL - maximum contaminant level
MDE - Maryland Department of the Environment
µg/L - microgram per liter

Table 5-1
Performance Monitoring Program
Alliant Techsystems Operations LLC
Elkton, Maryland

Monitoring Well / Sample Location ID	Sampling Frequency	Analytical Parameters	Location Description	Rationale
Upstream Surface Water				
SW1C	Annual	VOCs, SVOCs, perchlorate, metals	Little Elk Creek	Surface water quality upstream of Site
TCE Area SWMU				
GM-2B	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	Crouse Bros. property	Plume Core
GM-4B	Annual	VOCs, 1,4-dioxane, perchlorate	Northeast TCE Area near Little Elk Creek	Downgradient from A-Area
GM-9M	Annual	VOCs, 1,4-dioxane, perchlorate	Northwest TCE Area	Flow component to north
GM-10S	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	Northwest TCE Area	Flow component to north
GM-14S	Annual	VOCs, 1,4-dioxane, perchlorate	Southern property boundary	Plume Core
GM-14M	Annual	VOCs, 1,4-dioxane, perchlorate sulfate, TOC, dissolved iron	Southern property boundary	Plume Core
GM-16S	Annual	VOCs, 1,4-dioxane, perchlorate	South of U.S. Route 40 near Little Elk Creek	Plume Periphery
GM-16M	Annual	VOCs, 1,4-dioxane, perchlorate	South of U.S. Route 40 near Little Elk Creek	Plume Periphery
GM-21S	Annual	VOCs, 1,4-dioxane, perchlorate	Adjacent to Little Elk Creek	Downgradient plume core, groundwater discharge area
GM-21M	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	Adjacent to Little Elk Creek	Downgradient plume core, groundwater discharge area
GM-22S	Annual	VOCs, 1,4-dioxane, perchlorate	Adjacent to Little Elk Creek	Downgradient plume core, groundwater discharge area
GM-22M	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	Adjacent to Little Elk Creek	Downgradient plume core, groundwater discharge area
GM-24	Annual	VOCs, 1,4-dioxane, perchlorate	Western TCE Area	Upgradient plume core
GM-26S	Annual	VOCs, 1,4-dioxane, perchlorate	South of U.S. Route 40	Off-axis, bounds 1,4-dioxane exceedances
GM-26M	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	South of U.S. Route 40	Off-axis, bounds 1,4-dioxane exceedances
GM-27	Annual	VOCs, 1,4-dioxane, perchlorate	YMCA property	Sentinel well
GM-30M	Annual	VOCs, 1,4-dioxane, perchlorate	South of U.S. Route 40	Plume Periphery, bounds perchlorate exceedances
GM-31S	Annual	VOCs, 1,4-dioxane, perchlorate	Residential Area, South of U.S. Route 40	Sentinel well
GM-31M	Annual	VOCs, 1,4-dioxane, perchlorate	Residential Area, South of U.S. Route 40	Sentinel well
GM-32	Annual	VOCs, 1,4-dioxane, perchlorate	Eastern TCE Area across Little Elk Creek	Sentinel well across creek in groundwater discharge area, low TCE detections
GM-32D	Annual	VOCs, 1,4-dioxane, perchlorate	Eastern TCE Area across Little Elk Creek	Sentinel well across creek in groundwater discharge area
PW6C	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved Iron	Little Elk Creek at TCE plume discharge location	Assess discharge to surface water
PW6D	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved Iron	Little Elk Creek at TCE plume discharge location	Assess discharge to surface water
SW6B	Annual	VOCs, 1,4-dioxane, perchlorate	Little Elk Creek upstream of TCE plume discharge area	Surface water quality upstream of TCE plume discharge area
SW6C	Annual	VOCs, 1,4-dioxane, perchlorate	Little Elk Creek at TCE plume discharge location	Surface water quality at TCE plume discharge area
SW6D	Annual	VOCs, 1,4-dioxane, perchlorate	Little Elk Creek at TCE plume discharge location	Surface water quality at TCE plume discharge area
SW7B	Annual	VOCs, 1,4-dioxane, perchlorate	Little Elk Creek downstream from property boundary	Surface water quality downstream of Site boundary
A-Area SWMU				
GM-1B	Annual	VOCs, 1,4-dioxane, perchlorate, sulfate, TOC, dissolved iron	A-Area	Plume Core
GM-15M	Annual	VOCs, perchlorate	Northeast of A-Area	Plume Core
Beryllium SWMU				
BS-1	Annual	VOCs, SVOCs, perchlorate, metals, sulfate, TOC, dissolved iron	Between Beryllium SWMU and Little Elk Creek	Plume axis, downgradient of waste in place
PW2B	Annual	VOCs, SVOCs, perchlorate, metals, sulfate, TOC, dissolved iron	Little Elk Creek	Assess discharge to surface water
SW2B	Annual	VOCs, SVOCs, perchlorate, metals	Little Elk Creek	Surface water quality in potential discharge area
Pesticide SWMU AOC				
MW-5	Biennial	Pesticides	Northeast of Pesticide SWMU AOC Cap	Downgradient of Cap
MW-6	Biennial	Pesticides	West of Pesticide SWMU AOC Cap	Upgradient of Cap
C-Area SWMU				
MW-1	Annual	VOCs, perchlorate	Eastern C-Area	Former Source Area
MW-2	Annual	VOCs, perchlorate, sulfate, TOC, dissolved iron	Eastern C-Area	Former Source Area
MW-5	Annual	VOCs, perchlorate	Central C-Area	Plume axis
MW-10	Annual	VOCs, perchlorate	Southern C-Area	Plume periphery
MW-11[(2)]	Annual	TKN, TN, Nitrate-N	Eastern C-Area	Former Source Area
MW-12	Annual	VOCs, perchlorate sulfate, TOC, dissolved iron	Eastern C-Area	Former Source Area
MW-13	Annual	VOCs, perchlorate	Eastern C-Area	Upgradient Infiltration Gallery Area
MW-19	Annual	VOCs, perchlorate	Central C-Area	Plume axis
MW-20	Annual	VOCs, perchlorate, TKN, TN, Nitrate-N	Central C-Area	Plume axis
MW-22	Annual	VOCs, perchlorate, sulfate, TOC, dissolved iron, TKN, TN, Nitrate-N	Northern C-Area	Plume axis
MW-23	Annual	VOCs, perchlorate	Southern C-Area	Plume periphery
MW-25	Annual	VOCs, perchlorate, sulfate, TOC, dissolved iron	Southern C-Area	Plume periphery
MW-28	Annual	VOCs, perchlorate, sulfate, TOC, dissolved iron	Western C-Area	Downgradient
MW-29	Annual	VOCs, perchlorate	Western C-Area	Downgradient

Notes:

AOC - area of concern
SVOC - semivolatile organic compound
SWMU - Solid Waste Management Unit
TCE - trichloroethene
TKN - total Kjeldahl nitrogen; TN - total nitrogen
TN - total nitrogen
TOC - total organic carbon
VOC - volatile organic compound
* - top and bottom screen elevations for wells GM-22S, GM-22M, GM-24, GM-26S, and GM-26M approximated assuming a 3 ft stickup casing
[(2)] This well was not part of the PMP but monitored to comply with the requirement of the MDE CHS permit.

Table 5-2
Well Specifications, Sampling Location Coordinates, and Groundwater Specifications
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

Monitoring Well / Sample Location ID	Hydrogeologic Unit	NAD83 Easting (State Planar) (ft)	NAD83 Northing (State Planar) (ft)	Top of Casing Elevation (ft msl)	Well Depth (ft bgs)	Screen Length (ft)	Top of Screen Elevation* (ft msl)	Bottom of Screen Elevation* (ft msl)	GW Elevation (March 2019) (ft msl)
Upstream Surface Water									
SW-1C	Surface Water	1632222.29	716416.25	N/A	N/A	N/A	N/A	N/A	--
TCE Area SWMU									
GM-2B	Intermediate	1634423.11	709166.75	19.33	76.15	10	-46.26	-56.26	-8.40
GM-4B	Intermediate	1634973.19	711463.74	21.69	48.92	10	-19.20	-29.20	15.54
GM-9M	Intermediate	1632227.74	711360.49	38.71	58.52	10	-10.71	-20.71	21.45
GM-10S	Shallow	1632291.65	712034.88	30.9	17.93	10	21.23	11.23	20.96
GM-14S	Shallow	1634030.47	709256.58	45.78	65.00	20	-2.82	-22.82	15.31
GM-14M	Intermediate	1634023.76	709262.99	45	107.29	30	-35.04	-65.04	16.94
GM-16S	Shallow	1635707.78	708522.11	11.75	32.17	10	-11.93	-21.93	11.75
GM-16M	Intermediate	1635731.12	708506.21	12.33	71.53	20	-43.32	-63.32	12.33
GM-21S	Shallow	1636453.25	708807.75	9.90	25	10	-7.10	-17.10	5.93
GM-21M	Intermediate	1636443.63	708797.69	9.74	52	15	-27.26	-42.26	7.88
GM-22S	Shallow	1636747.69	709300.10	12.43	20	10	0.43	-9.57	4.86
GM-22M	Intermediate	1636744.78	709283.63	12.33	37	15	-11.67	-26.67	6.45
GM-24	Intermediate	1633351.88	709510.80	50.70	96	15	-32.30	-47.30	17.62
GM-26S	Shallow	1634171.11	708685.18	45.72	60	10	-6.28	-16.28	38.15
GM-26M	Intermediate	1634190.65	708692.18	45.58	90	15	-31.42	-46.42	12.60
GM-27	Shallow	1635597.63	709393.74	24.51	18	10	16.51	6.51	16.49
GM-30M	Intermediate	1634741.54	708270.55	43.47	86	10	-32.53	-42.53	33.61
GM-31S	Shallow	1633419.17	707813.46	35.17	14	10	31.17	21.17	32.12
GM-31M	Intermediate	1633419.17	707809.02	34.88	90	10	-45.12	-55.12	13.80
GM-32	Intermediate	1636806.46	708965.62	12.08	30	10	-7.95	-17.95	6.44
GM-32D	Saprolite	1636802.60	708961.50	12.01	58	15	-30.59	-45.59	6.71
PW6C	Pore Water	1636937.36	709550.68	N/A	N/A	N/A	N/A	N/A	--
PW6D	Pore Water	1636592.73	708821.04	N/A	N/A	N/A	N/A	N/A	--
SW6B	Surface Water	1636977.94	709715.17	N/A	N/A	N/A	N/A	N/A	--
SW6C	Surface Water	1636934.08	709550.68	N/A	N/A	N/A	N/A	N/A	--
SW6D	Surface Water	1636611.57	708801.97	N/A	N/A	N/A	N/A	N/A	--
SW7B	Surface Water	1636041.13	707866.55	N/A	N/A	N/A	N/A	N/A	--
A-Area SWMU									
GM-1B	Intermediate	1633544.314	710460.4979	33.85	51.52	10	-7.91	-17.91	19.05
GM-15M	Intermediate	1634335.403	711059.0121	30.23	46.83	10	-6.17	-16.17	18.62

Table 5-2
Well Specifications, Sampling Location Coordinates, and Groundwater Specifications
Alliant Techsystems Operations LLC
Elkton, Maryland

Monitoring Well / Sample Location ID	Hydrogeologic Unit	NAD83 Easting (State Planar) (ft)	NAD83 Northing (State Planar) (ft)	Top of Casing Elevation (ft msl)	Well Depth (ft bgs)	Screen Length (ft)	Top of Screen Elevation* (ft msl)	Bottom of Screen Elevation* (ft msl)	GW Elevation (March 2019) (ft msl)
Beryllium SWMU									
BS-1	Shallow	1632120.52	715108.40	46.46	17.00	10	39.46	29.46	38.79
PW2B	Pore Water	1632083.02	715185.31	N/A	N/A	N/A	N/A	N/A	--
SW2B	Surface Water	1632083.02	715185.31	N/A	N/A	N/A	N/A	N/A	--
C-Area SWMU									
MW-1	Shallow	1631613.60	713900.99	42.85	7.05	5.00	32.66	27.66	37.41
MW-2	Shallow	1631642.63	713924.61	42.43	6.36	5.00	33.98	28.98	37.54
MW-5	Shallow	1631566.89	714083.79	41.16	6.94	8.00	37.46	29.46	35.49
MW-10	Shallow	1631539.05	713708.94	41.88	15.51	10.00	34.84	24.84	36.54
MW-11[(2)]	Shallow	1631253.54	713853.65	39.63	12.00	10.00	35.07	25.07	35.33
MW-12	Shallow	1631495.77	713885.25	40.48	9.10	5.00	34.14	29.14	36.35
MW-13	Shallow	1631766.52	713963.45	42.53	9.40	10.00	36.73	26.73	38.01
MW-19	Shallow	1631070.66	713810.22	39.66	12.81	10.00	34.69	24.69	34.04
MW-20	Shallow	1631277.04	713978.91	40.17	12.17	10.00	34.65	24.65	34.94
MW-22	Shallow	1631489.11	714187.13	41.99	13.50	11.00	36.56	25.56	34.97
MW-23	Shallow	1631268.89	713158.02	41.74	13.19	11.00	35.97	24.97	34.39
MW-25	Shallow	1630993.09	713457.24	39.49	11.86	10.00	34.42	24.42	34.46
MW-28	Shallow	1630799.76	713738.58	39.55	13.53	10.00	33.26	23.26	33.99
MW-29	Shallow	1630790.30	713869.69	40.13	13.93	10.00	34.30	24.30	33.71

Notes:
AOC - area of concern
bgs - below ground surface
CHS - Controlled Hazardous Substances
ft - foot/feet
MDE - Maryland Department of Environment
msl - mean sea level
N/A - not applicable
SWMU - solid waste management unit
-- - not analyzed or measured
* - top and bottom screen elevations for wells GM-22S, GM-22M, GM-24, GM-26S, and GM-26M approximated assuming a 3 ft stickup casing
(1) Site coordinate system used for the Pesticide SWMU AOC investigations
(2) This well was not part of the PMP but monitored to comply with the requirement of the MDE CHS permit.

Table 5-3
List of Abandoned Wells
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

Well ID
GM-1S
GM-1A
GM-12M
GM-18D
GM-18S
GM-19
GM-14D
GM-10M
GM-10D
GM9D
GM9M*
GM-12S
GM-12D
GM-20S
GM-20D
GM-23M
GM-23S
GM-30S
GM-29
GM28
GM-11S
GM-11D
GM-11M
GM-13D
GM-13S
GM-13M
GM-3A
GM-3B
GM-17

Notes:
Wells were abandoned between 7/17/2019 and 7/26/2019
* GM-9M is part of the performance monitoring program. As of the date of this report, Arcadis is in the process of verifying whether this well was abandoned in error. GM-9S had been slated for abandonment.

Table 6-1
TCE Area SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

		Matrix	Groundwater										
		Location ID:	GM-2B	GM-4B	GM-9M	GM-10S	GM-14M	GM-14S	GM-16M	GM-16S	DUP-04 (GM-21M	GM-21M	GM-21S
		Sample Date:	3/26/2019	3/19/2019	3/20/2019	3/20/2019	3/19/2019	3/19/2019	3/26/2019	3/26/2019	3/25/2019	3/25/2019	3/25/2019
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	µg/L	14	< 1.0 U	**1.4**	**570**	**4.2**	**96**	< 1.0 U	< 1.0 U	**280**	**210**	**220**	**64**
SVOCs SIM													
1,4-Dioxane	µg/L	0.46	**1.4**	< 0.40 U	**8.3**	**0.89**	**4.7**	**9.8**	**0.18 J**	**15**	**3.6**	**3.1**	**20**
Naphthalene	µg/L	0.17	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 1.0 U
VOCs													
1,1,1-Trichloroethane	µg/L	200	< 1.0 U	< 1.0 U	**8**	< 1.0 U	**4.5**	**1.6**	< 1.0 U	**30**	< 1.0 U	**2.7**	**72**
1,1-Dichloroethane	µg/L	2.7	< 1.0 U	< 1.0 U	**18**	**0.88 J**	**5.1**	**9.2**	< 1.0 U	**11**	**0.92 J**	**0.81 J**	**9.3 J**
1,1-Dichloroethene	µg/L	7	< 1.0 U	< 1.0 U	**52**	**6.3**	**28**	**27**	< 1.0 U	**100**	**14**	**15**	**210**
1,2,4-Trimethylbenzene	µg/L	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 10 U
Benzene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 10 U
cis-1,2-Dichloroethene	µg/L	70	**4.6**	< 1.0 U	**2.6**	< 1.0 U	**40**	**86**	< 1.0 U	**150**	**4**	**4.1**	**23**
Trichloroethene	µg/L	5	< 1.0 U	**13**	**120**	**3**	**270**	**8.4**	**2.1**	**740**	**190**	**190**	**1100**
Vinyl chloride	µg/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.4**	**13**	< 1.0 U	**12**	< 1.0 U	< 1.0 U	< 10 U
Water Quality Parameters													
Dissolved Oxygen	mg/L	--	0	4.93	0	1.34	0	1.26	0	0	--	2.31	0
Oxidation Reduction Potential	mV	--	-218	209	261	313	187	38	22	323	--	290	391
Specific Conductivity	µS/cm	--	0.251	0.292	0.071	0.115	0.142	0.304	0.109	0.104	--	0.037	0.076
Temperature	°C	--	13.79	11.9	11.79	9.98	13.7	12.9	9.24	11.2	--	10.18	10.67
pH	S.U.	--	7.63	5.99	5.19	5.3	6.36	5.53	6.2	4.65	--	4.52	4.15
Monitored Natural Attenuation Parameters													
Sulfate	mg/L	--	**3.4**	--	--	**10**	**8.5**	--	--	--	**1.3**	**1.3**	--
Dissolved Iron	µg/L	--	**26000**	--	--	**18 J**	**130**	--	--	--	**150**	**150**	--
Total Organic Carbon	mg/L	--	**8.8**	--	--	**0.65 J**	**1.2**	--	--	--	< 1.0 U	< 1.0 U	--

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

°C - degrees Celsius
CAO - corrective action objective
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
SIM - selective ion monitoring
S.U. - standard units
SVOC - semi-volatile organic compound
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-1
TCE Area SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

		Matrix										
		Location ID:	GM-22M	GM-22S	GM-24	GM-26M	GM-26S	GM-27	GM-30M	DUP-05 (GM-31M	GM-31M	GM-31S	GM-32
		Sample Date:	3/25/2019	3/25/2019	3/19/2019	3/26/2019	3/26/2019	3/21/2019	3/26/2019	3/26/2019	3/26/2019	3/26/2019	3/25/2019
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	µg/L	14	**71**	**61**	**130**	**96**	**110**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**11**
SVOCs SIM													
1,4-Dioxane	µg/L	0.46	**16**	**13**	< 0.40 U	**2.6**	**2.1**	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	< 0.40 U	**0.91**
Naphthalene	µg/L	0.17	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
VOCs													
1,1,1-Trichloroethane	µg/L	200	**150**	**95**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	µg/L	2.7	**14**	**11**	< 1.0 U	**0.67 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	µg/L	7	**340**	**270**	**2**	**10**	**8.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.4**
1,2,4-Trimethylbenzene	µg/L	15	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	µg/L	5	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	µg/L	70	**26**	**20**	< 1.0 U	**4.9**	**5.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.6**
Trichloroethene	µg/L	5	**1500**	**1200**	**20**	**180**	**150**	< 1.0 U	**0.70 J**	< 1.0 U	< 1.0 U	< 1.0 U	**25**
Vinyl chloride	µg/L	2	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Water Quality Parameters													
Dissolved Oxygen	mg/L	--	0	0	1.14	4.08	0	2.92	0	--	2.18	0	3.97
Oxidation Reduction Potential	mV	--	303	330	305	337	359	327	259	--	183	119	267
Specific Conductivity	µS/cm	--	0.229	0.446	0.069	0.051	0.065	0.587	1.12	--	0.068	0.253	0.03
Temperature	°C	--	14.02	13.87	13.19	11.88	10.8	9.98	11.65	--	13.86	10.29	11.16
pH	S.U.	--	4.96	4.77	4.96	4.81	4.74	5.21	5.89	--	6.42	6.93	5.3
Monitored Natural Attenuation Parameters													
Sulfate	mg/L	--	**8.2**	--	--	**1.8**	--	--	--	--	--	--	--
Dissolved Iron	µg/L	--	< 50 U	--	--	< 50 U	--	--	--	--	--	--	--
Total Organic Carbon	mg/L	--	**0.63 J**	--	--	**0.62 J**	--	--	--	--	--	--	--

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

°C - degrees Celsius
CAO - corrective action objective
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
SIM - selective ion monitoring
S.U. - standard units
SVOC - semi-volatile organic compound
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-1
TCE Area SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix		Pore Water		Surface Water			
		Location ID:	GM-32D	PW-06C	PW-06D	SW-6B	SW-6C	SW-6D	SW-7B
		Sample Date:	3/25/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019
Analyte	**Units**	**CAO**							
Anions									
Perchlorate	µg/L	14	< 1.0 U	**28**	**57**	**1.6**	**1.5**	**4.4**	**2**
SVOCs SIM									
1,4-Dioxane	µg/L	0.46	< 0.40 U	**4.7**	**3.7**	< 0.40 U	< 0.40 U	**1.6**	< 0.40 U
Naphthalene	µg/L	0.17	**0.31**	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U
VOCs									
1,1,1-Trichloroethane	µg/L	200	< 1.0 U	**27**	**11**	< 1.0 U	< 1.0 U	**5.4**	< 1.0 U
1,1-Dichloroethane	µg/L	2.7	< 1.0 U	**3.5**	**2.1**	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U
1,1-Dichloroethene	µg/L	7	< 1.0 U	**77**	**37**	< 1.0 U	< 1.0 U	**16**	< 1.0 U
1,2,4-Trimethylbenzene	µg/L	15	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	µg/L	5	**0.68 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	µg/L	70	< 1.0 U	**8.1**	**8.3**	< 1.0 U	< 1.0 U	**14**	< 1.0 U
Trichloroethene	µg/L	5	< 1.0 U	**370**	**160**	**3.8**	**4.6**	**24**	**4.7**
Vinyl chloride	µg/L	2	< 1.0 U	< 1.0 U	**2**	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U
Water Quality Parameters									
Dissolved Oxygen	mg/L	--	0.02	9.36	8.99	--	9.36	8.99	9.84
Oxidation Reduction Potential	mV	--	-64	--	--	--	--	--	--
Specific Conductivity	µS/cm	--	0.142	0.196	0.222	--	0.196	0.222	0.197
Temperature	°C	--	11.84	6.27	7.19	--	6.27	7.19	7.6
pH	S.U.	--	6.07	7.12	7.21	--	7.12	7.21	7.35
Monitored Natural Attenuation Parameters									
Sulfate	mg/L	--	--	**17**	**15**	--	--	--	--
Dissolved Iron	µg/L	--	--	< 50 U	**270**	--	--	--	--
Total Organic Carbon	mg/L	--	--	**2**	**1.1**	--	--	--	--

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

°C - degrees Celsius
CAO - corrective action objective
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
SIM - selective ion monitoring
S.U. - standard units
SVOC - semi-volatile organic compound
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-2
A-Area SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

	Matrix:	Groundwater		
	Location ID:	DUP-01 (GM-15M	GM-15M	GM-1B
	Sample Date:	3/19/2019	3/19/2019	3/19/2019
Analyte	Units	CAO	Result		
Anions					
Perchlorate	µg/L	14	**43**	**44**	**62**
SVOCs SIM					
1,4-Dioxane	µg/L	0.46	--	--	**3.7**
Naphthalene	µg/L	0.17	--	--	< 0.20 U
VOCs					
1,1,1-Trichloroethane	µg/L	200	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	µg/L	2.7	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	µg/L	7	< 1.0 U	< 1.0 U	**1.8**
1,2,4-Trimethylbenzene	µg/L	15	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	µg/L	70	**0.56 J**	**0.67 J**	**1.6**
Trichloroethene	µg/L	5	**4.4**	**4.5**	**40**
Vinyl chloride	µg/L	2	< 1.0 U	< 1.0 U	< 1.0 U
Water Quality Parameters					
Dissolved Oxygen	mg/L	--	--	0	0.39
Oxidation Reduction Potential	mV	--	--	264	84
Specific Conductivity	µS/cm	--	--	0.127	0.116
Temperature	°C	--	--	12.22	11.9
pH	S.U.	--	--	5.72	10.6
Monitored Natural Attenuation Parameters					
Sulfate	mg/L	--	--	--	**2.1**
Dissolved Iron	µg/L	--	--	--	< 50 U
Total Organic Carbon	mg/L	--	--	--	**0.760 J**

Notes:
1. Values exceeding laboratory reporting limits are bolded. Values exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.

°C - degrees Celsius
CAO - corrective action objective
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
SIM - selective ion monitoring
S.U. - standard units
SVOC - semi-volatile organic compound
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-3
Beryllium SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

	Matrix:	Groundwater	Pore Water	Surface Water	
	Location ID:	BS-1	PW-02B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/22/2019	3/27/2019	3/27/2019	3/27/2019
Analyte	**Units**				
Anions					
Perchlorate	µg/L	< 1.0 U	**0.42 J**	**0.83 J**	**0.80 J**
Sulfate	µg/L	**1200**	**9900**	--	--
Metals					
Aluminum	µg/L	**320**	**2000**	**58 J**	**55 J**
Antimony	µg/L	< 20 U	< 20 U	< 20 U	< 20 U
Arsenic	µg/L	< 20 U	< 20 U	< 20 U	< 20 U
Barium	µg/L	**21**	**64**	**36**	**36**
Beryllium	µg/L	< 4.0 U	**0.16 J**	< 4.0 U	< 4.0 U
Cadmium	µg/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Calcium	µg/L	**35000**	**7800**	**13000**	**13000**
Chromium	µg/L	**3.0 J**	**12**	< 10 U	< 10 U
Cobalt	µg/L	**2.7 J**	**12**	< 10 U	< 10 U
Copper	µg/L	**6.5 JB**	**3.4 J**	< 20 U	< 20 U
Iron	µg/L	**200**	**9900**	--	--
Iron (filtered)	µg/L	**1800**	**12000**	**160**	**140**
Lead	µg/L	< 10 U	**7.8 J**	**5.3 J**	< 10 U
Magnesium	µg/L	**10000**	**5100**	**8200**	**8000**
Manganese	µg/L	**230**	**820**	**31**	**30**
Mercury	µg/L	< 0.20 U	**0.12 JB**	**0.084 JB**	< 0.20 U
Nickel	µg/L	**5.5 J**	**21 J**	**3.1 J**	< 40 U
Potassium	µg/L	**1100**	**900 J**	**2100**	**2000**
Selenium	µg/L	< 20 U	< 20 U	< 20 U	< 20 U
Silver	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
Sodium	µg/L	**24000**	**12000**	**15000**	**15000**
Thallium	µg/L	< 25 U	< 25 U	< 25 U	< 25 U
Vanadium	µg/L	**2.4 J**	**5.1 J**	< 10 U	< 10 U
Zinc	µg/L	**7.3 J**	**28**	< 20 U	< 20 U
SVOCs					
1,1-Biphenyl	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
1,2,4-Trichlorobenzene	µg/L	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,2-Dichlorobenzene	µg/L	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,3-Dichlorobenzene	µg/L	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,4-Dichlorobenzene	µg/L	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
2,2-Oxybis(1-Chloropropane)	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,4,5-Trichlorophenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,4,6-Trichlorophenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,4-Dichlorophenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,4-Dimethylphenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,4-Dinitrophenol	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
2,4-Dinitrotoluene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2,6-Dinitrotoluene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2-Chloronaphthalene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2-Chlorophenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2-Methyl-4,6-dinitrophenol	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
2-Methylnaphthalene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2-Methylphenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
2-Nitroaniline	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
2-Nitrophenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
3,3-Dichlorobenzidine	µg/L	< 58 U	< 60 U	< 58 U	< 59 U

Table 6-3
Beryllium SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

	Matrix:	Groundwater	Pore Water	Surface Water	
	Location ID:	BS-1	PW-02B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/22/2019	3/27/2019	3/27/2019	3/27/2019
Analyte	Units				
3-Nitroaniline	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
4-Bromophenyl phenyl ether	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
4-Chloro-3-Methylphenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
4-Chlorophenyl phenyl ether	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
4-Methylphenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
4-Nitroaniline	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
4-Nitrophenol	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
Acenaphthene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Acenaphthylene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Acetophenone	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Anthracene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Atrazine	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzaldehyde	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzo(a)anthracene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzo(a)pyrene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzo(b)fluoranthene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzo(g,h,i)perylene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Benzo(k)fluoranthene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
bis(2-Chloroethoxy)methane	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
bis(2-Chloroethyl)ether	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
bis(2-Ethylhexyl)phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Butyl benzyl phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Caprolactam	µg/L	**87**	< 9.9 U	< 9.7 U	< 9.9 U
Carbazole	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Chrysene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Dibenzo(a,h)anthracene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Dibenzofuran	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Diethyl phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Dimethyl phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Di-n-butyl phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Di-n-octyl phthalate	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Fluoranthene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Fluorene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Hexachloro-1,3-butadiene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Hexachlorobenzene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Hexachlorocyclopentadiene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Hexachloroethane	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Indeno(1,2,3-cd)pyrene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Isophorone	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Nitrobenzene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
N-Nitrosodi-n-propylamine	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
N-Nitrosodiphenylamine	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
p-Chloroaniline	µg/L	< 19 U	< 20 U	< 19 U	< 20 U
Pentachlorophenol	µg/L	< 48 U	< 50 U	< 49 U	< 49 U
Phenanthrene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Phenol	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U
Pyrene	µg/L	< 9.6 U	< 9.9 U	< 9.7 U	< 9.9 U

Table 6-3
Beryllium SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

	Matrix:	Groundwater	Pore Water	Surface Water	
	Location ID:	BS-1	PW-02B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/22/2019	3/27/2019	3/27/2019	3/27/2019
Analyte	Units				
TOC					
Total Organic Carbon	µg/L	**4000**	**1700**	--	--
VOCs					
1,1,1,2-Tetrachloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	µg/L	< 1.0 U	**19**	< 1.0 U	< 1.0 U
1,1-Dichloropropene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	µg/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2,3-Trichloropropane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	µg/L	< 5.0 U	< 5.0 U	< 9.7 U	< 9.9 U
1,2,4-Trimethylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromo-3-chloropropane	µg/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromoethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichlorobenzene	µg/L	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
1,2-Dichloroethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethene, Total	µg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
1,2-Dichloropropane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichlorobenzene	µg/L	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
1,3-Dichloropropane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	µg/L	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
2,2-Dichloropropane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone (MEK)	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
2-Chloroethyl vinyl ether	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
2-Chlorotoluene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-Pentanone	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
Acetone	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
Benzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromobenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromochloromethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	µg/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	µg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Tetrachloride	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CFC-11	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CFC-12	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	µg/L	< 5.0 U	**2.8 J**	< 5.0 U	< 5.0 U
Chloroform	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cymene (p-Isopropyltoluene)	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Table 6-3
Beryllium SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

	Matrix:	Groundwater	Pore Water	Surface Water	
	Location ID:	BS-1	PW-02B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/22/2019	3/27/2019	3/27/2019	3/27/2019
Analyte	**Units**				
Dichloromethane	µg/L	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachloro-1,3-butadiene	µg/L	< 5.0 U	< 5.0 U	< 9.7 U	< 9.9 U
Isopropylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methyl N-Butyl Ketone (2-Hexanone)	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
Methyl-tert-butylether	µg/L	< 10 U	< 10 U	< 10 U	< 10 U
n-Butylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene (Monomer)	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Total Xylenes	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	µg/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl acetate	µg/L	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl chloride	µg/L	< 1.0 U	**1.5**	< 1.0 U	< 1.0 U
Water Quality Parameters					
Dissolved Oxygen	mg/L	0	8.81	--	8.81
Oxidation Reduction Potential	mV	60	--	--	--
Specific Conductivity	µS/cm	0.305	0.191	--	0.191
Temperature	°C	8.49	5.32	--	5.32
pH	S.U.	6.64	0.72	--	6.72

Notes:
1. Values exceeding laboratory reporting limits are bolded.
2. Water quality parameters are measured in the field during each purge event.

°C - degrees Celsius
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
S.U. - standard units
SVOC - semi-volatile organic compound
TOC - total organic carbon
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-4
C-Area SWMU Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

Matrix:			Groundwater															
Location ID:			MW-01	DUP-02 (MW-02)	MW-02	MW-5	MW-10	MW-11	MW-12	MW-13	MW-19	MW-20	MW-22	DUP-03 (MW-23)	MW-23	MW-25	MW-28	MW-29
Sample Date:			3/20/2019	3/20/2019	3/20/2019	3/22/2019	3/20/2019	3/22/2019	3/20/2019	3/20/2019	3/22/2019	3/20/2019	3/20/2019	3/22/2019	3/22/2019	3/22/2019	3/22/2019	3/22/2019
Analyte	CAO	Units																
Anions																		
Perchlorate	4	µg/L	**240**	**960**	**1000**	**15**	**46**	--	**350**	**250**	**650**	**480**	**24**	**7.7**	**7.9**	**56**	**160**	**4100**
VOCs																		
1,1,1-Trichloroethane	200	µg/L	**34**	**47**	**43**	< 1.0 U	**0.45 J**	--	< 1.0 U	< 10 U	**2.8**	**120**	**78**	**7.3**	**7.9**	< 1.0 U	**14**	**12**
1,1,2-Trichloroethane	5	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	µg/L	**12**	**1.1**	< 1.0 UH	**0.60 J**	**5.9**	--	< 1.0 U	**8.4 J**	**10**	**29**	**9.9**	**1.3**	**1.4**	< 1.0 U	**2.3**	**7.8**
1,2-Dichloroethane	5	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.64 J**	< 1.0 U
Benzene	5	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	5	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	100	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	**740**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	80	µg/L	**0.55 J**	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	**0.55 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichloromethane	5	µg/L	< 5.0 U	< 5.0 U	< 1.0 UH	< 5.0 U	< 5.0 U	--	< 5.0 U	< 50 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	**29**	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	**0.80 J**	**13**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	5	µg/L	**0.66 J**	< 1.0 U	< 1.0 UH	**14**	**7.8**	--	< 1.0 U	**350**	**1.7**	**5.8**	**21**	< 1.0 U	< 1.0 U	< 1.0 U	**20**	**17**
Vinyl chloride	2	µg/L	< 1.0 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U	--	< 1.0 U	< 10 U	< 1.0 U	**3.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.1**	< 1.0 U
Water Quality Parameters																		
Dissolved Oxygen	--	mg/L	2.55	--	0.27	3.61	6.59	2.64	0	--	0	6.99	0	--	5.19	0	0	0
Oxidation Reduction Potential	--	mV	248	--	234	229	263	309	91	--	173	91	204	--	274	180	-6	179
Specific Conductivity	--	µS/cm	0.118	--	0.07	0.242	0.114	0.141	0.283	--	0.143	0.25	0.217	--	0.064	0.328	0.416	0.219
Temperature	--	°C	9.25	--	10.04	8.42	13.94	10.19	10.84	--	10.65	9.82	9.51	--	8.49	9.61	9.62	10.73
pH	--	S.U.	5.42	--	5.48	6.26	5.24	5.37	7.44	--	5.81	6.25	6.02	--	5.46	6.73	6.6	6.16
Monitored Natural Attenuation Parameters																		
Sulfate	--	µg/L	--	**8200**	**8200**	--	--	--	**19000**	--	--	--	**23000**	--	--	**22000**	**26000**	--
Dissolved Iron	--	µg/L	--	< 50 U	**18 J**	--	--	--	**17 J**	--	--	--	**57**	--	--	< 50 U	**14000**	--
Total Organic Carbon	--	µg/L	--	**1100**	**1100**	--	--	--	**1500**	--	--	--	**680 J**	--	--	**3100**	**9200**	--
MDE CHS Permit Parameters																		
Total Nitrogen	--	µg/L	--	--	--	--	--	**1600**	--	--	--	--	--	--	--	--	--	--
Total Kjeldahl Nitrogen	--	µg/L	--	--	--	--	--	--	--	--	--	**2700**	**130 J**	--	--	--	--	--
Nitrate-Nitrogen	--	µg/L	--	--	--	--	--	--	--	--	--	**500**	**870**	--	--	--	--	--

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the
2. Water quality parameters are measured in the field during each purge event.
3. Duplicate samples are presented with parent well ID in parentheses.

°C - degrees Celsius
CAO - corrective action objective
CHS - Controlled Hazardous Substance
MDE - Maryand Department of the Environment
SIM - selective ion monitoring
SVOC - semi-volatile organic compound
J - Indicates an estimated result
mg/L - milligram per liter
mV - millivolt
S.U. - standard units
U - Indicates the analyte was analyzed but not detected above the detection limit
VOC - volatile organic compound
µg/L - microgram per liter
µS/cm - microsiemens per centimeter
-- - not analyzed or measured

Table 6-5
Upstream Surface Water Sample Results
Alliant Techsystems Operations LLC
Elkton, Maryland

ARCADIS Design & Consultancy for natural and built assets

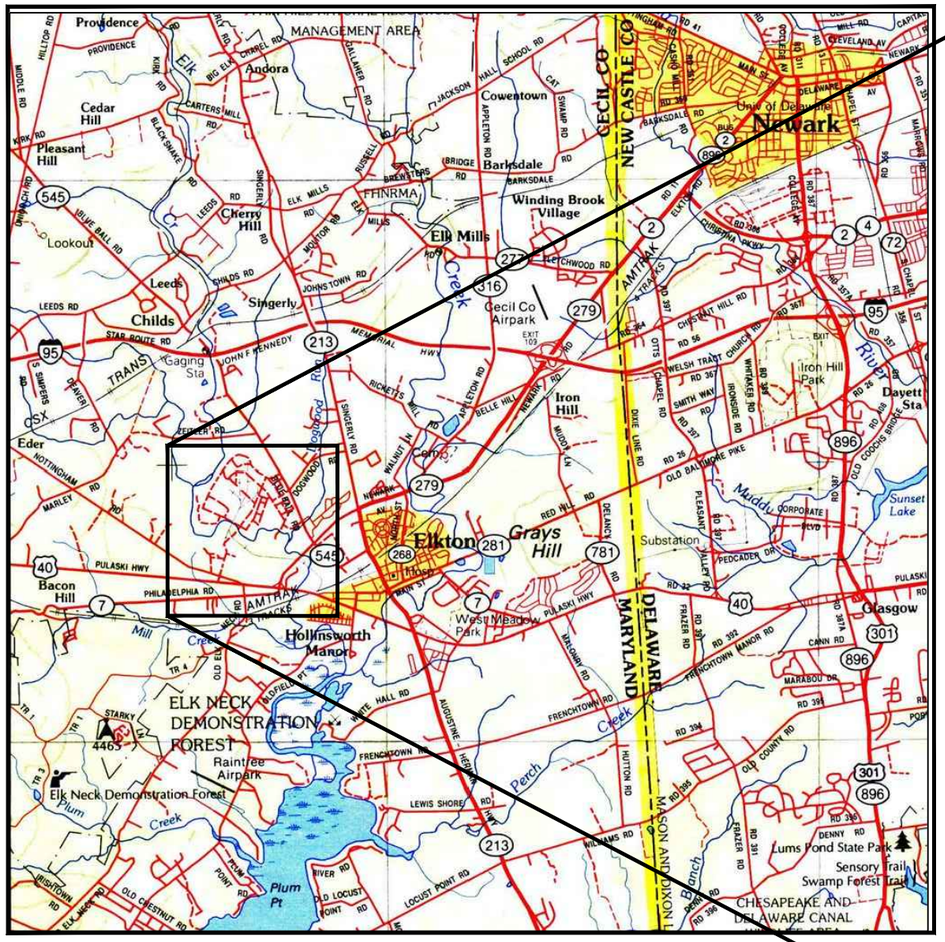
	Matrix:	Surface Water
	Location ID:	SW1C
	Sample Date:	3/27/2019
Analyte	**Units**	
Anions		
Perchlorate	ug/L	**0.53 J**
SVOCs SIM		
1,4-Dioxane	ug/L	--
Naphthalene	ug/L	--
VOCs		
1,1,1-Trichloroethane	ug/L	< 1.0 U
1,1-Dichloroethane	ug/L	< 1.0 U
1,1-Dichloroethene	ug/L	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	< 1.0 U
Benzene	ug/L	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 1.0 U
Trichloroethene	ug/L	< 1.0 U
Vinyl chloride	ug/L	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Values exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
-- - not analyzed or measured
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit

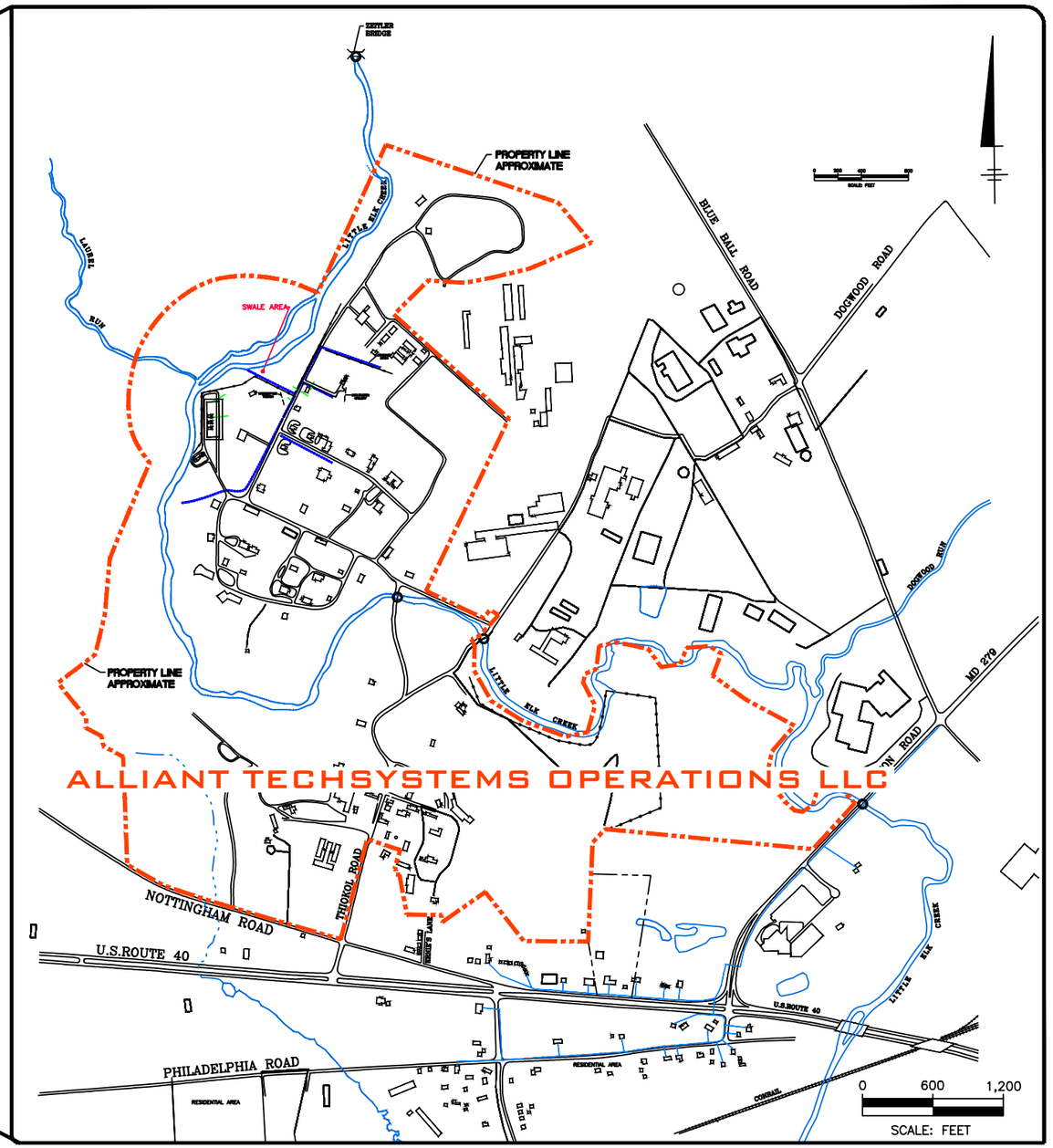
FIGURES



MAP SOURCE: MARYLAND DELAWARE ATLAS, DeLORME, FREEPORT MAIN, 1993

0 .75 1.5

SCALE: MILES



ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

SITE LOCATION

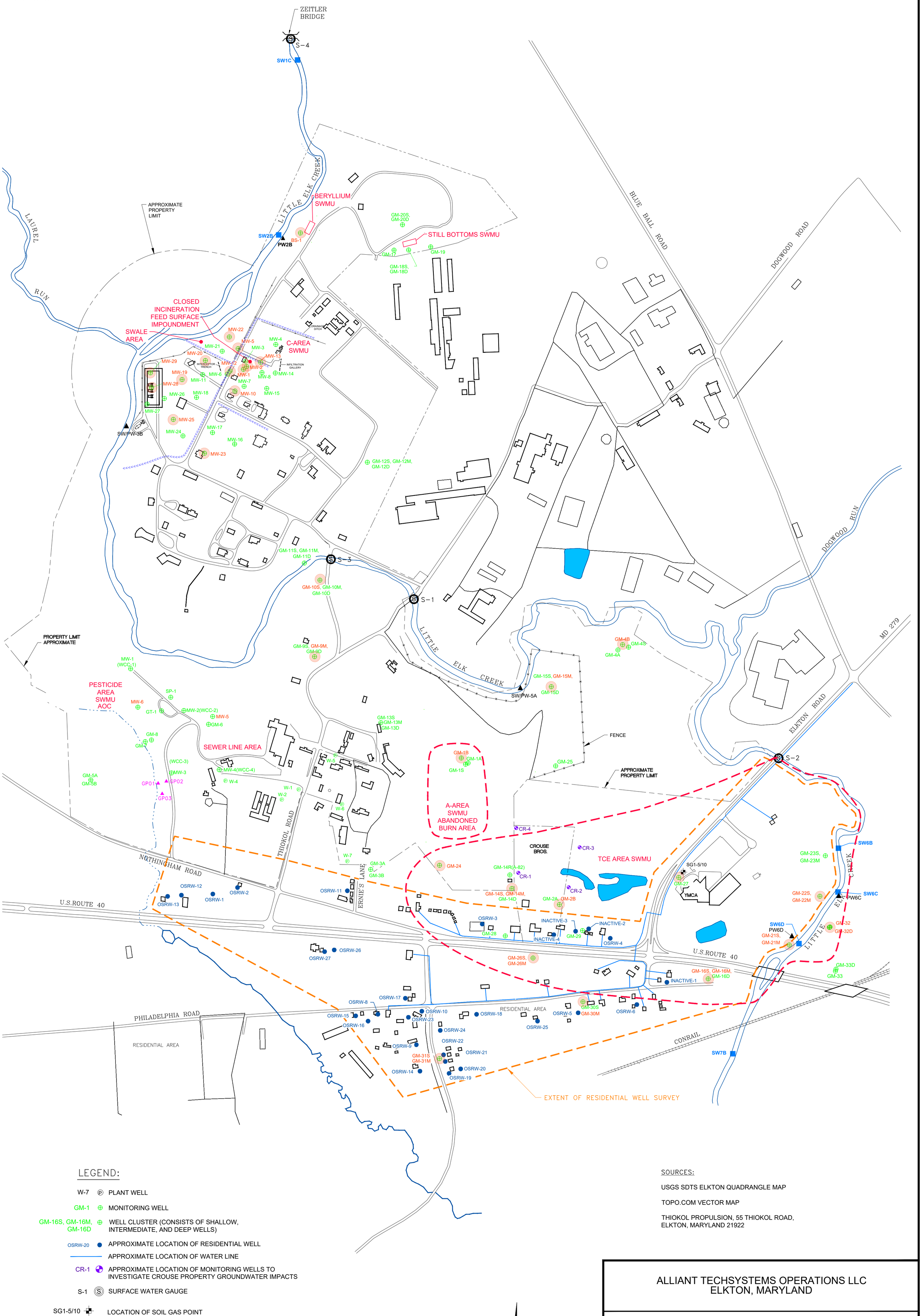
ARCADIS Design & Consultancy for natural and built assets

FIGURE
1-1

CITY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(On)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\CMS-SIT-LO.dwg LAYOUT: MODEL SAVED: 8/14/2018 5:05 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 8/28/2019 10:53 AM BY:
BERNDGEN, WENDY
XREFS: IMAGES: PROJECTNAME: ---
site1.JPG

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\MD001106 MW01.dwg LAYOUT: 2-1 SAVED: 8/7/2019 4:18 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTQUICK.CTB PLOTTED: 8/29/2019 8:54 PM BY: BERNDGEN, WENDY

XREFS: IMAGES: PROJECTNAME: ----
MD001106X00



LEGEND:

- W-7 (P) PLANT WELL
- GM-1 MONITORING WELL
- GM-16S, GM-16M, GM-16D WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
- OSRW-20 APPROXIMATE LOCATION OF RESIDENTIAL WELL
- APPROXIMATE LOCATION OF WATER LINE
- CR-1 APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- S-1 SURFACE WATER GAUGE
- SG1-5/10 LOCATION OF SOIL GAS POINT
- SW7A SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S GROUNDWATER PERFORMANCE MONITORING LOCATION
- APPROXIMATE SWMU OUTLINE

NOTES:
AOC=AREA OF CONCERN
SWMU=SOLID WASTE MANAGEMENT UNIT
TCE=TRICHLOROETHENE

0 200 400 800
SCALE: FEET

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

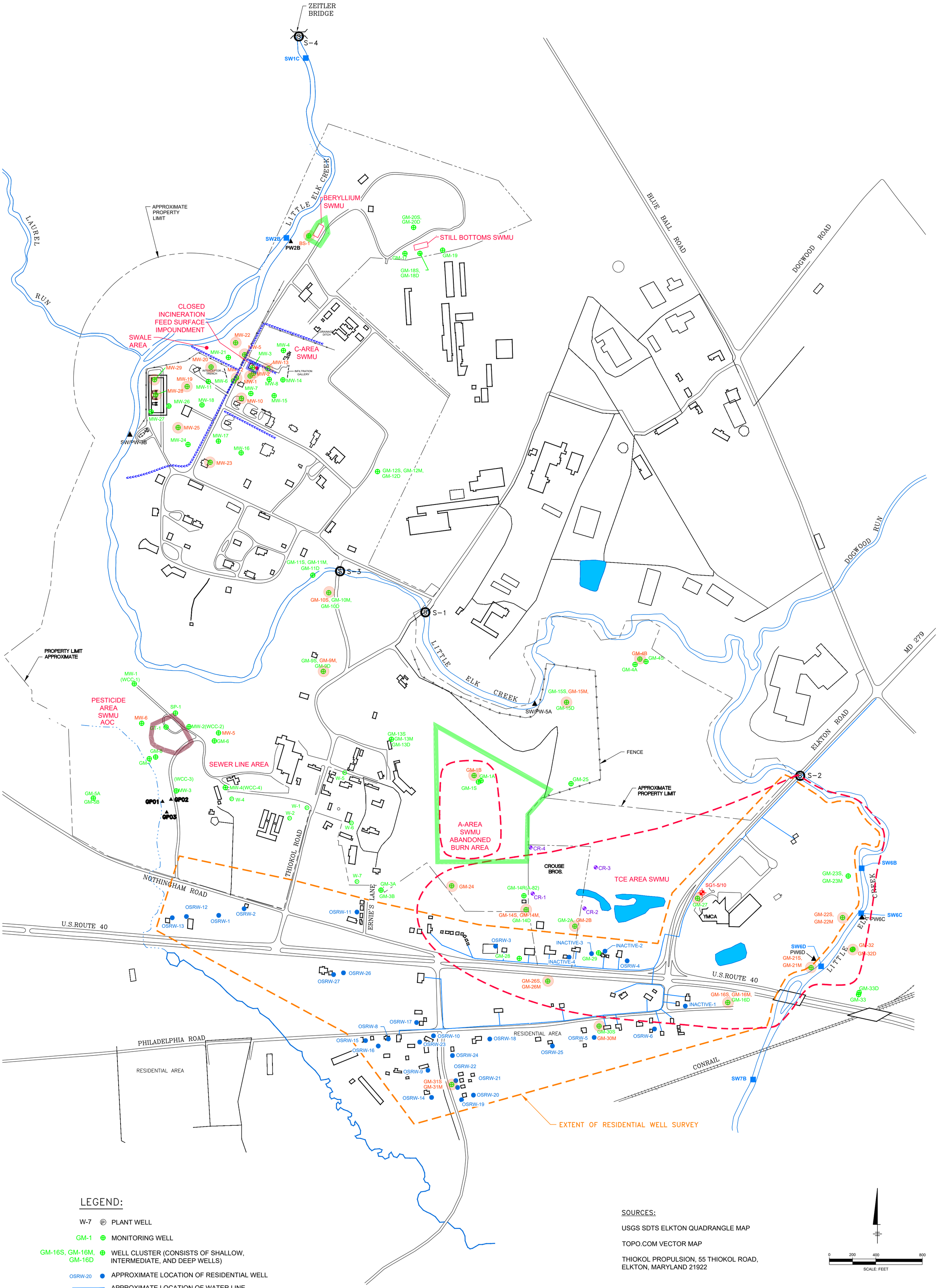
ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

SITE PLAN AND PERFORMANCE MONITORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2-1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\MD001106 MW01.dwg LAYOUT: 3-1 SR AREA SAVED: 8/7/2019 4:18 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/29/2019 8:54 PM BY: BERNDGEN, WENDY
XREFS: IMAGES: PROJECTNAME: ----
MD001106X00



LEGEND:

- W-7 — PLANT WELL
- GM-1 — MONITORING WELL
- GM-16S, GM-16M, GM-16D — WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
- OSRW-20 — APPROXIMATE LOCATION OF RESIDENTIAL WELL
- APPROXIMATE LOCATION OF WATER LINE
- CR-1 — APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- S-1 — SURFACE WATER GAUGE
- SG1-5/10 — LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- APPROXIMATE SWMU OUTLINE

- SOIL EXCAVATION RESTRICTION AREA
- SURVEYED (2018) SOIL EXCAVATION RESTRICTION AREA
- SURVEYED (2019) SOIL RESTRICTION AREA

NOTES:
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SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

SOIL EXCAVATION RESTRICTION AREA

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3-1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\6-1 POTOMAC WELLS Shall MAR 2019.dwg LAYOUT: 6-1 SAVED: 6/10/2019 12:34 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/29/2019 9:03 PM BY: BERNDGEN, WENDY
XREFS: IMAGES: PROJECTNAME: ----
MD001106X00

ZEITLER BRIDGE
S-4
SW1C
40
LITTLE ELK CREEK
BERYLLIUM SWMU
APPROXIMATE PROPERTY LIMIT
35
SW2B
BS-1
38.79
GM-20S, GM-20D
STILL BOTTOMS SWMU
GM-17
GM-19
GM-18S, GM-18D
BLUE BALL ROAD
DOGWOOD ROAD
LAUREL RUN
CLOSED INCINERATION FEED SURFACE IMPOUNDMENT
SWALE AREA
37.41
34.97
MW-22
35.49
MW-5
MW-4
MW-3
C-AREA SWMU
MW-21
MW-20
34.94
MW-29
33.71
MW-19
MW-13
38.01
MW-2
37.54
34.04
MW-28
33.99
MW-26
MW-11
35.33
MW-18
MW-6
MW-1
MW-7
MW-8
MW-14
MW-10
36.54
MW-15
MW-27
MW-25
34.46
MW-17
MW-24
MW-16
SW/PW-3B
30
MW-23
34.39
GM-12S, GM-12M, GM-1
35
40
30
25
20
GM-11S, GM-11M, GM-11D
S-3
20.96
GM-10S, GM-10M, GM-10D
S-1
LITTLE ELK CREEK
GM-9S, GM-9M, GM-9D
PROPERTY LIMIT APPROXIMATE
MW-1 (WCC-1)
PESTICIDE AREA SWMU AOC
29.41
MW-6
SP-1
GT-1
MW-2(WCC-2)
MW-5
25.53
GM-6
GM-8
GM-7
(WCC-3)
MW-3
MW-4(WCC-4)
GM-5A
GM-5B
GP01
GP02
GP03
W-4
W-1
W-2
W-6
GM-13S
GM-13M
GM-13D
W-5
ABANDONED PROPELLENT OPEN BURN FIELD AREA (A-AREA SWMU)
A-AREA SWMU ABANDONED BURN AREA
GM-1B
GM-1A
GM-1S
GM-25
FENCE
APPROXIMATE PROPERTY LIMIT
15
S-2
10
6
THIOKOL ROAD
NOTHINGHAM ROAD
W-7
GM-3A
GM-3B
ERNIE'S LANE
CR-4
CROUSE BROS.
CR-3
TCE AREA SWMU
GM-24
GM-14R(A-82)
CR-1
15.31
GM-14S, GM-14M, GM-14D
CR-2
GM-2A, GM-2B
SG1-5/10
GM-27
16.549
YMCA
GM-23S, GM-23M
SW6B
SW6C
PW6C
6.45
GM-22S, GM-22M
6.71
GM-32
GM-32D
SW6D
5.93
GM-21S, GM-21M
OSRW-12
OSRW-13
OSRW-1
OSRW-2
OSRW-11
U.S.ROUTE 40
OSRW-3
GM-28
INACTIVE-3
INACTIVE-4
GM-29
INACTIVE-2
OSRW-4
38.15
GM-26S, GM-26M
11.75
GM-16S, GM-16M, GM-16D
INACTIVE-1
GM-33D
GM-33
OSRW-27
OSRW-26
OSRW-8
OSRW-17
OSRW-15
OSRW-16
OSRW-10
OSRW-23
OSRW-18
RESIDENTIAL AREA
OSRW-5
GM-30S
GM-30M
33.61
OSRW-6
PHILADELPHIA ROAD
OSRW-24
OSRW-22
OSRW-9
32.12
GM-31S
GM-31M
OSRW-21
OSRW-14
OSRW-20
OSRW-19
OSRW-25
CONRAIL
SW7B
EXTENT OF RESIDENTIAL WELL SURVEY
GM-15S, GM-15M,
GM-15D
SW/PW-5A
GM-4B
GM-4S
GM-4A
MD 279
ELKTON ROAD
DOGWOOD RUN
LITTLE ELK CREEK
DRAINAGE DITCH
INTERCEPTOR TRENCH
INFILTRATION GALLERY

LEGEND:

- MONITORING WELL
- APPROXIMATE LOCATION OF OFF-SITE RESIDENTIAL WELL
- APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- LOCATION OF SOIL GAS POINT
- 15 — INFERRED WATER LEVEL CONTOUR (FT NAVD88)
- 5.49 — WATER LEVEL (FT NAVD88)
- 35.96* — WATER LEVEL REPRESENTS PERCHED ZONE NOT USED IN CONTOURING
- NAVD88 NORTH AMERICAN VERTICAL DATUM 88
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE SWMU OUTLINE

NOTES:
SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

0 200 400 800
SCALE: FEET

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

SITE-WIDE GROUNDWATER ELEVATIONS SHALLOW ZONE MARCH 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6-1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\6-2 POTOMAC WELLS Inter MAR 2019.dwg LAYOUT: 6-2 SAVED: 8/29/2019 9:06 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/30/2019 9:40 AM BY: BERNDGEN, WENDY

XREFS: IMAGES: PROJECTNAME: ----
MD001106X00

ZEITLER BRIDGE
S-4
SW1C
LITTLE ELK CREEK
BERYLLIUM SWMU
APPROXIMATE PROPERTY LIMIT
LAUREL RUN
SW2B
BS-1
PW2B
GM-20S, GM-20D
STILL BOTTOMS SWMU
GM-17
GM-19
GM-18S, GM-18D
BLUE BALL ROAD
DOGWOOD ROAD
CLOSED INCINERATION FEED SURFACE IMPOUNDMENT
SWALE AREA
DRAINAGE DITCH
C-AREA SWMU
INTERCEPTOR TRENCH
INFILTRATION GALLERY
FENCE
SW/PW-3B
GM-12S, GM-12M, GM-12D
GM-11S, GM-11M, GM-11D
S-3
GM-10S, GM-10M, GM-10D
S-1
DOGWOOD RUN
PROPERTY LIMIT APPROXIMATE
21.45
GM-9S, GM-9M, GM-9D
LITTLE ELK CREEK
15.54
GM-4B
GM-4S
GM-4A
18.62
GM-15S, GM-15M,
GM-15D
SW/PW-5A
MD 279
ELKTON ROAD
PESTICIDE AREA SWMU AOC
MW-1 (WCC-1)
SP-1
MW-6
GT-1
MW-2(WCC-2)
MW-5
GM-6
GM-8
GM-7
(WCC-3)
MW-3
MW-4(WCC-4)
GM-5A
GM-5B
GP01
GP02
GP03
W-4
W-1
W-2
W-6
W-5
GM-13S
GM-13M
GM-13D
FENCE
19.05
GM-1B
GM-1A
GM-1S
GM-25
APPROXIMATE PROPERTY LIMIT
ABANDONED PROPELLENT OPEN BURN FIELD AREA (A-AREA SWMU)
A-AREA SWMU ABANDONED BURN AREA
THIOKOL ROAD
NOTHINGHAM ROAD
W-7
GM-3A
GM-3B
ERNIE'S LANE
GM-24
17.62
GM-14R(A-82)
CR-1
CR-4
CR-3
CROUSE BROS.
TCE AREA SWMU
SG1-5/10
GM-27
YMCA
GM-23S, GM-23M
SW6B
ELK CREEK
SW6C
PW6C
GM-22S, GM-22M
6.45
6.44
GM-32
GM-32D
SW6D
PW6D
GM-21S, GM-21M
7.88
LITTLE ELK CREEK
GM-14S, GM-14M, GM-14D
16.94
GM-2A, GM-2B
-8.40
CR-2
OSRW-12
OSRW-13
OSRW-1
OSRW-2
OSRW-11
OSRW-3
GM-28
INACTIVE-3
INACTIVE-4
GM-29
INACTIVE-2
OSRW-4
U.S.ROUTE 40
OSRW-26
OSRW-27
GM-26S, GM-26M
12.60
12.33
GM-16S, GM-16M, GM-16D
INACTIVE-1
GM-33D
GM-33
OSRW-8
OSRW-17
OSRW-15
OSRW-16
OSRW-10
OSRW-23
OSRW-18
OSRW-24
OSRW-22
OSRW-21
OSRW-9
GM-31S
GM-31M
13.80
OSRW-14
OSRW-20
OSRW-19
RESIDENTIAL AREA
OSRW-5
GM-30S
GM-30M
OSRW-6
OSRW-25
PHILADELPHIA ROAD
RESIDENTIAL AREA
CONRAIL
SW7B
EXTENT OF RESIDENTIAL WELL SURVEY
S-2
APPROXIMATE PROPERTY LIMIT
20
15
10

LEGEND:

- MONITORING WELL
- APPROXIMATE LOCATION OF OFF-SITE RESIDENTIAL WELL
- APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
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- 16.94 — WATER LEVEL (FT NAVD88)
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- NAVD88 — NORTH AMERICAN VERTICAL DATUM 88
- INFERRED GROUNDWATER FLOW DIRECTION
- APPROXIMATE SWMU OUTLINE

NOTES:
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0 200 400 800
SCALE: FEET

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

SITE-WIDE GROUNDWATER ELEVATIONS INTERMEDIATE ZONE MARCH 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6-2

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
MD001106X00

ZEITLER BRIDGE

S-4

SW1C

SW1C		
Sample Date	3/29/2018	3/27/2019
Perchlorate	**0.79 J**	**0.53 J**
1,4-Dioxane	NA	NA
Trichloroethene	<1.0 U	<1.0 U

SW2B		
Sample Date	3/26/2018	3/27/2019
Perchlorate	**0.61 J**	**0.80 J**
1,4-Dioxane	NA	NA
Trichloroethene	<1.0 U	<1.0 U

PW2B		
Sample Date	3/26/2018	3/27/2019
Perchlorate	**0.41 J**	**0.42 J**
1,4-Dioxane	NA	NA
Trichloroethene	< 1.0 U	<1.0 U

MW-22					
Sample Date	9/3/1992	10/2/2017	3/23/2018	3/20/2019	Trend
Perchlorate	NA	**140**	**120**	**24**	NS
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	< 500 U	**97**	**60**	**21**	-

BS-1	
Sample Date	3/22/2019
Perchlorate	< 1.0 U
1,4-Dioxane	NA
Trichloroethene	< 1.0 U

MW-12					
Sample Date	3/5/1992	10/2/2017	3/19/2018	3/20/2019	Trend
Perchlorate	NA	**2200**	**550**	**350**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**600**	**44**	< 1.0 U	< 1.0 U	-

MW-5					
Sample Date	3/5/1992	10/2/2017	3/23/2018	3/22/2019	Trend
Perchlorate	NA	**160**	**110**	**15**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**1200**	**110**	**71**	**14**	-

LITTLE ELK CREEK

BERYLLIUM SWMU

STILL BOTTOMS SWMU

C-AREA SWMU

CLOSED [illegible] ATION [illegible] FACE [illegible] MENT

MW-20					
Sample Date	9/3/1992	10/2/2017	3/19/2018	3/20/2019	Trend
Perchlorate	NA	**270**	**250**	**480**	NS
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	< 500 U	**7**	**1.6**	**5.8**	-

MW-2					
Sample Date	3/5/1992	10/2/2017	3/23/2018	3/20/2019	Trend
Perchlorate	NA	**68**	**86**	**1000**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**800**	**27**	**18 J**	<1.0 UH	-

MW-19					
Sample Date	9/3/1992	10/2/2017	3/23/2018	3/22/2019	Trend
Perchlorate	NA	**880**	**95**	**650**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	< 500 U	**3**	**2.5**	**1.7**	-

MW-13					
Sample Date	3/5/1992	10/2/2017	3/23/2018	3/20/2019	Trend
Perchlorate	NA	**50**	**400**	**250**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**940**	**110**	**210**	**350**	-

MW-1					
Sample Date	3/5/1992	10/2/2017	3/19/2018	3/20/2019	Trend
Perchlorate	NA	**7500**	**180**	**240**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**600**	**64**	**0.78 J**	**0.66 J**	-

MW-10					
Sample Date	3/5/1992	10/2/2017	3/23/2018	3/20/2019	Trend
Perchlorate	NA	**82**	**200**	**46**	+
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**760**	<0.5 U	**5.6**	**7.8**	-

MW-29					
Sample Date	6/24/1992	10/2/2017	3/19/2018	3/22/2019	Trend
Perchlorate	NA	**2100**	**2700**	**4100**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**210**	**15**	**15**	**17**	-

MW-25					
Sample Date	9/3/1992	10/2/2017	3/23/2018	3/22/2019	Trend
Perchlorate	NA	**72**	**54**	**56**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**80**	<0.5 U	**0.49 J**	<1.0 U	-

MW-23					
Sample Date	9/3/1992	10/2/2017	3/16/2018	3/22/2019	Trend
Perchlorate	NA	**16**	**18**	**7.9**	-
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**100**	<0.5 U	**0.61 J**	**<1.0 U**	-

MW-28					
Sample Date	3/5/1992	10/2/2017	3/19/2018	3/22/2019	Trend
Perchlorate	NA	**1200**	**1700**	**160**	NS
1,4-Dioxane	NA	NA	NA	NA	NE
Trichloroethene	**170**	**50**	**49**	**20**	-

GM-10S					
Sample Date	9/2/1994	03/18/2004	3/19/2018	3/20/2019	Trend
Perchlorate	NA	**45.7**	**14**	**4.2**	NE
1,4-Dioxane	NA	**7.6**	**5.3 J**	**0.89**	NE
Trichloroethene	**6**	**8.7**	**7.8**	**3**	NS

SW6B			
Sample Date	11/30/2006	3/26/2018	3/27/2019
Perchlorate	NA	**2.1**	**1.6**	
1,4-Dioxane	NA	< 0.40 U	< 0.40 U
Trichloroethene	**6.9**	**4.4**	**3.8**

GM-22S					
Sample Date	03/23/2004	05/20/2014	3/22/2018	3/25/2019	Trend
Perchlorate	**183**	**97**	**67**	**61**	-
1,4-Dioxane	**150**	**33**	**13**	**13**	NS
Trichloroethene	**3200**	**1500**	**1000**	**1200**	NS

SW6D			
Sample Date	11/30/2006	3/26/2018	3/27/2019
Perchlorate	NA	**2.7**	**4.4**
1,4-Dioxane	NA	< 0.40 U	**1.6**
Trichloroethene	**9.3**	**6.2**	**24**

PW6D		
Sample Date	3/26/2018	03/27/2019
Perchlorate	**2.5**	**57**
1,4-Dioxane	< 0.50 U	**3.7**
Trichloroethene	**6.1**	**160**

SW6C			
Sample Date	11/30/2006	3/26/2018	3/27/2019
Perchlorate	NA	**2.2**	**1.5**
1,4-Dioxane	NA	< 0.40 U	< 0.40 U
Trichloroethene	**7.8**	**4.8**	**4.6**

GM-27					
Sample Date	04/01/2004	05/20/2014	3/22/2018	3/21/2019	Trend
Perchlorate	< 4.0 U	< 4.0 U	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	< 5.0 U	< 9.5 U	< 0.42 U	< 0.40 U	NE
Trichloroethene	< 10 U	< 0.50 U	< 1.0 U	< 1.0 U	NE

GM-21S					
Sample Date	11/05/2002	05/20/2014	3/22/2018	3/25/2019	Trend
Perchlorate	**510**	**890**	**690**	**64**	NS
1,4-Dioxane	NA	**48**	**19**	**20**	NS
Trichloroethene	**1100 D**	**1200**	**980**	**1100**	NS

GM-14S					
Sample Date	09/16/1994	05/13/2014	3/28/2018	3/19/2019	Trend
Perchlorate	NA	**1.5 J**	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	NA	**25**	**11**	**9.8**	-
Trichloroethene	**2100**	**19**	**7.1**	**8.4**	-

PW6C		
Sample Date	03/26/2018	03/27/2019
Perchlorate	**30**	**28**
1,4-Dioxane	**1.1**	**4.7**
Trichloroethene	**62**	**370**

GM-16S					
Sample Date	3/5/1992	3/24/2004	3/27/2018	3/26/2019	Trend
Perchlorate	NA	**11.3**	**89**	**280**	+
1,4-Dioxane	NA	<5.0 U	**2**	**15**	NE
Trichloroethene	**170**	**62**	**210**	**740**	+

SW7B			
Sample Date	11/30/2006	3/26/2018	3/27/2019
Perchlorate	NA	**2.7**	**2**
1,4-Dioxane	NA	< 0.40 U	< 0.40 U
Trichloroethene	**11**	**5.9**	**4.7**

GM-31S					
Sample Date	3/19/2004	05/11/2004	3/22/2018	3/26/2019	Trend
Perchlorate	**4.8**	< 4.0 U	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	< 5.0 U	NA	< 0.42 U	< 0.40 U	NE
Trichloroethene	**0.11 J**	NA	< 1.0 U	< 1.0 U	NE

GM-26S					
Sample Date	11/05/2002	05/21/2014	3/27/2018	3/26/2019	Trend
Perchlorate	**19.2**	**100**	**98**	**110**	NS
1,4-Dioxane	NA	< 11 U	**1.2**	**2.6**	NE
Trichloroethene	**18**	**120**	**110**	**180**	NS

RUN

DOGWOOD ROAD

DOGWOOD RUN

MD 279

ELKTON ROAD

S-3

S-1

S-2

LITTLE ELK CREEK

DIRT ROAD

PROPERTY LIMIT APPROXIMATE

PESTICIDE AREA SWMU AOC

SEWER LINE AREA

A-AREA SWMU ABANDONED BURN AREA

THIOKOL ROAD

NOTHINGHAM ROAD

U.S.ROUTE 40

PHILADELPHIA ROAD

RESIDENTIAL AREA

ERNIE'S LANE

CONRAIL

SW/PW-3B

SW/PW-5A

INTERCEPTOR TRENCH

INFILTRATION GALLERY

DRAINAGE DITCH

YMCA

INACTIVE-1

EXTENT OF RESIDENTIAL WELL SURVEY

LEGEND:

- W-7 — PLANT WELL
- GM-1 — MONITORING WELL
- GM-16S, GM-16M, GM-16D — WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
- OSRW-20 — APPROXIMATE LOCATION OF RESIDENTIAL WELL
- APPROXIMATE LOCATION OF WATER LINE
- CR-1 — APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- S-1 — SURFACE WATER GAUGE
- SG1-5/10 — LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- APPROXIMATE SWMU OUTLINE

NOTES:
AOC=AREA OF CONCERN
SWMU=SOLID WASTE MANAGEMENT UNIT
TCE=TRICHLOROETHENE
NA=NOT ANALYZED
J=ESTIMATED VALUE
U=ANALYTE NOT DETECTED ABOVE THE METHOD DETECTION LIMIT
MCL=MAXIMUM CONTAINMENT LEVELS
CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
VALUES IN BOLD ARE DETECTIONS
HIGHLIGHTED VALUES EXCEED THE SCREENING CRITERIA

MCL	
Perchlorate	**14**
1,4-Dioxane	**0.46**
Trichloroethene	**5**

\+ = Statistically significant increasing trend at p = 0.05
\- = Statistically significant decreasing trend at p = 0.05
NE = Not evaluated due to insufficient data
NS = Trend not statistically significant

0 200 400 800
SCALE: FEET

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

ANALYTICAL RESULTS SITE-WIDE POTOMAC WELLS SHALLOW

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FIGURE 6-3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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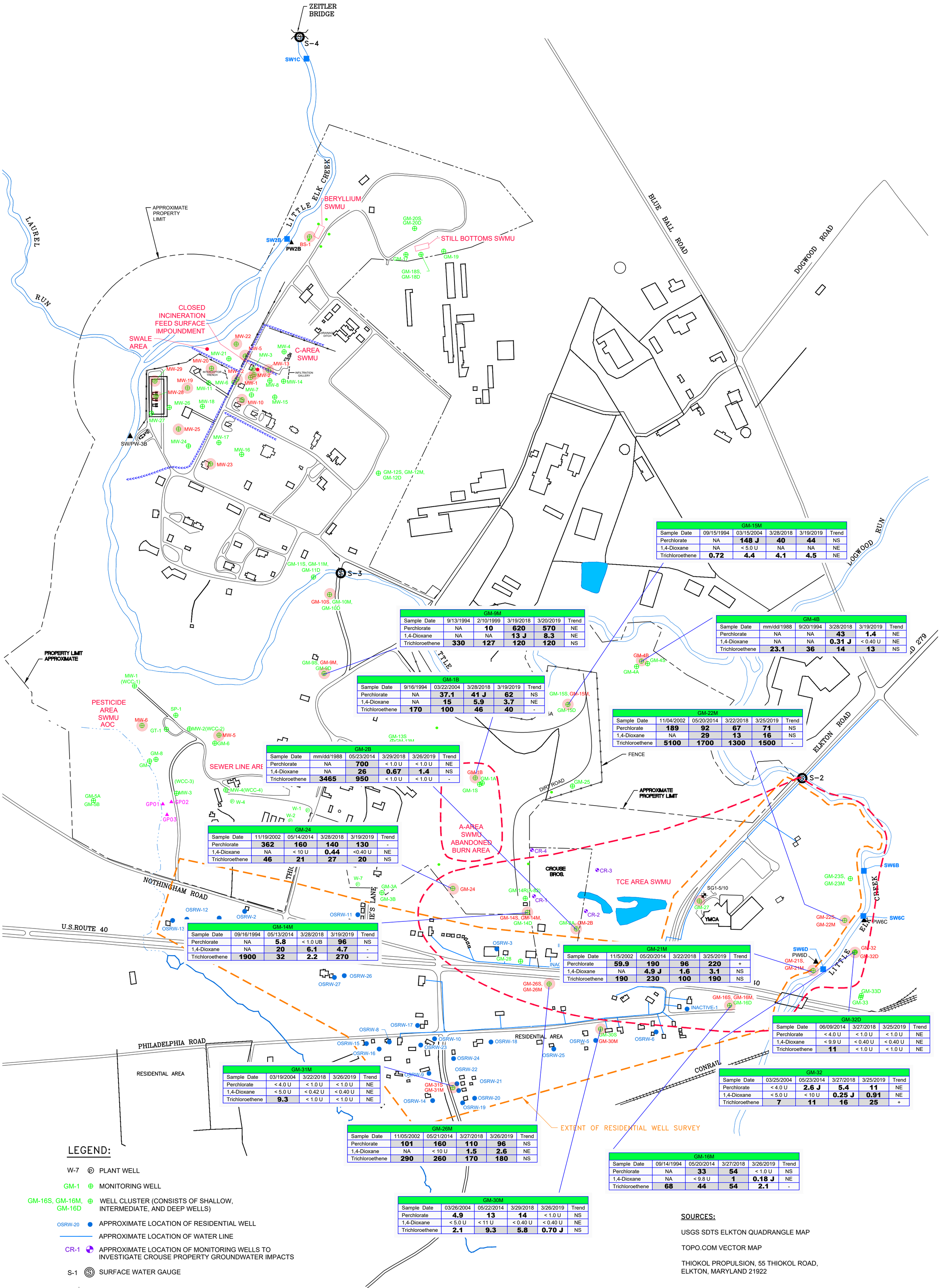

GM-15M					
Sample Date	09/15/1994	03/15/2004	3/28/2018	3/19/2019	Trend
Perchlorate	NA	**148 J**	**40**	**44**	NS
1,4-Dioxane	NA	< 5.0 U	NA	NA	NE
Trichloroethene	**0.72**	**4.4**	**4.1**	**4.5**	NE

GM-9M					
Sample Date	9/13/1994	2/10/1999	3/19/2018	3/20/2019	Trend
Perchlorate	NA	**10**	**620**	**570**	NE
1,4-Dioxane	NA	NA	**13 J**	**8.3**	NE
Trichloroethene	**330**	**127**	**120**	**120**	NS

GM-4B					
Sample Date	mm/dd/1988	9/20/1994	3/28/2018	3/19/2019	Trend
Perchlorate	NA	NA	**43**	**1.4**	NE
1,4-Dioxane	NA	NA	**0.31 J**	< 0.40 U	NE
Trichloroethene	**23.1**	**36**	**14**	**13**	NS

GM-1B					
Sample Date	9/16/1994	03/22/2004	3/28/2018	3/19/2019	Trend
Perchlorate	NA	**37.1**	**41 J**	**62**	NS
1,4-Dioxane	NA	**15**	**5.9**	**3.7**	NE
Trichloroethene	**170**	**100**	**46**	**40**	-

GM-22M					
Sample Date	11/04/2002	05/20/2014	3/22/2018	3/25/2019	Trend
Perchlorate	**189**	**92**	**67**	**71**	NS
1,4-Dioxane	NA	**29**	**13**	**16**	NS
Trichloroethene	**5100**	**1700**	**1300**	**1500**	-

GM-2B					
Sample Date	mm/dd/1988	05/23/2014	3/29/2018	3/26/2018	Trend
Perchlorate	NA	**700**	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	NA	**26**	**0.67**	**1.4**	NS
Trichloroethene	**3465**	**950**	< 1.0 U	< 1.0 U	-

GM-24					
Sample Date	11/19/2002	05/14/2014	3/28/2018	3/19/2019	Trend
Perchlorate	**362**	**160**	**140**	**130**	-
1,4-Dioxane	NA	< 10 U	**0.44**	<0.40 U	NE
Trichloroethene	**46**	**21**	**27**	**20**	NS

GM-14M					
Sample Date	09/16/1994	05/13/2014	3/28/2018	3/19/2019	Trend
Perchlorate	NA	**5.8**	< 1.0 UB	**96**	NS
1,4-Dioxane	NA	**20**	**6.1**	**4.7**	-
Trichloroethene	**1900**	**32**	**2.2**	**270**	-

GM-21M					
Sample Date	11/5/2002	05/20/2014	3/22/2018	3/25/2019	Trend
Perchlorate	**59.9**	**190**	**96**	**220**	+
1,4-Dioxane	NA	**4.9 J**	**1.6**	**3.1**	NS
Trichloroethene	**190**	**230**	**100**	**190**	NS

GM-32D				
Sample Date	06/09/2014	3/27/2018	3/25/2019	Trend
Perchlorate	< 4.0 U	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	< 9.9 U	< 0.40 U	< 0.40 U	NE
Trichloroethene	**11**	< 1.0 U	< 1.0 U	NE

GM-31M				
Sample Date	03/19/2004	3/22/2018	3/26/2019	Trend
Perchlorate	< 4.0 U	< 1.0 U	< 1.0 U	NE
1,4-Dioxane	< 5.0 U	< 0.42 U	< 0.40 U	NE
Trichloroethene	**9.3**	< 1.0 U	< 1.0 U	NE

GM-32					
Sample Date	03/25/2004	05/23/2014	3/27/2018	3/25/2019	Trend
Perchlorate	< 4.0 U	**2.6 J**	**5.4**	**11**	NE
1,4-Dioxane	< 5.0 U	< 10 U	**0.25 J**	**0.91**	NE
Trichloroethene	**7**	**11**	**16**	**25**	+

GM-26M					
Sample Date	11/05/2002	05/21/2014	3/27/2018	3/26/2019	Trend
Perchlorate	**101**	**160**	**110**	**96**	NS
1,4-Dioxane	NA	< 10 U	**1.5**	**2.6**	NE
Trichloroethene	**290**	**260**	**170**	**180**	NS

GM-16M					
Sample Date	09/14/1994	05/20/2014	3/27/2018	3/26/2019	Trend
Perchlorate	NA	**33**	**54**	< 1.0 U	NS
1,4-Dioxane	NA	< 9.8 U	**1**	**0.18 J**	NE
Trichloroethene	**68**	**44**	**54**	**2.1**	-

GM-30M					
Sample Date	03/26/2004	05/22/2014	3/29/2018	3/26/2019	Trend
Perchlorate	**4.9**	**13**	**14**	< 1.0 U	NS
1,4-Dioxane	< 5.0 U	< 11 U	< 0.40 U	< 0.40 U	NE
Trichloroethene	**2.1**	**9.3**	**5.8**	**0.70 J**	NS

LEGEND:

- W-7 — PLANT WELL
- GM-1 — MONITORING WELL
- GM-16S, GM-16M, GM-16D — WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
- OSRW-20 — APPROXIMATE LOCATION OF RESIDENTIAL WELL
- APPROXIMATE LOCATION OF WATER LINE
- CR-1 — APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- S-1 — SURFACE WATER GAUGE
- SG1-5/10 — LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- APPROXIMATE SWMU OUTLINE

NOTES:
AOC=AREA OF CONCERN
SWMU=SOLID WASTE MANAGEMENT UNIT
TCE=TRICHLOROETHENE
NA=NOT ANALYZED
J=ESTIMATED VALUE
U=ANALYTE NOT DETECTED ABOVE THE METHOD DETECTION LIMIT
MCL=MAXIMUM CONTAINMENT LEVELS
CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
VALUES IN BOLD ARE DETECTIONS
HIGHLIGHTED VALUES EXCEED THE SCREENING CRITERIA

MCL	
Perchlorate	**14**
1,4-Dioxane	**0.46**
Trichloroethene	**5**

\+ = Statistically significant increasing trend at p = 0.05
\- = Statistically significant decreasing trend at p = 0.05
NE = Not evaluated due to insufficient data
NS = Trend not statistically significant

0 200 400 800
SCALE: FEET

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

ANALYTICAL RESULTS SITE-WIDE POTOMAC WELLS INTERMEDIATE

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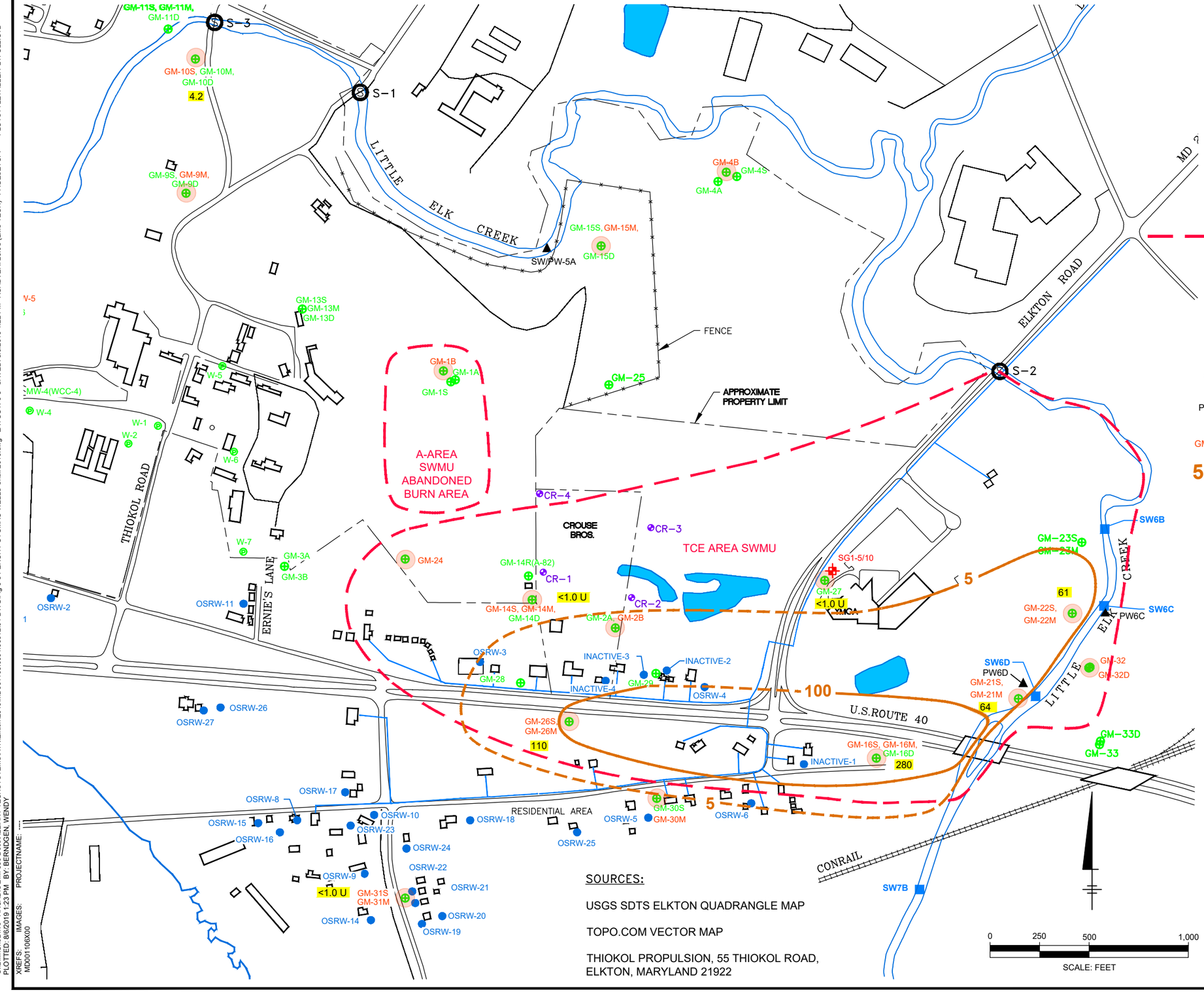
FIGURE
6-4



LEGEND:

- APPROXIMATE SWMU OUTLINE
- MONITORING WELL
- APPROXIMATE LOCATION OF OFF-SITE RESIDENTIAL WELL
- APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- 5 — PERCHLORATE ISOCONCENTRATION CONTOUR (µg/L) DASHED WHERE INFERRED
- 4.2 — PERCHLORATE CONCENTRATION µg/L (MARCH 2019)
- µg/L — MICROGRAMS PER LITER

NOTES:
FOR MONITORING WELLS WITH VERTICAL PROFILING, THE MAXIMUM DETECTION CONCENTRATION IS PRESENTED

SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

PERCHLORATE CONCENTRATIONS IN THE TCE SWMU AREA, SHALLOW ZONE POTOMAC GROUP - MARCH 2019

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FIGURE 6-5

C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.0001\2019-DWG\Fig 6-5 PERCH POTOMAC WELLS Shall 2019.dwg LAYOUT: 6-5 SAVED: 8/6/2019 1:22 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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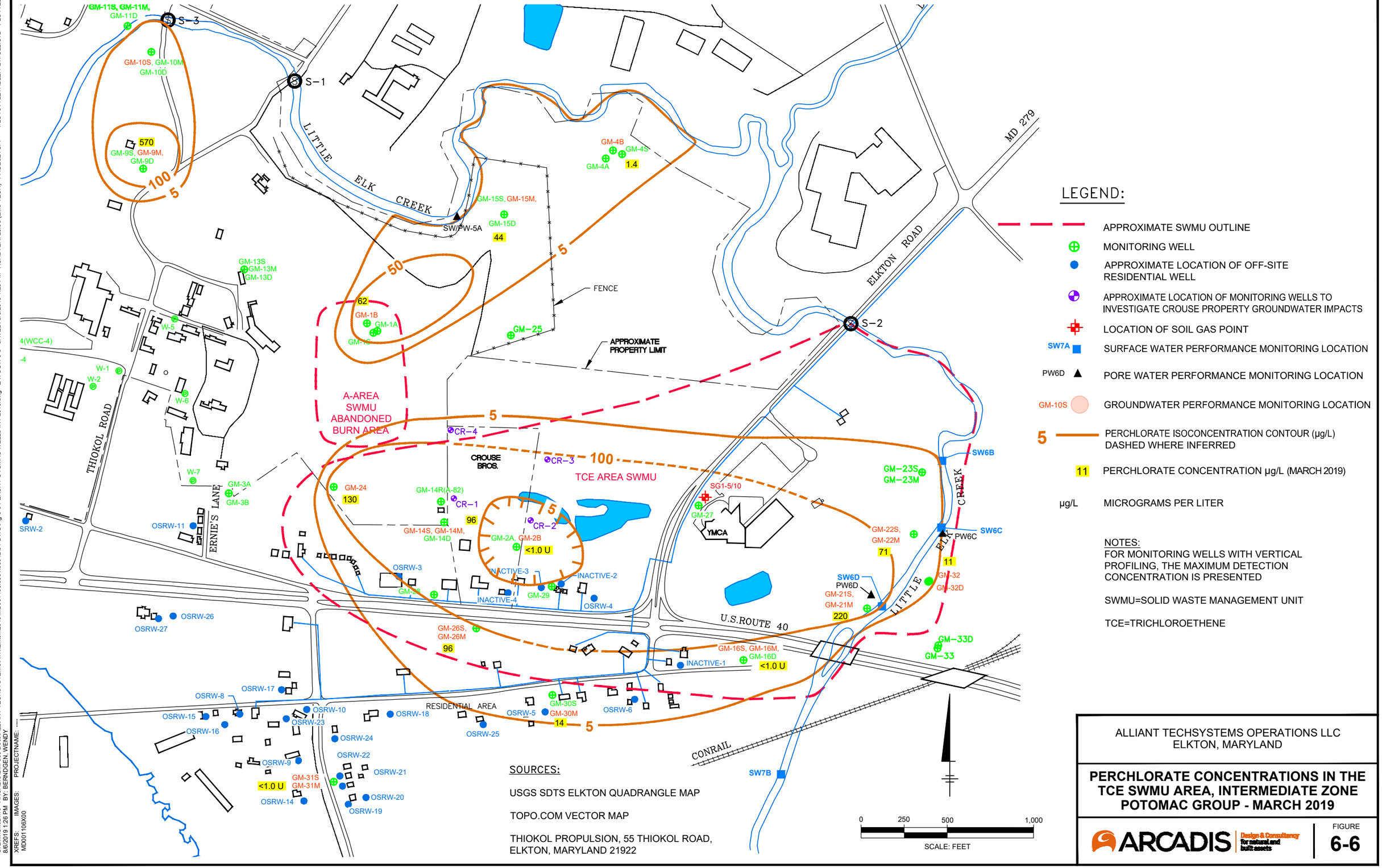

LEGEND:

- APPROXIMATE SWMU OUTLINE
- MONITORING WELL
- APPROXIMATE LOCATION OF OFF-SITE RESIDENTIAL WELL
- APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- 5 — PERCHLORATE ISOCONCENTRATION CONTOUR (µg/L) DASHED WHERE INFERRED
- 11 — PERCHLORATE CONCENTRATION µg/L (MARCH 2019)
- µg/L — MICROGRAMS PER LITER

NOTES:
FOR MONITORING WELLS WITH VERTICAL PROFILING, THE MAXIMUM DETECTION CONCENTRATION IS PRESENTED

SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

PERCHLORATE CONCENTRATIONS IN THE TCE SWMU AREA, INTERMEDIATE ZONE POTOMAC GROUP - MARCH 2019

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FIGURE 6-6

C:\BM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001\001201-DWG\Fig 6-6 PERCH POTOMAC WELLS INT 2019.dwg LAYOUT: 6-6 SAVED: 8/6/2019 1:25 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/6/2019 1:26 PM BY: BERNDGEN, WENDY
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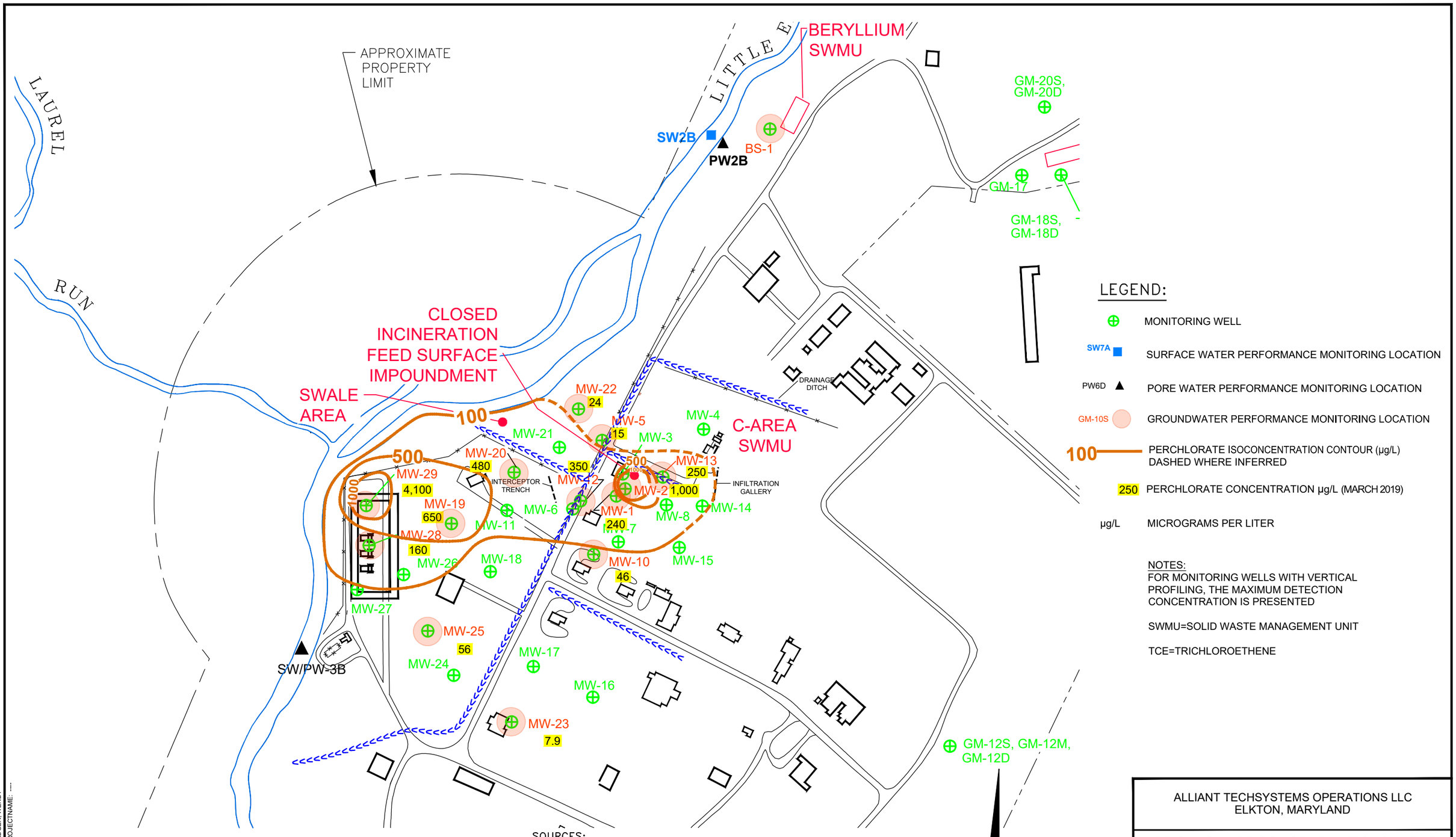

LEGEND:

- MONITORING WELL
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- 100 — PERCHLORATE ISOCONCENTRATION CONTOUR (µg/L) DASHED WHERE INFERRED
- 250 PERCHLORATE CONCENTRATION µg/L (MARCH 2019)
- µg/L MICROGRAMS PER LITER

NOTES:
FOR MONITORING WELLS WITH VERTICAL PROFILING, THE MAXIMUM DETECTION CONCENTRATION IS PRESENTED

SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

PERCHLORATE CONCENTRATIONS IN THE C-AREA AREA, SHALLOW ZONE POTOMAC GROUP - MARCH 2019

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FIGURE 6-7

C:\BM\OneDrive - ARCADIS\BM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.0001201-DWG\Fig 6-7 PERCH CAREA SHALL 2019.dwg LAYOUT: 6-7 SAVED: 8/6/2019 1:17 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/29/2019 9:26 PM BY: BERNDGEN, WENDY
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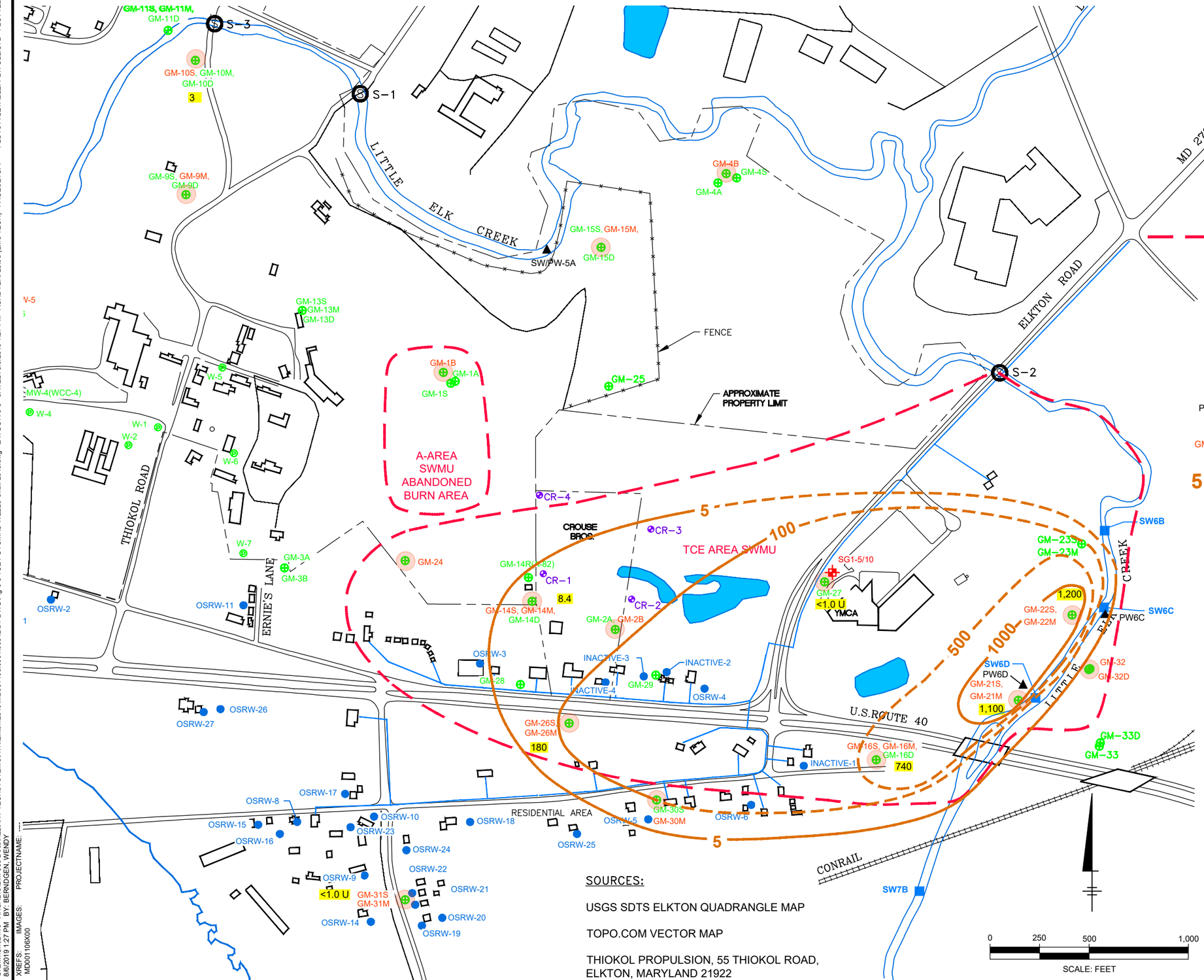

LEGEND:

- APPROXIMATE SWMU OUTLINE
- MONITORING WELL
- APPROXIMATE LOCATION OF OFF-SITE RESIDENTIAL WELL
- APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- 5 — TCE ISOCONCENTRATION CONTOUR (µg/L) DASHED WHERE INFERRED
- 8.4 — TCE CONCENTRATION µg/L (MARCH 2019)
- µg/L — MICROGRAMS PER LITER

NOTES:
FOR MONITORING WELLS WITH VERTICAL PROFILING, THE MAXIMUM DETECTION CONCENTRATION IS PRESENTED

SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

TCE CONCENTRATIONS IN THE TCE SWMU AREA, SHALLOW ZONE POTOMAC GROUP - MARCH 2019

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FIGURE 6-8

C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001\001201-DWG\Fig 6-8 TCE POTOMAC WELLS Shall 2019.dwg LAYOUT: 6-8 SAVED: 8/6/2019 1:27 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/6/2019 1:27 PM BY: BERNDGEN, WENDY
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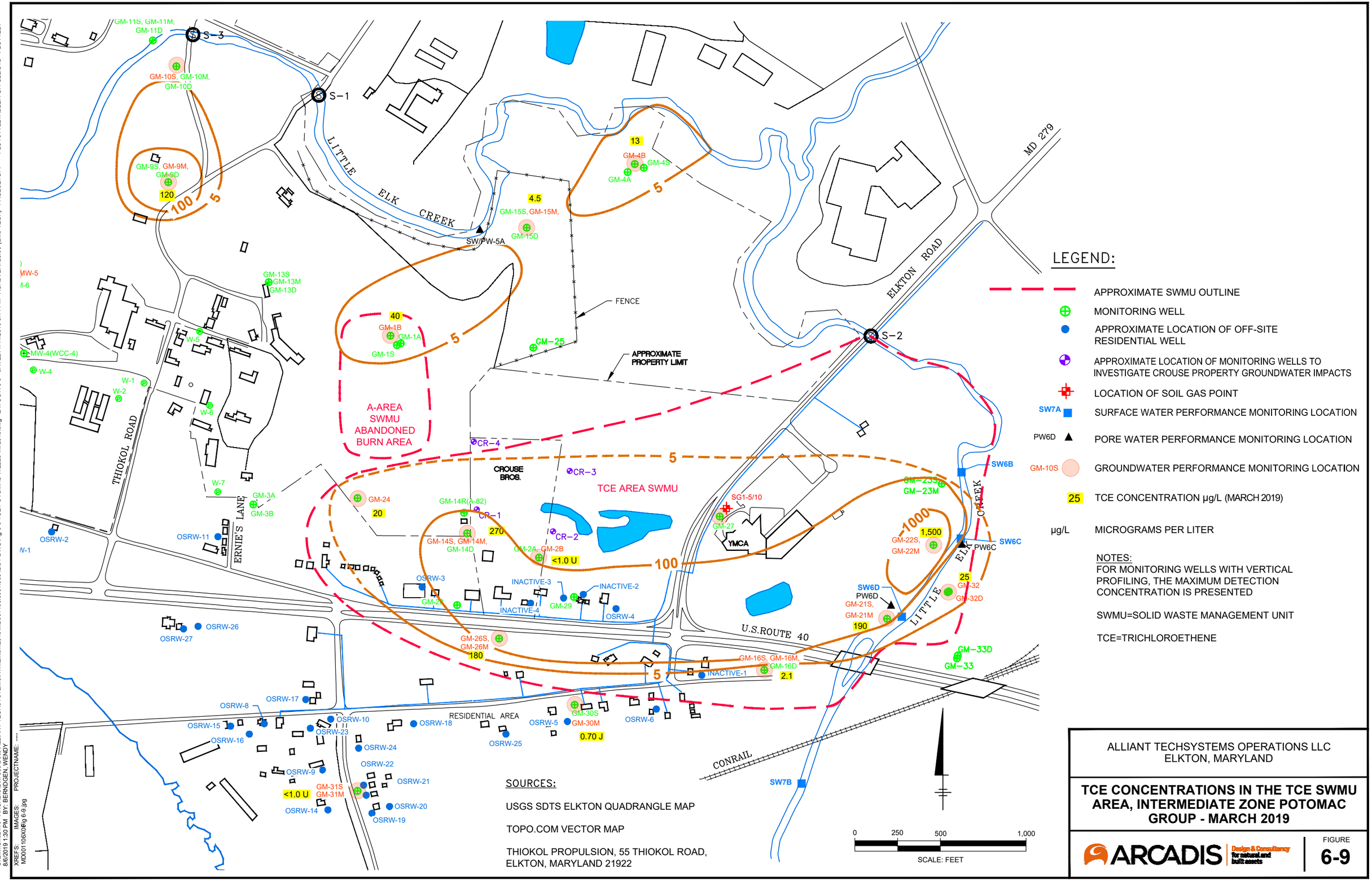

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

TCE CONCENTRATIONS IN THE TCE SWMU AREA, INTERMEDIATE ZONE POTOMAC GROUP - MARCH 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6-9

C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\Fig 6-9 TCE POTOMAC WELLS Int 2019.dwg LAYOUT: 6-9 SAVED: 7/11/2019 9:14 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/6/2019 1:30 PM BY: BERNDGEN, WENDY
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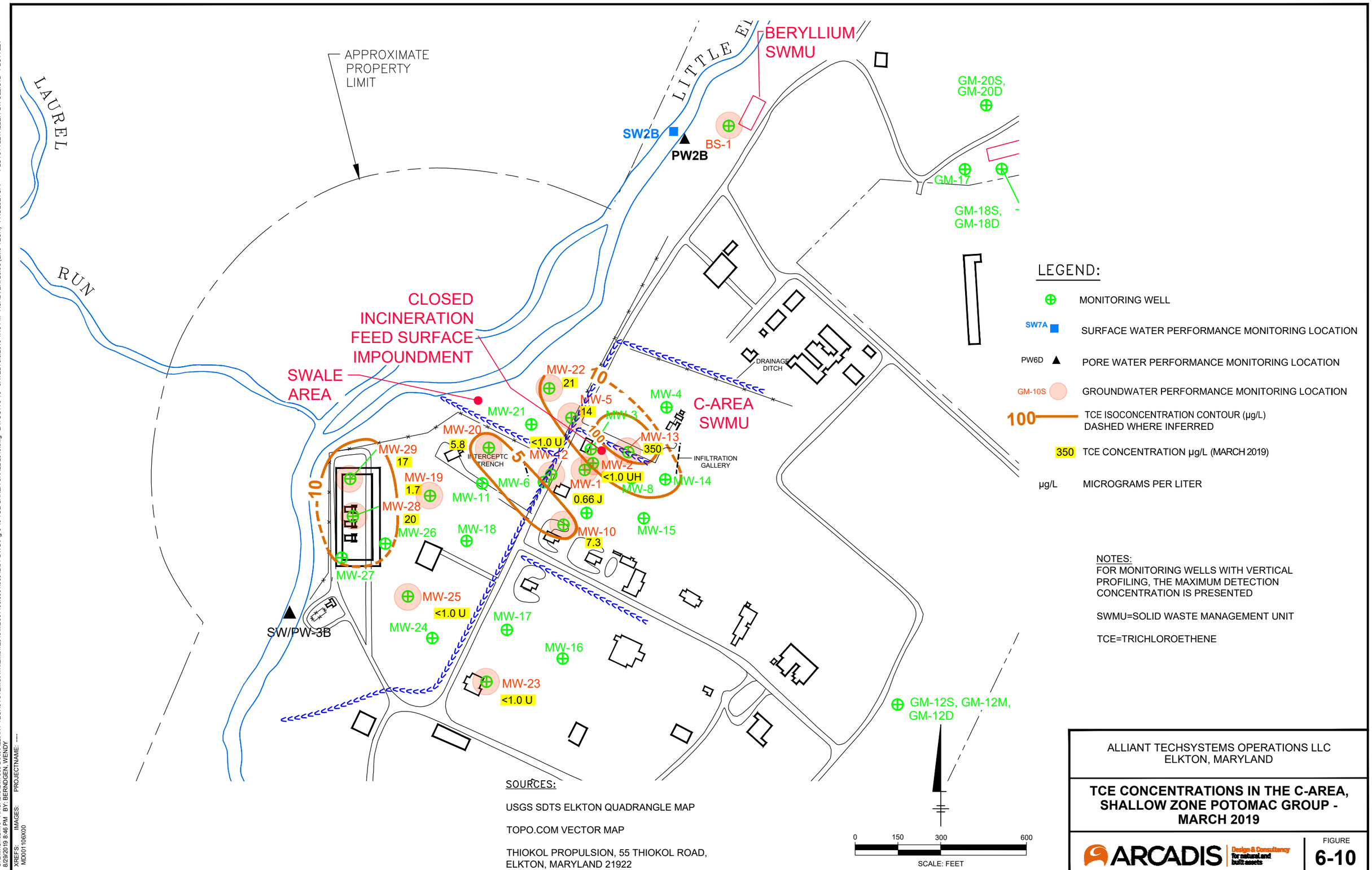

LEGEND:

- ⊕ MONITORING WELL
- SW7A ■ SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D ▲ PORE WATER PERFORMANCE MONITORING LOCATION
- GM-10S ⬤ GROUNDWATER PERFORMANCE MONITORING LOCATION
- 100 TCE ISOCONCENTRATION CONTOUR (µg/L) DASHED WHERE INFERRED
- 350 TCE CONCENTRATION µg/L (MARCH 2019)
- µg/L MICROGRAMS PER LITER

NOTES:
FOR MONITORING WELLS WITH VERTICAL PROFILING, THE MAXIMUM DETECTION CONCENTRATION IS PRESENTED

SWMU=SOLID WASTE MANAGEMENT UNIT

TCE=TRICHLOROETHENE

SOURCES:

USGS SDTS ELKTON QUADRANGLE MAP

TOPO.COM VECTOR MAP

THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ALLIANT TECHSYSTEMS OPERATIONS LLC
ELKTON, MARYLAND

TCE CONCENTRATIONS IN THE C-AREA, SHALLOW ZONE POTOMAC GROUP - MARCH 2019

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FIGURE 6-10

C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ALLIANT TECHSYSTEMS\ATK\Elkton\2019\MD001106.0001.00012\01-DWG\Fig 6-10 TCE CAREA SHALL 2019.dwg LAYOUT: 6-10 SAVED: 8/6/2019 1:19 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 8/29/2019 8:46 PM BY: BERNDGEN, WENDY
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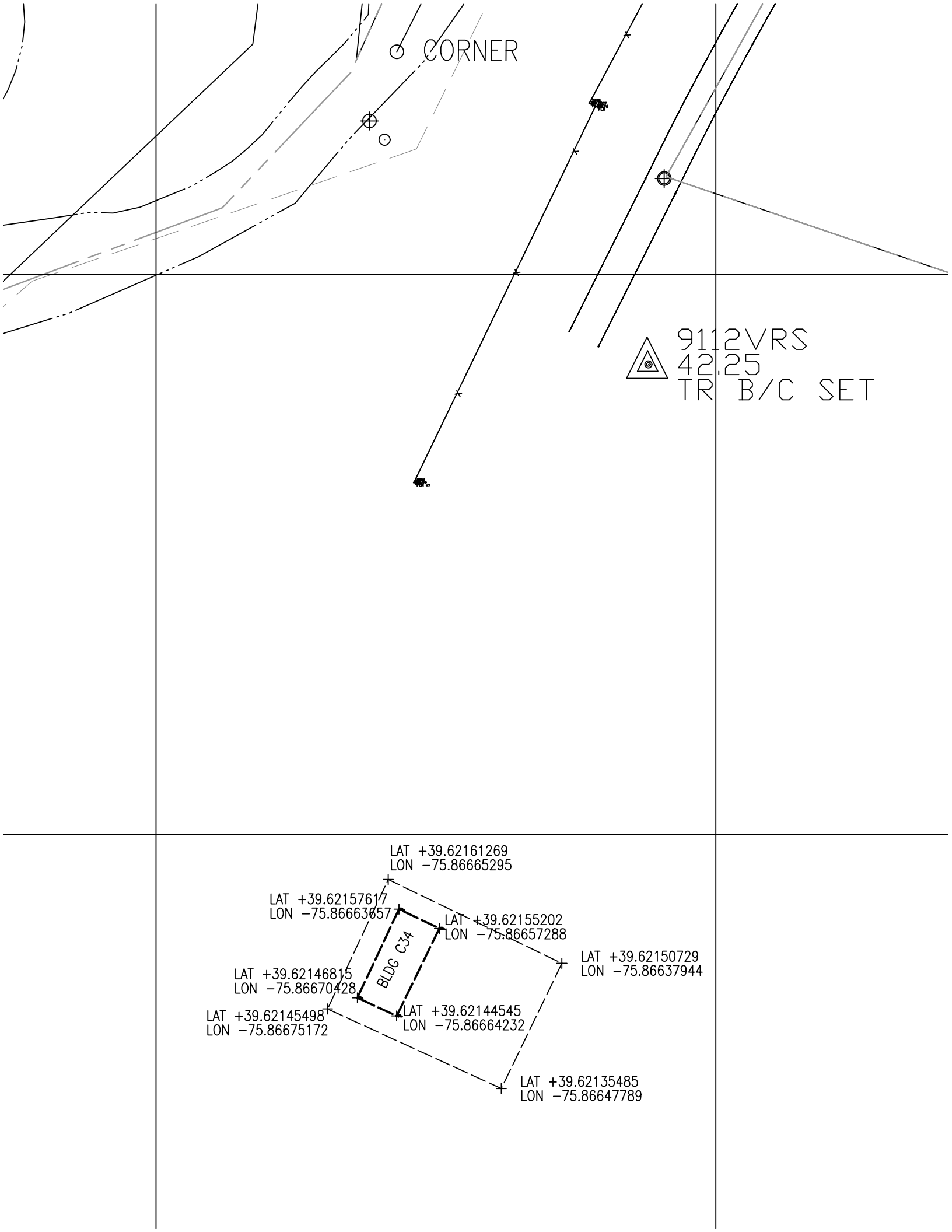
APPENDIX A

Soil Excavation Restriction Area Exhibits – Beryllium and A-Area SWMUs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LON −75.86675172
LAT +39.62144545
LON −75.86664232
LAT +39.62135485
LON −75.86647789

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Building C34 SWMU

Part of Cecil County Tax Map 0305, Grid 0020 (SWMU actually located in Grid 0014), Parcel 0482, Tax Account No. 03-069052 – BEING Part of that tract or parcel of land conveyed by Trinco, Inc. to Thiokol Corporation by a deed dated January 25, 1978 as recorded among the land records of Cecil County in Liber NDS 11, folio 612.

5395 Square Foot Parcel of Land, Surveyed for Northrop Grumman Innovation Systems, Inc., Located at 55 Thiokol Road, Third Election District, Cecil County, Maryland

BEGINNING for the same at the corner of a stake heretofore set in August 2018 lying South 18°27'19" West 1008.82 feet from a rebar heretofore set with identifying cap 'FWA-4' at the end of the fifth or radius 1285 feet arc length 2293.62 feet course of Parcel No. 3 of those tracts or parcels of land conveyed by Marva Limited Partnership to Thiokol Propulsion, a Business of Cordant Technologies, Inc. by a deed dated June 3, 1998 as recorded among the land records of Cecil County in Liber WLB 723, folio 486 and shown on Minor Subdivision Plat No. 3069 on file at the Cecil County Office of Planning and Zoning and lying South 83°14'53" West 784.08 feet from a bent iron pipe heretofore set at the beginning of Parcel No. II of those tracts or parcels of land conveyed by Chemtron Corporation to Thiokol Chemical Corporation be a deed dated November 26, 1969 as recorded among the land records of Cecil County in Liber WAS 248, folio 82. Said point of beginning also lies North 19°50'39" West 14.08 feet from the northernmost corner of Building C34 located within the outlines of the herein described parcel. Said point of beginning bears coordinates, referenced to the Maryland Coordinate System (NAD83/2011) of North 713979.8010 and East 1631603.7300 and WGS84 Latitude +39.62161269 and Longitude -75.86665295. Thence, from the point of beginning, with bearings referenced to the Maryland Coordinate System,

1) South 64°13'34" East 86.09 feet to a stake heretofore set (+39.62150729, -75.86637944)

2) South 25°49'41" West 62.07 feet to a stake heretofore set (+39.62135485, -75.86647789)

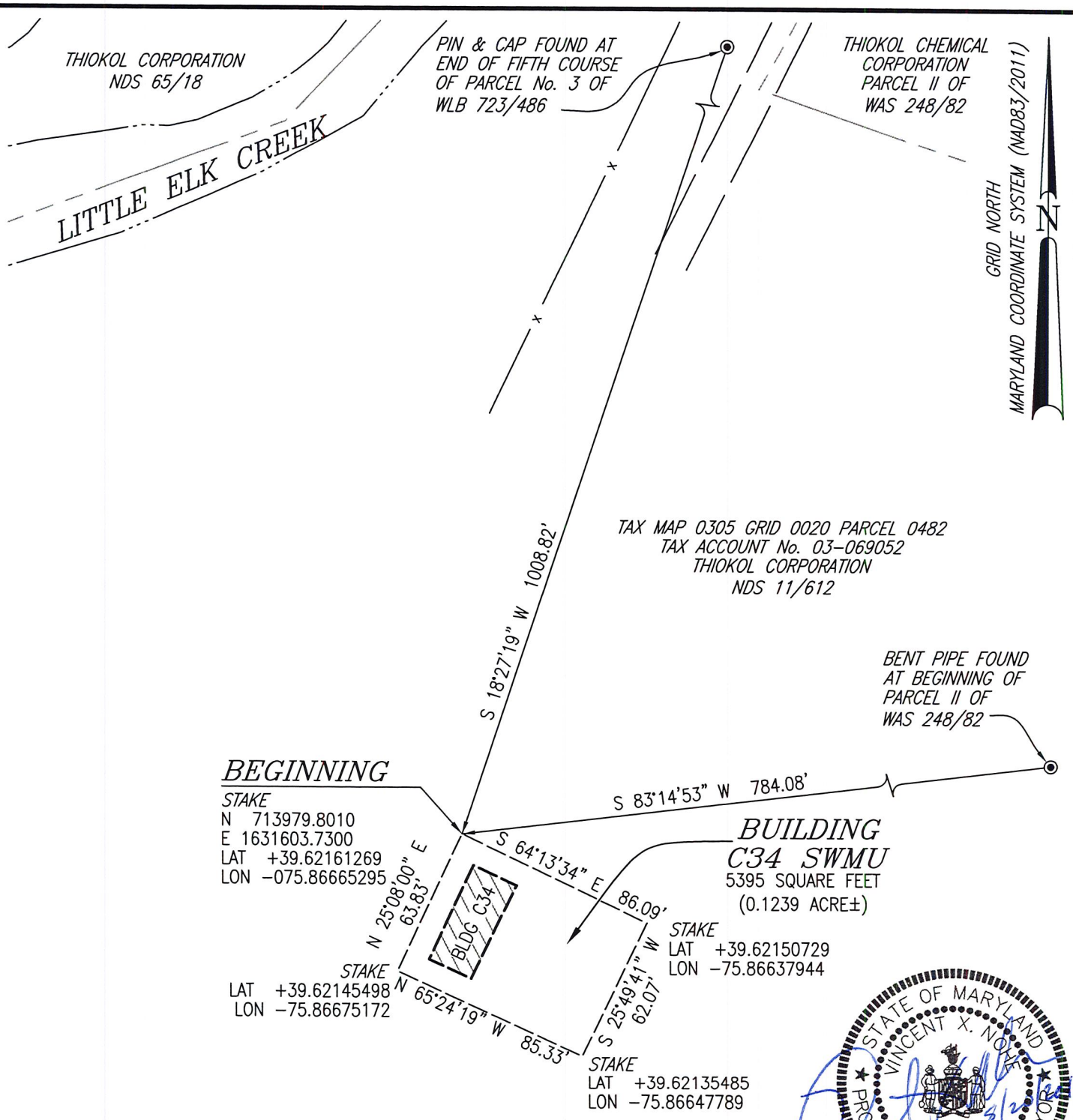
3) North 65°24'19" West 85.33 feet to a stake heretofore set (+39.62145498, -75.86675172)

4) North 25°08'00" East 63.83 feet to the point of beginning hereof.

CONTAINING 5395 square feet (0.1239 acre) of land, more or less.

THIS PARTICULAR DESCRIPTION was prepared by Vincent X. Nohe, a Professional Land Surveyor in the State of Maryland and in accordance with the Minimum Standards of Practice for Land Surveyors of the Annotated Code of Maryland. My current license expires August 8, 2020.

STATE OF MARYLAND
VINCENT X. NOHE
No. 305
REGISTERED
PROFESSIONAL LAND SURVEYOR
8/2/19



THIS EXHIBIT DRAWING AND THE FIELD SURVEYS ON WHICH IT IS BASED WERE PREPARED WITHOUT THE BENEFIT OF A TITLE EXAMINATION OR ABSTRACT.

I HEREBY CERTIFY THAT A PROFESSIONAL LAND SURVEYOR WAS IN RESPONSIBLE CHARGE OVER THE PREPARATION OF THIS EXHIBIT DRAWING AND THE FIELD SURVEYS MADE ON THE GROUND ON WHICH IT IS BASED BEGINNING IN MAY, 2018 THROUGH MARCH, 2019 AND WAS MADE IN ACCORDANCE WITH THE MINIMUM STANDARDS OF PRACTICE FOR LAND SURVEYORS OF THE CODE OF MARYLAND REGULATIONS (09.13.06.12).

STATE OF MARYLAND
VINCENT X. NOHE
No. 308
REGISTERED
PROFESSIONAL LAND SURVEYOR

VINCENT X. NOHE
REG. PROF. LS No. 308
MY CURRENT LICENSE
EXPIRES AUGUST 8, 2020

SCALE	DATE
1"= 60'	08/20/19
DRAWN BY	CHECKED BY
VXN	
PLAT NUMBER	FWA JOB NUMBER
	2171115.02

FREDERICK WARD ASSOCIATES
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P.O. Box 727, 5 South Main Street
Bel Air Maryland 21014 - 0727
410-838-7900
410-893-1243 fax

EXHIBIT TO ACCOMPANY PARTICULAR DESCRIPTION OF RESTRICTED AREA

BUILDING C34 SWMU

LOCATED AT 55 THIOKOL ROAD
THIRD ELECTION DISTRICT
CECIL COUNTY, MARYLAND

M:\Projects\2171115.00 GEI ATK Elkton Control and Topo\Surveys\CAD\PExhibit Restricted Areas.dwg

FREDERICK WARD ASSOCIATES

5 South Main Street
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Bel Air, Maryland 21014
410-838-7900

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A-Area SWMU

PART OF Cecil County Tax Map 0309, Grid 0015 (SWMU actually partially located in Grids 0009, 0015, 0016 & 0021), Parcel 0169, Tax Account No. 03-032183 – BEING part of that tract or parcel of land conveyed by The Elk Corporation to Thiokol Chemical Corporation by a deed dated December 14, 1954 as recorded among the land records of Cecil County in Liber WAS 2, folio 431.

PART OF Cecil County Tax Map 0309, Grid 0016 (SWMU actually partially located in Grids 0009, 0010 & 0016), Parcel 0446, Tax Account No. 03-032213 - BEING part of that tract or parcel of land conveyed by Trinco, Inc. to Thiokol Corporation by a deed dated May 20, 1975 as recorded among the land records of Cecil County in Liber WAS 346, folio 849.

PART OF Cecil County Tax Map 0551, Grid 0017 (SWMU actually partially located in Grids 0016, 0021 & 0022), Parcel 0551, Tax Account No. 03-011690 - BEING part of that tract or parcel of land conveyed by Gilpin Manor Development Corporation, Inc. to Thiokol Corporation by a deed dated June 30, 1983 as recorded among the land records or Cecil County in Liber NDS 99, folio 328 and subsequently conveyed by Charles M. Huester, Katherine H. Benner and Barbara H. Higgins, the surviving directors and trustees of Gilpin Manor Development Corporation, Inc. to Thiokol Corporation by a Confirmatory Deed dated October 28, 1991 as recorded among the land records of Cecil County in Liber NDS 359, folio 266.

17.7244 Acre Parcel of Land, Surveyed for Northrop Grumman Innovation Systems, Inc., Located at 55 Thiokol Road, Third Election District, Cecil County, Maryland

BEGINNING for the same at a wood stake marked E-2 heretofore set south of the easement conveyed by Triumph Explosives, Inc. to The Philadelphia, Baltimore and Washington Railroad Company by a deed dated June 11, 1943 as recorded among the land records of Cecil County in Liber RRC 1, folio 153 lying South 80°13'37" West 31.58 feet from a metal fence post on the south side of the former location of the railroad siding. Said point of beginning also lying North 17°15'51" West 99.94 feet from a rebar heretofore set with identifying cap 'FWA-4' at the beginning of the twenty-first or South 63°49'27" West 267.43 feet course of that tract or parcel of land conveyed by Gilpin Manor Development Corporation, Inc. to Thiokol Corporation by a deed dated June 30, 1983 as recorded among the land records or Cecil County in Liber NDS 99, folio 328 and lying South 57°26'17" West 303.14 feet from an iron pipe heretofore set at the end of the fifth or North 56°12'32" East 233.96 feet course of said conveyance. Said point of beginning bears coordinates, referenced to the Maryland Coordinate System (NAD83/2011) of North 710338.1382 and East 1634198.9040 and WGS84 Latitude +39.61152763 and Longitude -075.85760331. Thence, from the point of beginning, with bearings referenced to the Maryland Coordinate System,

1) South 41°40'32" West, crossing the fourth course of the said conveyance unto Thiokol, 289.61 feet to a wood stake marked E-1 heretofore set (+39.61094046, -075.85829631) lying North 00°12'06" W 24.18 feet from the corner of a chain link fence and lying North 06°28'06" West 33.79 feet from a rebar heretofore set at the end of the aforesaid twenty-first course of the conveyance unto Thiokol recorded in Liber NDS 99, folio 328,

2) South 00°55'43" West 400.19 feet to wood stake heretofore set, (+39.60984232, -075.85833709)

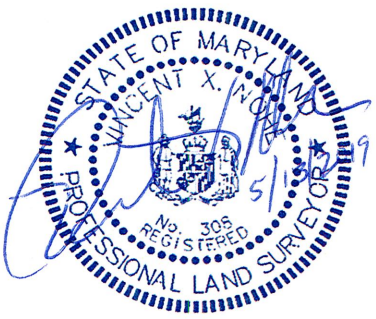
3) South 89°37'18" West, again crossing the fourth course of the said conveyance unto Thiokol, 768.78 feet to wood stake heretofore set, (+39.60985475, -075.86106553) lying North 00°36'50" West 74.58 feet from the corner of a chain link fence and lying North 02°24'26.9906" East 83.14 feet from a square iron pin heretofore set at the end of the third course of the said conveyance unto Thiokol recorded in Liber NDS 99, folio 328,

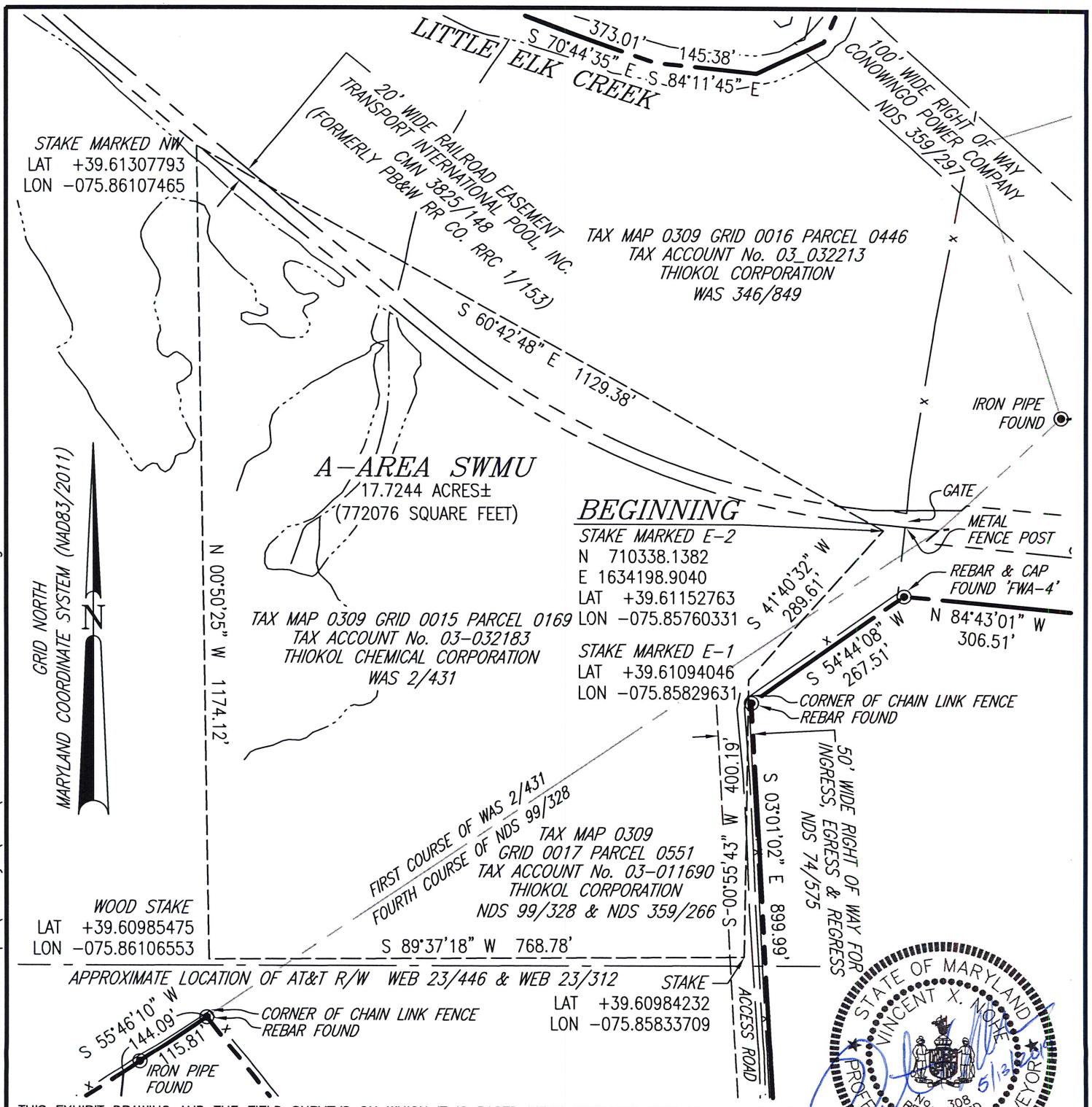
4) North 00°50'25" West 1174.12 feet to a wood stake marked NW heretofore set south of the aforesaid easement conveyed by Triumph Explosives, Inc. to The Philadelphia, Baltimore and Washington Railroad Company, (+39.61307793, -075.86107465).

5) South 60°42'48" East, crossing the aforesaid easement conveyed by Triumph Explosives, Inc. to The Philadelphia, Baltimore and Washington Railroad Company, 1129.38 feet to the point of beginning hereof.

CONTAINING 17.7244 acre (772076 square feet) of land, more or less.

THIS PARTICULAR DESCRIPTION was prepared by Vincent X. Nohe, a Professional Land Surveyor in the State of Maryland and in accordance with the Minimum Standards of Practice for Land Surveyors of the Annotated Code of Maryland. My current license expires August 8, 2020.





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STATE OF MARYLAND
VINCENT X. NOHE
No. 308
REGISTERED
PROFESSIONAL LAND SURVEYOR
5/13/19

VINCENT X. NOHE
REG. PROF. LS No. 308
MY CURRENT LICENSE
EXPIRES AUGUST 8, 2020

SCALE 1"= 200'	DATE 03/26/19
DRAWN BY VXN	CHECKED BY
PLAT NUMBER	FWA JOB NUMBER 2171115.02

FREDERICK WARD ASSOCIATES
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Bel Air Maryland 21014 - 0727
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EXHIBIT TO ACCOMPANY PARTICULAR DESCRIPTION OF RESTRICTED AREA

A-AREA SWMU

LOCATED AT 55 THIOKOL ROAD
THIRD ELECTION DISTRICT
CECIL COUNTY, MARYLAND

M:\Projects\2171115.00 GEI ATK Elkton Control and Topo\Surveys\CAD\PExhibit Restricted Areas.dwg

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Bel Air, Maryland 21014
410-838-7900

www.frederickward.com

Beryllium SWMU

Part of Cecil County Tax Map 0305, Grid 0020 (SWMU actually located in Grid 0008), Parcel 0482, Tax Account No. 03-069052 – BEING Part of that tract or parcel of land conveyed by Trinco, Inc. to Thiokol Corporation by a deed dated January 25, 1978 as recorded among the land records of Cecil County in Liber NDS 11, folio 612.

22050 Square Foot Parcel of Land, Surveyed for Northrop Grumman Innovation Systems, Inc., Located at 55 Thiokol Road, Third Election District, Cecil County, Maryland

BEGINNING for the same at the corner of a chain link fence lying North 52°21'05" East 240.68 feet from a rebar heretofore set with identifying cap 'FWA-4' at the end of the fifth or radius 1285 feet arc length 2293.62 feet course of Parcel No. 3 of those tracts or parcels of land conveyed by Marva Limited Partnership to Thiokol Propulsion, a Business of Cordant Technologies, Inc. by a deed dated June 3, 1998 as recorded among the land records of Cecil County in Liber WLB 723, folio 486 and shown on Minor Subdivision Plat No. 3069 on file at the Cecil County Office of Planning and Zoning and lying North 54°39'39" West 531.79 feet from the a metal fence post in concrete heretofore set at the end of the twenty-ninth or South 55°17'00" West 324.58 feet course of that tract or parcel of land conveyed by Trinco, Inc. to Thiokol Corporation by a deed dated January 25, 1978 as recorded among the land records of Cecil County in Liber NDS 11, folio 612 and shown on Minor Subdivision Plat No. 333 on file at the Cecil County Office of Planning and Zoning. Said point of beginning bears coordinates, referenced to the Maryland Coordinate System (NAD83/2011) of North 715083.7555 and East 1632113.6510 and WGS84 Latitude +39.62462561 and Longitude -075.86479429. Thence, from the point of beginning and binding on the said chain link fence as now existing, with bearings referenced to the Maryland Coordinate System,

1) North 31°37'22" East, crossing that strip or right of way conveyed by Thiokol Corporation to Conowingo Power Company by an indenture dated October 28, 1991 as recorded among the land records of Cecil County in Liber NDS 359, folio 297, 158.74 feet to the corner of a chain link fence, (+39.62499380, -075.86449288)

2) North 59°16'19" East 78.57 feet to the corner of a chain link fence, (+39.62510169, -075.86425138)

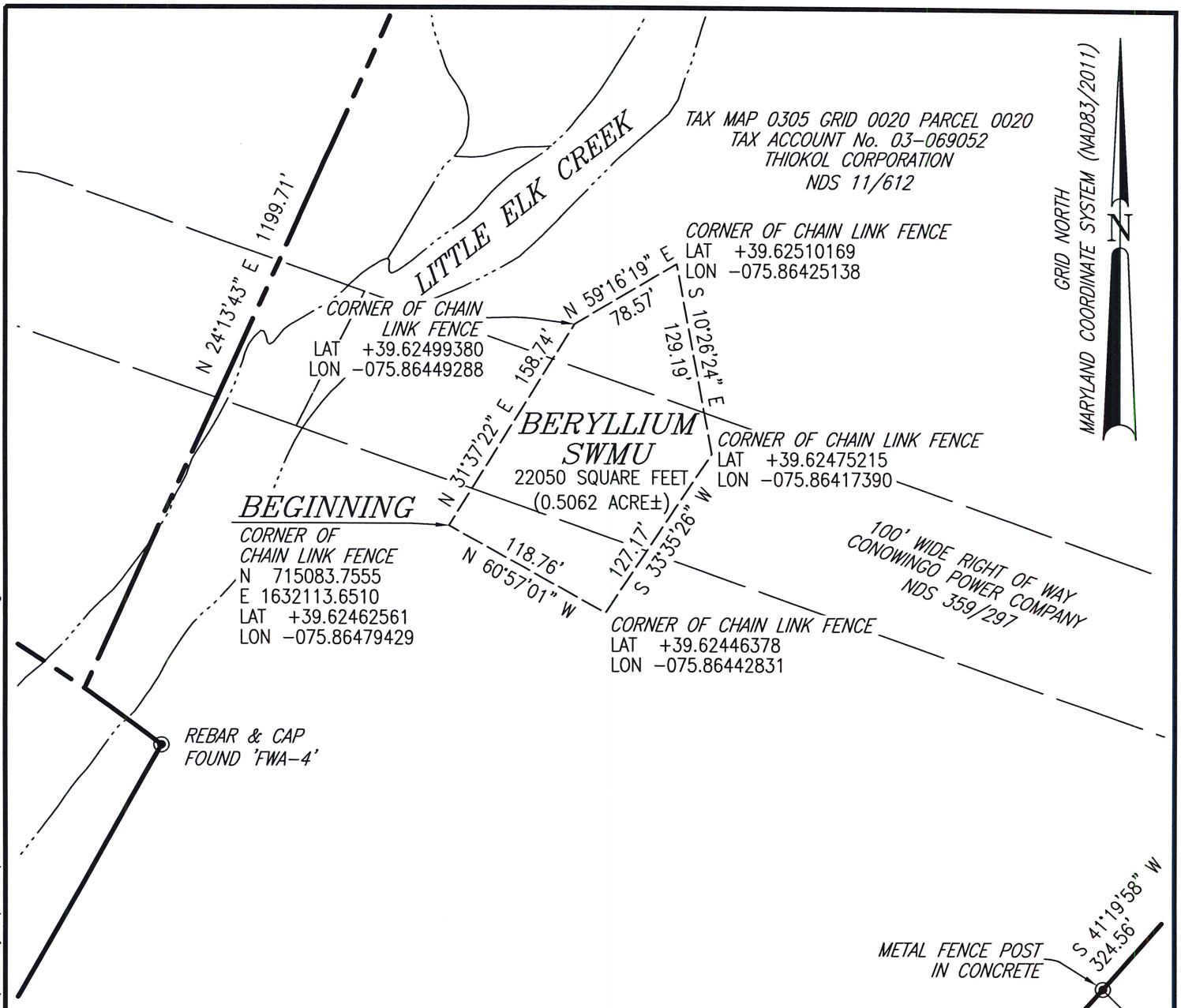
3) South 10°26'24" East, crossing into the said Conowingo Power Company right of way, 129.19 feet to the corner of a chain link fence, (+39.62475215, -075.86417390)

4) South 33°35'26" West, crossing out of the said Conowingo Power Company right of way, 127.17 feet to the corner of a chain link fence, (+39.62446378, -075.86442831)

5) North 60°57'01" West 118.76 feet to the point of beginning hereof.

CONTAINING 22050 square feet (0.5062 acre) of land, more or less.

THIS PARTICULAR DESCRIPTION was prepared by Vincent X. Nohe, a Professional Land Surveyor in the State of Maryland and in accordance with the Minimum Standards of Practice for Land Surveyors of the Annotated Code of Maryland. My current license expires August 8, 2020.



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STATE OF MARYLAND
VINCENT X. NOHE
No. 308
REGISTERED
PROFESSIONAL LAND SURVEYOR

5/13/19

VINCENT X. NOHE
REG. PROF. LS No. 308
MY CURRENT LICENSE
EXPIRES AUGUST 8, 2020

SCALE: 1"= 100'	DATE: 03/26/19
DRAWN BY: VXN	CHECKED BY:
PLAT NUMBER:	FWA JOB NUMBER: 2171115.02

FREDERICK WARD ASSOCIATES
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EXHIBIT TO ACCOMPANY PARTICULAR DESCRIPTION OF RESTRICTED AREA

BERYLLIUM SWMU

LOCATED AT 55 THIOKOL ROAD
THIRD ELECTION DISTRICT
CECIL COUNTY, MARYLAND

M:\Projects\2171115.00 GEI ATK Elkton Control and Topo\Surveys\CAD\PExhibit Restricted Areas.dwg

APPENDIX B

Field Logs

Instrument Calibration Log

Project Name: _____

Project Number: ATK

Calibrating Personnel: A. Field

Time of Calibration: 0933

Weather Conditions: sunny ~30°F

Barometric Pressure: _____ mm Hg

Date: 3-19-19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba			~~3.96~~	0835	9.36
pH 4.00	↓		4.0	3.96	↓	↓
Conductivity (4.49)	↓		4.49	4.54		
Turbidity (1.0 NTU)	LaMotte	0.80	1.0	1.0		
Turbidity (10.0 NTU)	↓	11.44	10.0	10.0		
DO (mg/L)	--	--	--	--	↓	↓
DO%	Horiba			9.80		
ORP (mV)	↓			283	↓	✓

Notes:

Calibration log_New Brand.xls
Inst Calibration

ARCADIS

Instrument Calibration Log

Project Name: ATKOrbital

Project Number:

Calibrating Personnel: K. Morrison

Time of Calibration: 0830

Weather Conditions: Cold, Sunny

Barometric Pressure: _____ mm Hg

Date: 3/19/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00		[illegible]	[illegible]	[illegible]		
pH 4.01		3.99	4	4.27	0830	
Conductivity (_____)		2.26	4.49	2.26	0830	
Turbidity (1.0 NTU)		0	0	0	0830	
Turbidity (10.0 NTU)						
DO (mg/L)		10.36		10.44	0830	
DO%		96.4		96.8	0830	
ORP (mV)						

Notes:

Lamotte calibration: 10 NTU Measured: 9.98 NTU
1 NTU " : 1.44 NTU
0 NTU " : -.1 NTU

Instrument Calibration Log

Project Name: ATK

Project Number:

Calibrating Personnel: A. Feild

Time of Calibration: 0815

Weather Conditions: partly cloudy ~ 40°F

Barometric Pressure: _____ mm Hg

Date: 3-20-19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba		—		0820	10.80
pH 4.00	↓		4.0	4.0	↓	↓
Conductivity (4.49)	↓		4.49	4.57	↓	↓
Turbidity (1.0 NTU)	LaMotte	0.3	1.0	1.06	↓	↓
Turbidity (10.0 NTU)	LaMotte	8.64	10.0	10.0	↓	↓
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		100.0	10.46	↓	↓
ORP (mV)	↓		240.0	321	↓	↓

Notes:

ARCADIS

Instrument Calibration Log

Project Name: ATK Orbital

Project Number:

Calibrating Personnel: K. Morrison

Time of Calibration: 0815

Weather Conditions: Cold, sunny

Barometric Pressure: _____ mm Hg

Date: 3/20/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00						
pH 4.01		3.99	4	3.96	0815	
Conductivity (_____)		4.54	4.49	4.55		
Turbidity (1.0 NTU)		1.57	1	1.51		
Turbidity (10.0 NTU)		9.93	10	9.52		
DO (mg/L)		11.25				
DO%						
ORP (mV)						

LaMotte

Notes:

Instrument Calibration Log

Project Name: ATK

Project Number: MD001006.0006

Calibrating Personnel: A. Feild

Time of Calibration: 0955

Weather Conditions: rainy ~ 40°F

Barometric Pressure: _____ mm Hg

Date: 3-21-19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba				1001	12.01
pH 4.00	↓		4.0	3.98	↓	↓
Conductivity (_____)	↓			4.52		
Turbidity (1.0 NTU)	LaMotte	0.85	1.0	1.50		
Turbidity (10.0 NTU)	↓	8.30	10.0	10.0		
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		10.0	9.94		
ORP (mV)	↓		240.0	315		

Notes:

Calibration log_New Brand.xls
Inst Calibration

Instrument Calibration Log

Project Name: ATK

Project Number: MD001006.0006

Calibrating Personnel: A. Feild

Time of Calibration:

Weather Conditions: rainy ~ 50°F

Barometric Pressure: _____ mm Hg

Date: 3-21-19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba		—			
pH 4.00	↓		4.0			
Conductivity (_____)	↓					
Turbidity (1.0 NTU)	LaMotte					
Turbidity (10.0 NTU)	↓					
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		10.0			
ORP (mV)	↓		240.0			

Notes:

ARCADIS

Instrument Calibration Log

Project Name: ATK orbital

Project Number:

Calibrating Personnel: K. Morrison

Time of Calibration: 0850

Weather Conditions: windy cold cloudy

Barometric Pressure: _____ mm Hg

Date: 3/22/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00		8				
pH 4.01	Horiba	3.96	4	3.99	0850	
Conductivity (_____)	Horiba	4.55	4.49	4.54	0850	
Turbidity (1.0 NTU)	Lamotte	2.63	1	1.26	0850	
Turbidity (10.0 NTU)	Lamotte	10.71	10	10.02	0850	
DO (mg/L)	Horiba	13.10	—	9.77	0850	
DO%						
ORP (mV)						

Notes:

Instrument Calibration Log

Project Name: ATK Orbital

Project Number: MD001006.0006

Date: 3-22-19

Calibrating Personnel: A. Feild

Time of Calibration: 0920

Weather Conditions: cloudy / windy ~ 50°F

Barometric Pressure: _____ mm Hg

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba		—		0922	0837
pH 4.00	↓		4.0	3.97		
Conductivity (4.49)	↓		4.49	4.55		
Turbidity (1.0 NTU)	LaMotte	0.63	1.0	1.15		
Turbidity (10.0 NTU)	↓	8.62	10.0	10.0		
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		10.0	11.60		
ORP (mV)	↓		240.0	314		

Notes:

ARCADIS

Instrument Calibration Log

Project Name: ATK orbital

Project Number:

Calibrating Personnel: C. Morrison

Time of Calibration: 0750

Weather Conditions: sunny, chilly

Barometric Pressure: _____ mm Hg

Date: 3/25/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00						
pH 4.01		3.90	4	3.99	0752	
Conductivity (_____)		4.76	4.49	4.52		
Turbidity (1.0 NTU)	Lamotte	0.89		1.15		
Turbidity (10.0 NTU)	Lamotte	9.72	10	10.0		
DO (mg/L)			10.43	10.20		
DO%			102.#	100.6%		
ORP (mV)						

Notes:

ARCADIS Design & Consultancy for natural and built assets

Instrument Calibration Log

Project Name: ATK Orbital

Date: 3/25/19

Project Number: MD001006.0006

Calibrating Personnel: A. Feild

Time of Calibration: 0750

Weather Conditions: sunny 25's°F

Barometric Pressure: _____ mm Hg

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba				0755	13.69
pH 4.00	↓		4.0	3.93	↓	↓
Conductivity (_____)	↓		4.49	4.50		
Turbidity (1.0 NTU)	LaMotte	0.83	1.0	7.0		
Turbidity (10.0 NTU)	↓	10.18	10.0	10.0		
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		10.0	10.42	↓	
ORP (mV)	↓		240.0	309		↓

Notes:

Instrument Calibration Log

Project Name: ATK Orbital

Project Number: MD001006.0006

Calibrating Personnel: A. Feild

Time of Calibration: 0740

Weather Conditions: Sunny ~ 30°F

Barometric Pressure: _____ mm Hg

Date: 3/26/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba				0743	11.09
pH 4.00	↓		4.0	4.03		
Conductivity (_____)	↓		4.49	4.49		
Turbidity (1.0 NTU)	LaMotte	0.06	1.0	0.16		
Turbidity (10.0 NTU)	↓	10.99	10.0	10.00		
DO (mg/L)	--	--	--	--	--	--
DO%	Horiba		10.0	100.8		↓
ORP (mV)	↓		240.0	316	↓	

Notes:

ARCADIS

Instrument Calibration Log

Project Name: ATK Orbital

Project Number:

Calibrating Personnel: K. Morrison

Time of Calibration: 0740

Weather Conditions: Cold, Sunny

Barometric Pressure: _____ mm Hg

Date: 3/26/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00					0740	
pH 4.01		3.83	4	4.05		
Conductivity (4.49)		5.22	4.49	4.44		
Turbidity (1.0 NTU)	Lamotte	1.34	1	1.2		
Turbidity (10.0 NTU)	Lamotte	9.56	10	10.1		
DO (mg/L)		10.71		9.44		
DO%		79.1		85.4		
ORP (mV)						

Notes:

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Instrument Calibration Log

Project Name: ATK orbital

Project Number: MD001006.0006

Calibrating Personnel: KM

Time of Calibration: 0800

Weather Conditions: cold, sunny

Barometric Pressure: _____ mm Hg

Date: 3/27/19

CALIBRANT	INSTRUMENT	INITIAL READING	VALUE ENTERED	FINAL READING	TIME	TEMP
pH 7.00	Horiba				0800	
pH 4.01	Horiba	5.76	4	3.99		
Conductivity (4.49)	Horiba	4.95	4.49	4.56		
Turbidity (1.0 NTU)	Lamotte	0.55	1	1.04		
Turbidity (10.0 NTU)	Lamotte	~~8.46~~	10	10.13		
DO (mg/L)	Horiba	10.57	~~8~~	10.84		
DO%	Horiba					
ORP (mV)						

Notes:

ARCADIS | Design & Consultancy for natural and built assets

Water Level Measurement Form

Project Name: ATK Orbital
Project Number: MD001006.0006
Field Personnel: AF/KM

Date: 3/18/19
Weather: Low 40°F cloudy

Well Casing Volumes

gallon/foot				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

	Well ID	Time	Measuring Point	TSD (ft)	DTP (ft)	DTW (ft)	Notes
	BS-1	1142	TOC	18.85	—	7.67	
	MW-1	1228	TOC	15.79		5.44	
	MW-2	1217	TOC	14.21		4.89	
	MW-5	1203	TOC	13.48		5.67	
	MW-10	1250	TOC	17.58		5.34	
	MW-11	1432	TOC	14.18		4.30	
	MW-12	1209	TOC	11.45		4.13	
	MW-13	1225	TOC	17.01		4.52	
	MW-19	1304	TOC	15.58		5.62	
	MW-20	1234	TOC	13.14		5.23	
	MW-22	1241	TOC	17.10		7.02	
	MW-23	1127	TOC	17.10		7.35	
	MW-25	1300	TOC	15.04		5.03	
3/22	MW-28	0930	TOC	16.94		5.56	
3/22	MW-29	1045	TOC	16.47		6.42	
	GM-1B	1341	TOC	51.84		14.80	
3/26	GM-2B	1430	TOC	44.62		27.73	not a monitoring well
3/19	GM-4B	1247	TOC	50.79		6.15	
	GM-9M	1118	TOC	60.03		17.26	
	GM-10S	1050	TOC	19.69		9.94	
	GM-14M	1357	TOC	84.40		28.06	
	GM-14S	1359	TOP	68.61	—	30.47	

Notes:

Water Level Measurement Form

Project Name: ATK Orbital
Project Number: MD001006.0006
Field Personnel: AF/KM

Date: 3/18/19
Weather: Low 40s °F cloudy

Well Casing Volumes

gallon/foot			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

	Well ID	Time	Measuring Point	TSD (ft)	DTP (ft)	DTW (ft)	Notes
3/19	GM-15M	1205	TOC	46.85	—	11.61	
	GM-16M	1529	TOC	99.05		0.0	water above casing in pipe
	GM-16S	1529	TOC	33.62		0.0	" "
	GM-21M	1626	TOC	52.80		1.86	
3/25	GM-21S	1340	TOC	27.35		3.97	
	GM-22M	1615	TOC	38.75		5.88	
	GM-22S	1618	TOC	22.71		7.57	
	GM-24	1412	TOC	90.99		33.08	
	GM-26M	1652	TOC	92.27		32.98	
	GM-26S	1648	TOC	22.74		7.57	
	GM-27	1552	TOC	17.79		8.02	
	GM-30M	1025	TOC	19.74		9.86	
	GM-31M	1502	TOC	90.02		21.08	
	GM-31S	1500	TOC	13.93		3.05	
3/25	GM-32	0907	TOC	33.51		5.64	
3/25	GM-32D	0907	TOC	57.70		5.30	

Notes:

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Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID BS-1 | Date 3-22-19

Project Name/Location ATK Orbital | Weather windy ~40°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4" | Well Material ☒ PVC ☐ SS ☐ Other

Total Depth (ft-bmp) 18.85 | Static Water Level (ft-bmp) 7.67 | Water Column in Well 11.18 | Gallons in Well 7.267

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal | Sample Method Low flow

Gallons Purged | MP Elevation -- | Submersible Bladder Pump | Pump On/Off 1141 / 1250

Sample Time: Label 1230 | Replicate/ Code No. - | Disp. Bailer / Other | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1144	0	250	6.25	-	6.32	0.299	37.5	0.00	9.66	147	none	none
1149	5	250	6.26	-	6.56	0.308	31.6	0.00	8.89	55	"	"
1154	10	250	6.23	-	6.59	0.308	25.9	0.00	8.71	50	"	"
1159	15	250	6.23	-	6.61	0.307	21.3	0.00	8.60	50	"	"
1204	20	250	6.23	-	6.62	0.307	16.5	0.00	8.56	56	"	"
1209	25	250	6.23	-	6.63	0.306	16.9	0.00	8.59	62	"	"
1214	30	250	6.23	-	6.63	0.306	12.5	0.00	8.58	63	"	"
1219	35	250	6.23	-	6.64	0.305	12.7	0.00	8.49	63	"	"
1224	40	250	6.23	-	6.64	0.305	12.2	0.00	8.49	60	"	"
					Sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
SVOC	1L Amber	1	none
Metals	250mL Plastic	1	HNO_3
Sulfate	125mL Plastic	1	none
TOC	40mL VOA	3	H_2SO_4
Dissolved Iron	250mL Plastic	1	HNO_3

Well Information

Well Location: verified by map | Well Locked at Arrival: ☒ Yes / ☐ No

Condition of Well: good | Well Locked at Departure: ☒ Yes / ☐ No

Well Completion: Flush Mount / ☒ Stick Up | Key Number To Well:

NOTES: Sample ID = ~~MW-5~~ BS-1 (032219) @ 1230

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

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Low Flow Groundwater Sampling Form

Page 1 of ___

Project No. _____ Well ID MW-1 Date 3/20/19

Project Name/Location ATK Orbital Weather sunny, temperate

Measuring Pt. Description TOC Screen Setting (ft-bmp) 27.66-32.66 Casing Diameter (in.) 4 Well Material: V PVC ___ SS ___ Other

Total Depth (ft-bmp) 15.79 Static Water Level (ft-bmp) 5.44 Water Column in Well _____ Gallons in Well _____

Calc. Gallons Purged _____ Pump Intake (ft-bmp) _____ Purge Method: Centrifugal _____ Sample Method Low flow

Gallons Purged _____ MP Elevation _____ Submersible _____

Sample Time: Label 1200 Replicate/ Code No. _____ Disp. Bailer _____ Other _____ Pump On/Off 1120

Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (umhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1120		3/min	5.94		5.54	0.118	5.96	2.76	9.99	237	clear	—
1125	5	↓	6.16		5.49	0.116	3.01	2.76	9.20	240	"	"
1130			6.17		5.49	0.115	2.80	2.77	9.14	241	"	"
1135			6.17		5.46	0.114	3.12	2.68	9.23	242	"	"
1140			6.19		5.43	0.116	3.20	2.62	9.29	245	"	"
1145			6.16		5.43	0.117	3.17	2.59	9.23	246	"	"
1150			6.18		5.42	0.118	3.21	2.56	9.26	247	"	"
1155			6.18		5.42	0.118	3.18	2.55	9.25	248	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	VOAs	3	HCl
perchlorate	plastic 500ml	1	

Well Information

Well Location: _____ Well Locked at Arrival: Yes / No

Condition of Well: _____ Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: _____

NOTES: Good sampled @ 1200

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_flow_GW Samp Form

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Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID MW-2 Date 3/20/19

Project Name/Location ATK orbital Weather Sunny, temperate

Measuring Pt. Description TOC Screen Setting (ft-bmp) 28.98-33.98 Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 14.21 Static Water Level (ft-bmp) 4.89 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal ____ Submersible ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer ____ Other ____ Pump On/Off 1227

Sample Time: Label 1320 Replicate/Code No. ____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1227		75/min	5.07		5.70	0.070	4.63	1.85	10.35	239	clear	—
1232	5		5.37		5.56	0.068	4.87	0.76	9.47	239	"	"
1237			5.44		5.53	0.068	4.12	0.59	10.21	238	"	"
1242			5.42		5.51	0.068	2.99	0.50	10.15	236	"	"
1247			5.43		5.52	0.068	3.04	0.46	10.15	235	"	"
1252			5.45		5.51	0.069	3.08	0.46	10.11	234	"	"
1257 ~~1307~~			5.44		5.51	0.069	3.05	0.39	10.10	234	"	"
1302			5.47		5.52	0.069	2.99	0.29	10.00	234	"	"
1307			5.46		5.49	0.070	2.97	0.31	9.99	235	"	"
1312					5.48	0.070	3.04	0.27	10.04	234	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	VOA 40mL	3(3)	HCL
perchlorate	500mL plastic	(1) 1	—
Sulfate	125mL plastic	1(1)	—
TOC	VOA 40mL	3(3)	Sulfuric Acid
Dissolved Iron	250mL plastic	1(1)	Nitrate

Well Information

Well Location: ____ Well Locked at Arrival: Yes / No

Condition of Well: good rusty Well Locked at Departure: Yes / No

Well Completion: Flush Mount Stick Up Key Number To Well: ____

NOTES: ~~DUP02~~ Dup02(032019) Sampled @ 1320

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.5" = 0.09 2.5" = 0.26 3.5" = 0.50 6" = 1.47
1.25" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

ATK_Field_forms.xls
Low_flow_GW Samp Form

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Groundwater Sampling Form

Page 1 of ____

Project No. MD001006.0000C | Well ID MW-5 | Date 3-22-19

Project Name/Location ATK Orbital | Weather windy ~40°F

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): ____ | Casing Diameter (in.): 4" | Well Material: X PVC, ___ SS, ___ Other

Total Depth (ft-bmp): 13.48 | Static Water Level (ft-bmp): 5.67 | Water Column in Well: 7.81 | Gallons in Well: 5.08

Calc. Gallons Purged: ~20 | Pump Intake (ft-bmp): ____ | Purge Method: Centrifugal ____ / Submersible Bladder Pump / Disp. Bailer ____ / Other ____ | Sample Method: Low flow

Gallons Purged: ____ | MP Elevation: -- | Pump On/Off: 1314 / 1402

Sample Time: Label 1400 | Replicate/ Code No. — | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1316	0	250	3.27	-	6.57	0.211	15.7	6.17	8.81	203	none	none
1321	5	250	3.27	-	6.40	0.214	10.60	5.13	8.61	207	"	"
1326	10	250	3.30	-	6.34	0.209	8.84	5.02	8.51	209	"	"
1331	15	250	3.31	-	6.29	0.215	7.60	4.88	8.45	215	"	"
1336	20	250	3.32	-	6.27	0.226	7.00	4.47	8.45	220	"	"
1341	25	250	3.32	-	6.26	0.230	6.71	4.19	8.43	222	"	"
1346	30	250	3.32	-	6.26	0.237	6.25	3.81	8.41	225	"	"
1351	35	250	3.32	-	6.27	0.239	5.81	3.73	8.48	227	"	"
1356	40	250	3.32	-	6.26	0.242	5.93	3.61	8.42	229	"	"
						sampled						

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none

Well Information

Well Location: verified by map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well: ____

NOTES: sample ID = MW-5 (032219) @ 1400

Well Casing Volumes

Gallons/Foot				
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

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Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID MW-10 Date 3/20/19

Project Name/Location ATK Orbital Weather Sunny, temp ok

Measuring Pt. Description TOC Screen Setting (ft-bmp) 21.84-31.84 Casing Diameter (in.) 4 Well Material: V PVC ___ SS ___ Other

Total Depth (ft-bmp) 37.58 Static Water Level (ft-bmp) 5.34 Water Column in Well ____ Gallons in Well ____

Calc. Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal Submersible ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer ____ Pump On/Off 1502

Sample Time: Label 1545 Replicate/ Code No. ____ Other ____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (umhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1502		75/min	5.54		6.74	0.111	2.01	10.25	16.70	225	clear	—
1507	5		5.65		5.52	0.109	2.35	8.56	16.04	237	"	"
1512			5.62		5.41	0.110	1.30	8.15	15.20	243	"	"
1517			5.64		5.39	0.111	1.47	7.85	14.74	247	"	"
1522			5.63		5.35	0.112	1.43	7.45	14.30	250	"	"
1527			5.63		5.31	0.112	1.67	6.93	14.18	255	"	"
1532			5.63		5.30	0.112	1.72	6.77	14.01	257	"	"
1537			5.64		5.28	0.113	1.70	6.64	13.97	259	"	"
1542					5.24	0.114	1.78	6.59	13.94	263	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOAs	3	HCl
perchlorate	500mL plastic	1	—

Well Information

Well Location: ____ Well Locked at Arrival: Yes / No

Condition of Well: good, rusty Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: ____

NOTES: sampled @ 1545

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_flow_GW Samp Form

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Low Flow Groundwater Sampling Form

Page 1 of 1

Project No. _____ Well ID MW-11 Date 3/22/15

Project Name/Location ATK Orbital Weather cold windy

Measuring Pt. Description TOC Screen Setting (ft-bmp) unknown Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 14.18 Static Water Level (ft-bmp) 4.30 Water Column in Well _____ Gallons in Well _____

Calc.Gallons Purged _____ Pump Intake (ft-bmp) _____ Purge Method: Centrifugal _____ Submersible _____ Sample Method Low flow

Gallons Purged _____ MP Elevation _____ Disp. Bailer _____ Other _____ Pump On/Off 1218/

Sample Time: Label 1300 Replicate/ Code No. _____ Sampled by KCM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1218		100/min	4.30		5.64	0.144	12.5	2.15	16.66	191	clear	—
1223	5		4.46		5.57	0.144	11.5	2.27	10.64	235	"	"
1228			4.48		5.41	0.143	11.2	2.12	10.15	269	"	"
1233			4.45		5.38	0.146	9.88	2.65	1.96	283	"	"
1238			4.46		5.38	0.145	9.40	2.67	10.06	290	"	"
1243			4.46		5.37	0.145	9.62	2.60	10.27	297	"	"
1248			4.46		5.37	0.142	9.79	2.65	10.25	301	"	"
1253			4.46		5.37	0.142	9.79	2.69	10.18	304	"	"
1258			4.46		5.37	0.141	9.65	2.64	10.19	309	"	"

Constituents Sampled	Container	Number	Preservative
TKN	250 plastic	1	sulfuric Acid
Total Nitrate			

Well Information

Well Location: _____ Well Locked at Arrival: Yes / No

Condition of Well: Good Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: _____

NOTES: Sampled @ 1300

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.25	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_Flow_GW Samp Form

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Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID MW-12 | Date 3/20/19

Project Name/Location ATK | Weather Sunny ~50°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4 | Well Material X PVC ___ SS ___ Other

Total Depth (ft-bmp) 11.45 | Static Water Level (ft-bmp) 4.13 | Water Column in Well 7.32 | Gallons in Well 4.76

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal | Sample Method Low flow

Gallons Purged | MP Elevation -- | Submersible Bladder Pump | Pump On/Off 1425/1510

Sample Time: Label 1505 | Replicate/ Code No. ~ | Disp. Bailer / Other | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1428	0	300	4.55	-	7.18	0.282	5.93	2.31	11.22	83	none	none
1433	5	250	4.55	-	7.32	0.283	5.82	0.85	11.02	83	"	"
1438	10	250	4.55	-	7.39	0.284	3.77	0.15	11.00	85	"	"
1443	15	250	4.55	-	7.40	0.284	4.36	0.01	10.93	87	"	"
1448	20	250	4.55	-	7.41	0.283	2.91	0.00	10.99	89	"	"
1453	25	250	4.55	-	7.42	0.283	3.27	0.00	10.86	91	"	"
1458	30	250	4.55	-	7.44	0.283	2.75	0.00	10.84	91	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
See	COC		

Well Information

Well Location: verified by Map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: Sample ID = MW-12 (032019) @ 1505

Well Casing Volumes

Gallons/Foot				
1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

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Low Flow Groundwater Sampling Form

Page 1 of ___

Project No. ___ Well ID MW-19 Date 3/22/19

Project Name/Location ATK Orbital Weather cold, wind

Measuring Pt. Description TOC Screen Setting (ft-bmp) 24.69-34.69 Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 15.58 Static Water Level (ft-bmp) 5.62 Water Column in Well ___ Gallons in Well ___

Calc.Gallons Purged ___ Pump Intake (ft-bmp) ___ Purge Method: Centrifugal Submersible ___ Sample Method Low flow

Gallons Purged ___ MP Elevation ___ Disp. Bailer ___ Pump On/Off 1338/

Sample Time: Label 1445 Replicate/ Code No. ___ Other ___ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1340		75/min	3.39		5.96	0.151	20.9	2.90	11.23	277	clear	—
1345	5		3.38		5.91	0.151	19.2	1.60	11.16	271	"	"
1350			3.38		5.85	0.152	13.2	0.25	10.93	248	"	"
1355			3.40		5.83	0.154	9.11	0.0	10.90	233	"	"
1400			3.40		5.83	0.154	6.49	0.0	10.88	229	"	"
1405			3.39		5.83	0.153	6.35	0.0	10.78	229	"	"
~~1410~~			~~3.39~~		~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~"~~
1425			3.39		5.92	0.145	8.15	0.0	10.84	193	"	"
1430			3.39		5.85	0.144	8.15	0.0	10.66	178	"	"
1435			3.39		5.82	0.143	8.01	0.0	10.68	172	"	"
1440					5.81	0.143	7.97	0.0	10.65	173	"	"

New YSI needed

Constituents Sampled	Container	Number	Preservative
VOCs	VOAs 40mL	3	HCL
Perchlorate	500mL ~~[illegible]~~	1	—

Well Information

Well Location: ___ Well Locked at Arrival: Yes / No

Condition of Well: Good Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: ___

NOTES: Had to ~~[illegible]~~ switch out Horiba @1410. Sensors malfunctioned & wouldn't read.

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.5" = 0.09 2.5" = 0.26 3.5" = 0.50 6" = 1.47 1.25" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65

ATK_Field_forms.xls
Low_flow_GW Samp Form

Sampled @ 1445

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0606 | Well ID MW-20 | Date 3/20/19

Project Name/Location ATK | Weather sunny ~50°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4 | Well Material ✓PVC ___SS ___Other

Total Depth (ft-bmp) 13.14 | Static Water Level (ft-bmp) 5.23 | Water Column in Well 7.91 | Gallons in Well 5.14

Calc. Gallons Purged – | Pump Intake (ft-bmp) | Purge Method: Centrifugal ___ Submersible Bladder Pump ___ Disp. Bailer ___ Other ___ | Sample Method Low flow

Gallons Purged ~2.0 | MP Elevation --

Sample Time: Label 1330 | Replicate/ Code No. – | Pump On/Off 1252/1340

Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1254	0	300	5.55	–	6.30	0.244	5.46	8.92	10.60	169	none	none
1259	5	300	5.55	–	6.30	0.241	3.29	8.33	9.98	121	"	"
1304	10	250	5.53	–	6.30	0.243	4.34	7.88	9.89	105	"	"
1309	15	250	5.53	–	6.28	0.246	4.42	7.63	9.81	99	"	"
1314	20	250	5.53	–	6.27	0.247	5.06	7.40	9.84	96	"	"
1319	25	250	5.53	–	6.25	0.249	3.42	7.17	9.82	94	"	"
1324	30	250	5.53	–	6.25	0.250	3.49	6.99	9.82	91	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
See COC			

Well Information

Well Location: verified by map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: Sampled ID = MW-20(032019)@1330

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Page 1 of

Project No. MD001006.0006 | Well ID MW-22 | Date 3/20/19

Project Name/Location ATK | Weather sunny ~ 50°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4 | Well Material ☒ PVC ☐ SS ☐ Other

Total Depth (ft-bmp) 17.10 | Static Water Level (ft-bmp) 7.02 | Water Column in Well 10.08 | Gallons in Well 6.55

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal | Sample Method Lowflow

Gallons Purged ~2.0 | MP Elevation -- | Submersible Bladder Pump

Sample Time: Label 1215 | Replicate/ Code No. — | Disp. Bailer | Pump On/Off 1132/1225

Other | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1136	0	275	7.25	-	5.99	0.217	58.4	2.64	9.99	231	none	none
1141	5	250	7.26	-	6.01	0.215	24.0	0.52	9.64	212	"	"
1146	10	250	7.27	-	6.02	0.216	18.4	0.19	9.56	209	"	"
1151	15	250	7.27	-	6.02	0.216	15.0	0.17	9.49	207	"	"
1156	20	250	7.27	-	6.02	0.216	14.8	0.05	9.50	206	"	"
1201	25	250	7.27	-	6.02	0.216	12.2	0.00	9.51	205	"	"
1206	30	250	~~7.27~~	-	6.03	0.217	11.7	0.00	9.48	204	"	"
1211	35	250	7.27	-	6.02	0.217	11.2	0.00	9.51	204	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
See	COC		

Well Information

Well Location: verified by map | Well Locked at Arrival: ~~Yes~~ / No

Condition of Well: good | Well Locked at Departure: ~~Yes~~ / No

Well Completion: Flush Mount / ~~Stick Up~~ | Key Number To Well:

NOTES: sampled ID = MW-22 (032019) @ 1215

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | ~~4" = 0.65~~ | 6" = 1.47

ARCADIS

Groundwater Sampling Form

Page 1 of

Project No. MD001006.0006 | Well ID MW-23 | Date 3/22/19

Project Name/Location Elkton - ATK Orbital | Weather Windy 20°50°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4" | Well Material x PVC ___ SS ___ Other

Total Depth (ft-bmp) 17.10 | Static Water Level (ft-bmp) 7.35 | Water Column in Well 9.75 | Gallons in Well 6.34

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal ___ Submersible Bladder Pump | Sample Method Low flow

Gallons Purged 21.5 | MP Elevation -- | Disp. Bailer ___ Other ___ | Pump On/Off 0951 / 1040

Sample Time: Label 1030 | Replicate/ Code No. DUP-03(032219) | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0953	0	250	5.42	-	5.30	0.072	11.8	6.24	7.89	273	none	none
0958	5	250	5.42	-	5.40	0.065	10.99	6.05	8.08	271	"	"
1003	10	250	5.42	-	5.42	0.063	11.52	6.00	8.18	271	"	"
1008	15	250	5.42	-	5.42	0.064	13.50	5.56	8.27	273	"	"
1013	20	250	5.42	-	5.44	0.064	11.70	5.45	8.31	273	"	"
1018	25	250	5.42	-	5.45	0.064	12.50	5.37	8.41	273	"	"
1023	30	250	5.42	-	5.46	0.064	11.37	5.19	8.49	274	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none

Well Information

Well Location: verified by Map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well:

NOTES: Sample ID = MW-23 (032219) @ 1030

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | (4" = 0.65) | 6" = 1.47

ARCADIS

Groundwater Sampling Form

Page 1 of 1

Project No. MD0010060006 | Well ID MW-25 | Date 3-22-19

Project Name/Location ATK Orbital | Weather sunny/wind, 240°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4" | Well Material [X] PVC [ ] SS [ ] Other

Total Depth (ft-bmp) 15.04 | Static Water Level (ft-bmp) 5.03 | Water Column in Well 10.01 | Gallons in Well 6.51

Calc. Gallons Purged — | Pump Intake (ft-bmp) | Purge Method: Centrifugal | Sample Method Lowflow

Gallons Purged ~20.0 | MP Elevation -- | Submersible Bladder Pump

Sample Time: Label 1540 | Replicate/ Code No. — | Disp. Bailer | Other | Pump On/Off 1452/1548

Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1453	0	250	3.73	—	6.60	0.408	8.40	0.00	10.43	162	none	none
1458	5	250	3.75	—	6.69	0.397	7.63	0.00	10.07	164	"	"
1503	10	250	3.74	—	6.72	0.345	7.82	0.00	9.85	167	"	"
1508	15	250	3.74	—	6.72	0.327	7.79	0.00	9.82	170	"	"
1513	20	250	3.74	—	6.72	0.313	8.16	0.00	9.72	173	"	"
1518	25	250	3.74	—	6.73	0.309	7.50	0.00	9.81	174	"	"
1523	30	250	3.74	—	6.73	0.320	6.86	0.00	9.82	175	"	"
1528	35	250	3.74	—	6.72	0.324	6.42	0.00	9.73	172	"	"
1533	40	250	3.74	—	6.73	0.328	5.84	0.00	9.51	180	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
perchlorate	500mL Plastic	1	none
sulfate	125mL Plastic	1	none
TOC	40mL VOA Amber	3	H_2SO_4
dissolved Iron	250mL Plastic	1	HNO_3

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well:

NOTES: Sample ID = MW-25 (032219) @ 1540

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID MW-28 Date 3/22/14

Project Name/Location ATK orbital Weather CC & windy

Measuring Pt. Description TOC Screen Setting (ft-bmp) 23.26-33.26 Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 16.94 Static Water Level (ft-bmp) 5.56 Water Column in Well ____ Gallons in Well ____

Calc. Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Submersible ____

Sample Time: Label 1025 Replicate/ Code No. ____ Disp. Bailer ____ Other ____ Pump On/Off 0834

Sampled by CM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0844		75mL	5.56		6.31	0.436	44.8	0.45	58.79	70	clear	=
0944	5		5.60		6.50	0.425	41.9	0.00	8.46	30	"	"
0954			5.60		6.54	0.421	37.1	0.0	9.04	15	"	"
0959			5.60		6.55	0.419	39.8	0.0	9.07	10	"	"
1004			5.63		6.53	0.416	40.5	0.0	9.35	2	"	"
1009			5.64		6.57	0.416	40.1	0.0	9.55	-2	"	"
1014			5.62		6.56	0.416	39.2	0.0	9.57	-5	"	"
1019			5.58		6.60	0.416	39.1	0.0	9.62	-6	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	VOAs 40mL	3	HCl
perchlorate	500mL plastic	1	
Dissolved iron	250mL plastic	1	Nitric Acid
TOC	VOAs 40mL	3	Sulfuric acid
sulfate	125mL plastic	1	

Well Information

Well Location: ____ Well Locked at Arrival: Yes / No

Condition of Well: Good, rusty Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: ____

NOTES: Sampled @ 1025

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_flow_GW Samp Form

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID MW-29 Date 3/22/19

Project Name/Location ATK orbital Weather cold, windy

Measuring Pt. Description TOC Screen Setting (ft-bmp) 24.30-34.30 Casing Diameter (in.) 4 Well Material ___PVC ___SS ___Other

Total Depth (ft-bmp) 16.47 Static Water Level (ft-bmp) 6.42 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal ____ Submersible ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer ____ Other ____ Pump On/Off 1050

Sample Time: Label 1140 Replicate/ Code No. ____ Sampled by CM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1050		100/mn	6.42		6.40	0.221	3.01	0.54	10.82	39	clear	—
1055	5		[illegible]		6.18	0.225	1.21	0.0	10.[illegible]	100	"	"
1100			6.43		6.17	0.224	1.26	0.0	10.78	131	"	"
1105			6.42		6.17	0.224	1.70	0.0	10.82	150	"	"
1110			6.42		6.16	0.221	1.37	0.0	10.78	160	"	"
1115			6.43		6.16	0.221	1.67	0.0	10.72	168	"	"
1120			6.43		6.17	0.221	1.76	0.0	10.71	172	"	"
1125			6.43		6.16	0.219	1.81	0.0	10.75	178	"	"
1130			6.43		6.16	0.219	1.88	0.0	10.73	179	"	"

Constituents Sampled	Container	Number	Preservative
VOC's	40ml VOA's	3	HCL
perchlorate	500ml plastic	1	—

Well Information

Well Location: ____ Well Locked at Arrival: Yes / No

Condition of Well: Good, rusty Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well: ____

NOTES: Sampled @ 1140

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.25	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_field_forms.xls
Low_flow_GW Samp Form

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID GM-1B Date 3/19/19

Project Name/Location ATK Orbital Weather warm, sunny

Measuring Pt. Description ____ Screen Setting (ft-bmp) 7.91-17.91 Casing Diameter (in.) 4 Well Material: ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 51.84 Static Water Level (ft-bmp) 14.80 Water Column in Well ____ Gallons in Well ____

Calc. Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal Submersible ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer ____ Pump On/Off 1441

Sample Time: Label 1530 Replicate/ Code No.: ____ Other ____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1441		200/mn	14.88		11.70	0.185	3.54	2.27	12.13	45	clear	—
1446	5	↓	14.89		11.69	0.153	0.87	1.54	12.08	42	"	"
1451			14.89		11.35	0.127	9.13	1.06	11.99	51	"	"
1456			14.89		11.26	0.122	3.87	0.70	11.96	55	"	"
1501			14.89		11.00	0.118	3.26	0.60	11.93	65	"	"
1506			14.89		10.89	0.117	3.70	0.42	11.99	68	"	"
1511			14.89		10.89	0.117	2.49	0.47	12.11	67	"	"
1516			14.89		10.69	0.119	3.12	0.36	11.98	74	"	"
1521			14.89		10.61	0.117	2.96	0.47	11.93	82	"	"
1526		↓	14.89		10.60	0.116	2.96	0.39	11.90	84	"	"

1446 Turb. = 4.14

Constituents Sampled	Container	Number	Preservative
VOCs	VOAs - HCL	3	HCL
perchlorate	500mL plastic	1	
TOC	VOAs - sulfuric	3	Sulfuric Acid
1,4 Dioxane	Glass Amber	2	
Dissolved iron	Nitric Acid plastic	1	Nitric Acid
Sulfate	125 plastic	1	

Well Information

Well Location: ____ Well Locked at Arrival: (Yes) / No

Condition of Well: Good Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ____

NOTES: Sampled @ 1530

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

ATK_Field_Forms.xls
Low_Flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID GM-2B | Date 3-26-19

Project Name/Location ATK Orbital | Weather sunny ~30°F

Measuring Pt. Description TOP | Screen Setting (ft-bmp) | Casing Diameter (in.) 6" | Well Material X PVC, X SS, ___ Other

Total Depth (ft-bmp) 44.62 | Static Water Level (ft-bmp) 27.73 | Water Column in Well 16.89 | Gallons in Well 24.82

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal, Submersible Bladder Pump, Disp. Bailer, Other | Sample Method lowflow

Gallons Purged ~2.0 | MP Elevation -- | Pump On/Off 1339/

Sample Time: Label 1435 | Replicate/ Code No. – | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1341	0	250	27.79	-	7.03	0.240	76.8	0.73	14.22	126	none	none
1346	5	250	27.83	-	7.36	0.248	16.0	0.00	13.87	-164	"	"
1351	10	250	28.00	-	7.49	0.250	12.58	0.00	13.84	-190	"	"
1356	15	250	28.17	-	7.56	0.250	13.68	0.00	13.81	-203	"	"
1401	20	250	28.38	-	7.59	0.250	12.0	0.00	13.78	-208	"	"
1406	25	250	28.39	-	7.61	0.250	9.79	0.00	13.88	-212	"	"
1411	30	250	28.42	-	7.62	0.250	11.89	0.00	13.83	-215	"	"
1416	35	250	28.45	-	7.63	0.251	9.36	0.00	13.86	-217	"	"
1421	40	250	28.45	-	7.63	0.251	9.20	0.00	13.75	-218	"	"
1426	45	250	28.47	-	7.63	0.251	8.17	0.00	13.79	-218	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none
sulfate	125mL Plastic	1	none
TOC	40mL VOA Amber	3	H_2SO_4
dissolved Iron	250mL Plastic	1	HNO_3

Well Information

Well Location: ~~located by map~~ | Well Locked at Arrival: Yes / (No)

Condition of Well: poor | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: sample ID = GM-2B (032619) @ 1435

location not to map, depth not to previous = only well in area

Well Casing Volumes

Gallons/Foot				
1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	(6" = 1.47)
1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Project No. _____ Well ID GM-4B Date 3/19/19

Project Name/Location ATK Weather sunny ~60°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) _____ | Casing Diameter (in.) 4 | Well Material X PVC ___ SS ___ Other

Total Depth (ft-bmp) 50.79 | Static Water Level (ft-bmp) 6.15 | Water Column in Well 44.64 | Gallons in Well 29.02

Calc. Gallons Purged — | Pump Intake (ft-bmp) _____ | Purge Method: Centrifugal _____ Submersible Bladder Pump | Sample Method Low flow

Gallons Purged ~1.5 | MP Elevation -- | Disp. Bailer _____ Other _____ | Pump On/Off 1312/1400

Sample Time: Label 1350 | Replicate/ Code No. — | Sampled by AF

					.1	3%	10%	10%	3%	±10		
Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1315	0	250	6.23	-	6.20	0.292	9.60	4.79	12.84	115	none	none
1320	5	250	6.25	-	6.10	0.283	9.86	2.84	12.53	150	"	"
1325	10	250	6.23	-	6.09	0.289	12.70	2.77	12.26	168	"	"
1330	15	250	6.23	-	6.10	0.293	12.90	4.96	12.14	180	"	"
1335	20	250	6.23	-	6.07	0.294	9.86	5.27	12.03	192	"	"
1340	25	250	6.23	-	6.04	0.291	8.03	5.01	11.93	199	"	"
1345	30	250	6.23	-	5.99	0.292	6.67	4.93	11.90	209	"	"
				Sampled								

Constituents Sampled	Container	Number	Preservative
See	COC		

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well:

NOTES: Sample ID = GM-4B (031919) @ 1350

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID GM-9M Date 3/20/19

Project Name/Location ATK Orbital Weather sunny cold.

Measuring Pt. Description ____ Screen Setting (ft-bmp) 10.71-20.71 Casing Diameter (in.) ____ Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 60.03 Static Water Level (ft-bmp) 17.26 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal Submersible ____ Sample Method low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer Other ____ Pump On/Off 0854

Sample Time: Label 0940 Replicate/ Code No. ____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0858		100 mL/min	17.73		4.95	0.076	9.31	0	10.89	276	clear	none
0903	5		17.74		4.83	0.073	8.75	0	11.50	275	"	"
0908			17.93		4.80	0.071	15.5	0	11.77	275	"	"
0913			17.96		5.12	0.07	24.1	0	12.09	263	"	"
0918			17.95		5.18	0.071	57.1	0	12.11	260	"	"
0923			17.87		5.23	0.072	49.7	0	12.01	259	"	"
0928			17.76		5.18	0.07	51.3	0	11.67	261	"	"
0933			17.76		5.19	0.071	53.3	0	11.55	263	"	"
0938					5.19	0.071	55.2	0	11.79	261	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOAs	3	HCL
perchlorate	500 Plastic	1	
1,4 Dioxane	250 Amber	1	

Well Information

Well Location: ____ Well Locked at Arrival: (Yes) / No

Condition of Well: good Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ____

NOTES: Sampled @ 0940

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_Flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0006 | Well ID GM-105 | Date 3-20-19

Project Name/Location ATK | Weather sunny ~40°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4 | Well Material x PVC ___ SS ___ Other

Total Depth (ft-bmp) 19.69 | Static Water Level (ft-bmp) 9.94 | Water Column in Well 9.75 | Gallons in Well 6.34

Calc. Gallons Purged - | Pump Intake (ft-bmp) | Purge Method: Centrifugal ___ Submersible Bladder Pump | Sample Method Low flow

Gallons Purged ~1.5 | MP Elevation -- | Disp. Bailer ___ Other ___ | Pump On/Off 0906/0957

Sample Time: Label 0945 | Replicate/ Code No. ~ | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0908	0	250	10.02	-	5.24	0.119	27.4	3.40	8.79	287	none	none
0913	5	250	10.00	-	5.30	0.116	15.0	2.00	9.32	295	"	"
0918	10	250	10.01	-	5.30	0.116	13.0	1.60	9.53	301	"	"
0923	15	250	10.00	-	5.30	0.116	7.30	1.45	9.64	306	"	"
0928	20	250	10.00	-	5.30	0.115	8.37	1.42	9.69	309	"	"
0933	25	250	10.00	-	5.30	0.114	9.65	1.37	9.85	310	"	"
0938	30	250	10.00	-	5.30	0.115	8.51	1.34	9.98	313	"	"
			sampled									

Constituents Sampled	Container	Number	Preservative
See	COC		

Well Information

Well Location:	verified by map	Well Locked at Arrival:	Yes / No
Condition of Well:	good	Well Locked at Departure:	Yes / No
Well Completion:	Flush Mount / Stick Up	Key Number To Well:	

NOTES: Sample ID = GM-105 (032019) @ 0945

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. MD001006.0005 Well ID GM-14M Date 3/19/19

Project Name/Location ATK Orbital Weather sunny, cold

Measuring Pt. Description TOC Screen Setting (ft-bmp) 35.04-65.04 Casing Diameter (in.) ____ Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 107.29 Static Water Level (ft-bmp) 28.11 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal ____ Submersible ____ Disp. Bailer ____ Other ____ Sample Method Low Flow

Gallons Purged ____ MP Elevation ____ Pump On/Off 0952/1055

Sample Time: Label 1055 Replicate/ Code No. ____ Sampled by KM

					0.1	3%	10%	10%	3%	10		
Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0945	KM											
0952		75 mL/min	28.15		6.18	0.085	2.10	0.19	11.45	33	clear	—
0956	5 min		28.17		6.28	0.168	31.3	0.00	11.59	24	clear	—
1001			28.20		6.37	0.166	15.0	0.0	11.68	13	clear	—
1006			28.24		6.65	0.166	13.2	0.0	11.81	-6	clear	—
1011		KM									clear	—
1023			28.26		6.70	0.166	13.6	0.0	12.76	-6	clear	—
1028			28.37		6.33	0.148	7.35	0.0	12.92	55	clear	—
1033			28.44		6.35	0.148	8.50	0.0	13.92	181	clear	—
1038			28.52		6.35	0.144	9.97	0.0	13.33	184	clear	—
1043			28.52		6.35	0.143	7.05	0.0	13.43	186	clear	—
1048			28.51		6.35	0.142	6.77	0.0	13.60	187	clear	—
1053			28.52		6.36	0.142	6.82	0.0	13.70	187	clear	—

Constituents Sampled	Container	Number	Preservative
1,4 Dioxane (2 Ambers)			
VOCs (VOAs)			
Perchlorate (500mL)			
Sulfate (125mL)			
Dissolved iron (250)			
TOC (VOAs, sulfuric)			

Well Information

Well Location: ____ Well Locked at Arrival: (Yes) / No

Condition of Well: ____ Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ____

NOTES:

Sampled @ 1055 purged ~2.5 gals

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_Flow_GW Samp Form

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Groundwater Sampling Form

Project No. _____ Well ID GM-145 Date 3-19-19

Project Name/Location ATK Weather Sunny

Measuring Pt. Description TOP Top of pipe Screen Setting (ft-bmp) _____ Casing Diameter (in.) 4" Well Material X PVC ___ SS ___ Other

Total Depth (ft-bmp) 68.61 Static Water Level (ft-bmp) 30.47 Water Column in Well 38.14 Gallons in Well 24.8

Calc. Gallons Purged ~ Pump Intake (ft-bmp) ~ Purge Method: Centrifugal ___ Submersible Bladder Pump Sample Method Low flow

Gallons Purged ~1.5 MP Elevation -- Disp. Bailer ___ Other ___ Pump On/Off 0955/1059

Sample Time: Label 1055 Replicate/ Code No. ~ Sampled by AF/KM

							.1	3%	10%	10%	3%	±10		
Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1000	5	500	30.76	~	5.50	0.318	18.0	4.19	12.73	43	none	none
1005	10	300	30.70	~	5.51	0.319	15.3	3.45	12.59	42	"	"
1010	15	300	30.57	~	5.52	0.313	14.7	2.84	12.42	41	"	"
1015	20	300	30.59	~	5.52	0.309	9.91	2.64	12.76	40	"	"
1020	25	300	30.60	~	5.52	0.308	11.5	2.23	12.38	40	"	"
1025	30	300	30.60	~	5.53	0.308	9.75	2.03	12.42	41	"	"
1030	35	300	30.60	~	5.52	0.307	8.57	1.72	12.50	40	"	"
1035	40	300	30.60	~	5.52	0.306	6.11	1.52	12.58	40	"	"
1040	45	300	30.60	~	5.54	0.307	6.63	1.32	12.66	39	"	"
1045	50	300	30.60	~	5.55	0.305	7.63	1.31	12.76	39	"	"
1050	55	300	30.60	~	5.53	0.304	6.14	1.26	12.90	38	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
See CoC			

Well Information

Well Location: verified by map — Well Locked at Arrival: Yes / No

Condition of Well: good — Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up — Key Number To Well: _____

NOTES: Sample ID = GM-145 (031919) @ ~~1050~~ 1055

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

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Low Flow Groundwater Sampling Form

Page 1 of ___

Project No. ___ Well ID GM-15M Date 3/19/19

Project Name/Location ATK Orbital Weather warm Sunny

Measuring Pt. Description TOC Screen Setting (ft-bmp) 6.17-16.17 Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 46.85 Static Water Level (ft-bmp) 11.61 Water Column in Well ___ Gallons in Well ___

Calc. Gallons Purged ___ Pump Intake (ft-bmp) ___ Purge Method: Centrifugal ___ Submersible ___ Sample Method Low flow

Gallons Purged ___ MP Elevation ___ Disp. Bailer ___ Pump On/Off 1313/

Sample Time: Label 1355 Replicate/ Code No. ___ Other ___ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1315		200/mn	11.63		6.19	0.133	5.65	0	12.68	224	clear	—
1320	5		11.63		5.93	0.130	12.0	0	12.43	242	"	"
1325			11.63		5.77	0.129	10.70	0	12.33	253	"	"
1330			11.63		5.65	0.128	7.99	0	12.32	260	"	"
1335			11.63		5.67	0.127	5.11	0	12.21	263	"	"
1340			11.63		5.70	0.127	6.09	0	12.16	264	"	"
1345			11.63		5.71	0.127	5.92	0	12.20	264	"	"
1350			11.63		5.72	0.127	5.87	0	12.22	264		

Constituents Sampled	Container	Number	Preservative
VOCs	VOAs	3(3)	Hydrochloric acid
perchlorate	500mL Plastic	1(1)	none

Well Information

Well Location: woods. Well Locked at Arrival: (Yes) / No

Condition of Well: rusty Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ___

NOTES: *DUP-01* DUP01(03/19/19) sampled @ 1355

Well Casing Volumes

Gallons/Foot	1" = 0.04	1.5" = 0.09	2.5" = 0.25	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_Forms.xls
Low_Flow_GW Samp Form

purged ≈ 2.75 gal

ARCADIS

Groundwater Sampling Form

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Project No. MD001006.0006 | Well ID GM-16M | Date 3/26/19

Project Name/Location ATK Orbital | Weather sunny ~30°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) ____ | Casing Diameter (in.) 4" | Well Material ☒ PVC ☐ SS ☐ Other

Total Depth (ft-bmp) 99.05 | Static Water Level (ft-bmp) 0.0 | Water Column in Well 99.05 | Gallons in Well 64.40

Calc. Gallons Purged ____ | Pump Intake (ft-bmp) ____ | Purge Method: Centrifugal ____ Submersible Bladder Pump ____ | Sample Method Low flow

Gallons Purged ____ | MP Elevation -- | Disp. Bailer ____ Other ____ | Pump On/Off 0830 /

Sample Time: Label 0910 | Replicate/ Code No. ____ | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0833	0	200	0.0	-	5.61	0.122	113	0.00	7.66	76	orange	none
0838	5	200	0.0	-	5.82	0.116	73.4	0.00	8.56	48	"	"
0843	10	200	0.0	-	5.91	0.112	70.0	0.00	8.76	39	none	"
0848	15	200	0.0	-	5.96	0.111	22.1	0.00	8.87	36	"	"
0853	20	200	0.0	-	6.02	0.110	35.3	0.00	9.03	32	"	"
0858	25	200	0.0	-	6.10	0.110	28.6	0.00	9.07	28	"	"
0903	30	200	0.0	-	6.15	0.110	28.3	0.00	9.18	24	"	"
0908	35	200	0.0	-	6.20	0.109	26.9	0.00	9.24	22	"	"
					sump dry							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: verified by map | Well Locked at Arrival: Yes / No

Condition of Well: poor | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / ~~Stick Up~~ | Key Number To Well: ____

NOTES: sample ID = GM-16M (032619) @ 0910

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | ~~4" = 0.65~~ | 6" = 1.47

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of

Project No. MD001006.0006 | Well ID GM-16S | Date 3/26/14

Project Name/Location ATK Orbital | Weather

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4 | Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-btoc) 33.62 | Static Water Level (ft-bmp) 0.0 | Water Column in Well | Gallons in Well

Calc.Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal / Submersible Bladder pump / Disp. Bailer / Other | Sample Method Low flow

Gallons Purged | MP Elevation | Pump On/Off 0816

Sample Time: Label 0900 | Replicate/ Code No. | Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0831		200ml	0.0		4.50	0.128	52.6	3.25	10.2	243	Clr	—
0836	5		0.0		4.65	0.109	41.1	1.49	10.29	300	"	"
0841			0.0		4.65	0.107	31.0	0.84	10.63	304	"	"
0836			0.0		4.65	0.106	25.7	0.46	10.65	304	"	"
0851			0.0		4.65	0.105	20.7	0.14	10.55	313	"	"
0846			0.0		4.66	0.106	18.1	0.0	10.77	317	"	"
0851			0.0		4.67	0.104	18.2	0.0	11.15	319	"	"
0856			0.0		4.65	0.104	16.8	0.0	11.20	323	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOAs	3	HCl
Perchlorate	50mL Nalgene	1	—
1,4 Dioxane	250mL Amber	2	—

Well Information

Well Location:

Condition of Well: Flooded, well casing flooded

Well Completion: Flush Mount / Stick Up

Well Locked at Arrival: Yes / No

Well Locked at Departure: Yes / No

Key Number To Well:

NOTES: Sampled @ 0900

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_Forms.xls
Low_flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

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Project No. MD001006.0006 | Well ID GM-21M | Date 3-25-19

Project Name/Location ATK Orbital | Weather Sunny ~60°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) ____ | Casing Diameter (in.) 4" | Well Material X PVC ___ SS ___ Other

Total Depth (ft-bmp) 52.80 | Static Water Level (ft-bmp) 1.86 | Water Column in Well 50.94 | Gallons in Well 33.11

Calc. Gallons Purged ____ | Pump Intake (ft-bmp) ____ | Purge Method: Centrifugal ____ Submersible Bladder Pump | Sample Method Low flow

Gallons Purged ____ | MP Elevation -- | Disp. Bailer ____ Other ____ | Pump On/Off 1413

Sample Time: Label 1500 | Replicate/ Code No. DUP-04(032519) | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1418	0	250	1.55	-	4.71	0.038	53.5	4.90	11.66	278	none	none
1423	5	250	1.59	-	4.61	0.038	44.5	3.15	11.42	281	"	"
1428	10	250	1.53	-	4.59	0.038	33.2	3.14	10.96	281	"	"
1433	15	250	1.55	-	4.56	0.038	36.3	2.99	10.57	283	"	"
1438	20	250	1.55	-	4.54	0.036	30.7	2.76	10.43	285	"	"
1443	25	250	1.55	-	4.53	0.036	30.4	2.46	10.34	288	"	"
1448	30	250	1.55	-	4.53	0.036	31.7	2.28	10.26	287	"	"
1453	35	250	1.55	-	4.52	0.037	32.4	2.31	10.18	290	"	"
						Sampled						

Constituents Sampled	Container	Number	Preservative
VOC	40mL VOA	3	HCl
Perchlorate	500 mL Plastic	1	none
1,4-Dioxane	250 mL Amber	2	none
Sulfate	125mL Plastic	1	none
TOC	40mL VOA Amber	3	H_2SO_4
Dissolved Iron	250mL Plastic	1	HNO_3

Well Information

Well Location: Verified by map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: Sample ID = GM-21M (032519) @ 1500

Significant rain h/w gauging & sampling

Well Casing Volumes

Gallons/Foot				
1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0006 | Well ID GM-215 | Date 3-25-19

Project Name/Location ATK Orbital | Weather Sunny ~60°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4" | Well Material ✓ PVC / SS / Other

Total Depth (ft-bmp) 27.35 | Static Water Level (ft-bmp) 3.97 | Water Column in Well 23.38 | Gallons in Well 15.20

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal / Submersible Bladder Pump | Sample Method Low flow

Gallons Purged | MP Elevation -- | Disp. Bailer / Other | Pump On/Off 12:44/1350

Sample Time: Label 1340 | Replicate/ Code No. — | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1245	0	100	4.02	-	502	0079	130	1.59	13.32	268	none	none
1250	5	100	3.97	-	4.30	0.079	52.3	0.52	13.01	331	"	"
1255	10	250	4.02	-	3.95	0.078	37.5	0.00	12.20	370	"	"
1300	15	250	4.04	-	3.90	0.077	32.0	0.00	11.31	383	"	"
1305	20	250	4.06	-	3.90	0.077	21.4	0.00	10.95	391	"	"
1310	25	250	4.08	-	3.93	0.077	19.0	0.00	10.93	392	"	"
1315	30	250	4.09	-	4.00	0.076	17.6	0.00	10.92	392	"	"
1320	35	250	4.10	-	4.10	0.076	17.2	0.00	10.99	390	"	"
1325	40	250	4.10	-	4.10	0.076	15.4	0.00	10.78	390	"	"
1330	45	250	4.11	-	4.12	0.076	14.8	0.00	10.69	390	"	"
1335	50	250	4.11	-	4.15	0.076	14.8	0.00	10.67	391	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: verified by map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: SampleID = GM-215 (032519) @ 1340

Well Casing Volumes

Gallons/Foot				
1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0006 | Well ID GM-22M | Date 3/25/19

Project Name/Location ATK Elkton | Weather ____

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): ____ | Casing Diameter (in.): 4" | Well Material: ☒ PVC ☐ SS ☐ Other

Total Depth (ft-bmp): 38.75 | Static Water Level (ft-bmp): 5.88 | Water Column in Well: 32.87 | Gallons in Well: 21.37

Calc. Gallons Purged: ____ | Pump Intake (ft-bmp): ____ | Purge Method: Centrifugal ____ Submersible Bladder Pump | Sample Method: Low flow

Gallons Purged: ____ | MP Elevation: -- | Disp. Bailer ____ Other ____ | Pump On/Off: 1149

Sample Time: Label 1245 | Replicate/ Code No. ____ | Sampled by: KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1153		250/min	5.49		4.99	0.263	64.6	0.34	14.47	283	clear	—
1158	5		5.67		4.96	0.255	67.2	0.00	14.40	287	"	"
1203			5.63		4.98	0.247	40.2	0.0	14.45	289	"	"
1208			5.63		4.98	0.241	35.6	0.0	14.32	292	"	"
1213			5.64		4.96	0.235	32.3	0.0	14.32	294	"	"
1218			5.62		4.96	0.230	26.6	0.0	14.15	296	"	"
1223			5.62		4.96	0.228	21.6	0.0	14.14	298	"	"
1228			5.62		4.96	0.228	13.0	0.0	14.07	300	"	"
1233			5.62		4.96	0.229	12.5	0.0	14.04	301	"	"
1238			5.63		4.96	0.229	11.9	0.0	14.02	303	"	"
											"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none
Sulfate	125mL Plastic	1	none
TOC	40mL Amber VOA	3	H_2SO_4
Dissolved Iron	250mL Plastic	1	HNO_3

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well: ____

NOTES: sample ID = GM-22M (03/25/19) @ 1245

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	(4" = 0.65)	

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0006 | Well ID GM-225 | Date 3/25/19

Project Name/Location ATK Elkton | Weather Cloudy, temperate.

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): ____ | Casing Diameter (in.): 4" | Well Material: (X) PVC ( ) SS ( ) Other

Total Depth (ft-bmp): 22.71 | Static Water Level (ft-bmp): 7.57 | Water Column in Well: 15.14 | Gallons in Well: 9.84

Calc. Gallons Purged: ____ | Pump Intake (ft-bmp): ____ | Purge Method: Centrifugal ____ / Submersible Bladder Pump | Sample Method: Low flow

Gallons Purged: ____ | MP Elevation: -- | Disp. Bailer ____ / Other ____ | Pump On/Off: 1302

Sample Time: Label 1355 | Replicate/ Code No. ____ | Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1315		250 mL/min	7.33		4.79	0.443	5.66	1.03	14.07	298	clear	—
1320	5		7.32		4.78	0.439	5.59	0.37	14.38	304	"	"
1325			7.33		4.76	0.451	7.04	0.20	13.55	313	"	"
1330			7.31		4.75	0.448	7.72	0.00	13.92	317	"	"
1335			7.31		4.76	0.449	8.56	0.0	14.04	321	"	"
1340			7.31		4.77	0.449	7.64	0.0	13.90	325	"	"
1345			7.32		4.76	0.447	7.97	0.0	13.90	327	"	"
1350			7.31		4.77	0.446	7.54	0.0	13.87	330	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well: ____

NOTES: Sample ID = GM-225 (03/25/19) @ 1355

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | (4" = 0.65) | 6" = 1.47

ARCADIS

Groundwater Sampling Form

Project No. _____ Well ID GM-24 Date 3/19/19

Project Name/Location ATK Weather sunny ~55°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) _____ | Casing Diameter (in.) 4" | Well Material X PVC ___ SS ___ Other

Total Depth (ft-bmp) 90.99 | Static Water Level (ft-bmp) 33.08 | Water Column in Well 57.91 | Gallons in Well 37.64

Calc. Gallons Purged _____ | Pump Intake (ft-bmp) _____ | Purge Method: Centrifugal _____ Submersible Bladder Pump | Sample Method Low Flow

Gallons Purged ~2.0 | MP Elevation -- | Disp. Bailer _____ Other _____ | Pump On/Off 1522/1637

Sample Time: Label 1620 | Replicate/ Code No. — | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1527	0	100	33.20	-	5.72	0.063	24.0	3.53	13.65	186	none	none
1532	5	200	33.26	-	5.28	0.062	30.9	2.13	13.27	224	"	"
1537	10	250	33.38	-	5.15	0.063	44.8	1.51	13.28	255	"	"
1542	15	250	33.45	-	5.10	0.064	55.4	1.18	13.27	268	"	"
1547	20	250	33.55	-	5.10	0.066	46.9	1.07	13.26	273	"	"
1552	25	250	33.55	-	5.05	0.065	37.9	0.99	13.28	281	"	"
1557	30	250	33.60	-	5.03	0.065	38.8	0.99	13.29	286	"	"
1602	35	250	33.60	-	5.01	0.066	29.5	1.01	13.23	291	"	"
1607	40	250	33.60	-	4.98	0.067	23.7	1.06	13.21	295	"	"
1612	45	250	33.60	-	4.97	0.068	23.8	1.07	13.22	299	"	"
1617	50	250	33.60	-	4.96	0.069	24.4	1.14	13.19	305	"	"
					Sampled							

Constituents Sampled	Container	Number	Preservative
See	COC		

Well Information

Well Location:	Verified by map	Well Locked at Arrival:	Yes / No
Condition of Well:	good	Well Locked at Departure:	Yes / No
Well Completion:	Flush Mount / Stick Up	Key Number To Well:	

NOTES: Sample ID = GM-24 (031919) @ 1620

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of

Project No. _____ Well ID GM-26M Date 3/28/19

Project Name/Location ATK Orbital Weather Sunny, Chilly

Measuring Pt. Description TOC Screen Setting (ft-bmp) _____ Casing Diameter (in.) 4 Well Material: ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 92.27 Static Water Level (ft-bmp) 32.98 Water Column in Well _____ Gallons in Well _____

Calc.Gallons Purged _____ Pump Intake (ft-bmp) _____ Purge Method: Centrifugal _____ Submersible _____ Sample Method Lowflow

Gallons Purged _____ MP Elevation _____ Disp. Bailer _____ Other _____ Pump On/Off 1155

Sample Time: Label 1240 Replicate/ Code No. _____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (C°) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1202		100 mL/min	32.85		5.59	0.057	24.6	7.37	11.34	227	clear	—
1207	5		32.92		4.92	0.053	38.1	4.78	11.58	299	"	"
1212			32.92		4.83	0.053	32.6	4.68	11.52	310	"	"
1217			32.92		4.83	0.053	26.3	4.10	11.95	317	"	"
1222			32.92		4.81	0.060	25.2	4.04	11.87	323	"	"
1227			32.92		4.79	0.058	24.0	4.03	11.96	329	"	"
1232			32.92		4.79	0.053	22.7	4.13	11.93	334	"	"
1237					4.81	0.051	19.9	4.08	11.88	337	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOAs	3	HCL
perchlorate	500mL plastic	1	—
1,4 Dioxane	250mL Amber	2	—
TOC	40mL VOAs	3	Sulfuric Acid
Sulfate	125mL plastic	1	—
Dissolved Iron	250mL plastic	1	Nitric Acid

Well Information

Well Location: _____ Well Locked at Arrival: (Yes) / No

Condition of Well: Good Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: _____

NOTES: Sampled @ 1240

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.25 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

ATK_Field_forms.xls
Low_Flow_GW Samp Form

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of ____

Project No. ____ Well ID GM-26S Date 3/26/19

Project Name/Location ATK Orbital Weather Cold, Sunny

Measuring Pt. Description TOC Screen Setting (ft-bmp) ____ Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 22.74 Static Water Level (ft-bmp) 7.57 Water Column in Well ____ Gallons in Well ____

Calc.Gallons Purged ____ Pump Intake (ft-bmp) ____ Purge Method: Centrifugal Submersible ____ Sample Method Low flow

Gallons Purged ____ MP Elevation ____ Disp. Bailer Other ____ Pump On/Off 1309

Sample Time: Label 1350 Replicate/ Code No. ____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (C) (F)	Redox (mV)	Appearance Color	Appearance Odor
1310		100/m	7.57		4.76	0.064	5.2	2.21	11.14	338	clear	—
1315	5	↓	7.53		4.80	0.064	10.6	1.05	11.33	342	"	"
1320			7.54		4.77	0.065	6.08	0.56	10.78	347	"	"
1325			7.55		4.76	0.065	6.14	0.21	10.58	350	"	"
1330			7.55		4.75	0.065	6.22	0.0	10.62	353	"	"
1335			7.56		4.76	0.065	5.47	0.0	10.69	355	"	"
1340			7.56		4.74	0.065	5.04	0.0	10.74	358	"	"
1345		↓	7.56		4.74	0.065	4.91	0.0	10.80	359	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA's	3	HCL
perchlorate	500mL plastic	1	—
1,4 Dioxane	250mL Amber	2	—

Well Information

Well Location: ____ Well Locked at Arrival: (Yes) / No

Condition of Well: Good Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) Key Number To Well: ____

NOTES: Sampled @ 1350

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_Flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

Project No. MD001006.0006 | Well ID GM-27 | Date 3-21-19

Project Name/Location ATK - Elkton | Weather rainy ~50°F

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): | Casing Diameter (in.): 4" | Well Material: X PVC, SS, Other

Total Depth (ft-bmp): 17.79 | Static Water Level (ft-bmp): 8.02 | Water Column in Well: 9.77 | Gallons in Well: 6.35

Calc. Gallons Purged: | Pump Intake (ft-bmp): | Purge Method: Centrifugal, Submersible Bladder Pump, Disp. Bailer, Other | Sample Method: Low flow

Gallons Purged: ~12.0 | MP Elevation: -- | Pump On/Off: 1030/

Sample Time: Label: 1115 | Replicate/ Code No.: — | Sampled by: AF/MK

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1032	0	500	8.15	-	5.11	0.602	9.95	4.05	10.03	291	none	none
1037	5	250	8.17	-	5.08	0.592	12.2	3.55	10.06	307	"	"
1042	10	250	8.21	-	5.05	0.590	9.92	3.27	10.06	315	"	"
1047	15	250	8.12	-	5.10	0.589	13.5	3.13	10.03	318	"	"
1052	20	250	8.12	-	5.13	0.589	16.8	3.04	10.02	321	"	"
1057	25	250	8.12	-	5.16	0.588	14.3	2.95	10.00	323	"	"
1102	30	250	8.12	-	5.18	0.587	12.6	2.91	9.98	325	"	"
1107	35	250	8.12	-	5.20	0.587	13.1	2.87	9.98	327	"	"
1112	40	250	8.12	-	5.21	0.597	12.6	2.92	9.98	327	"	"
				Sampled								

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: (Flush Mount) / Stick Up | Key Number To Well:

NOTES: Sample ID = GM-27 (032119) @ 1115

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | 2" = 0.16 | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | (4" = 0.65) | 6" = 1.47

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of

Project No. 30000106.0006 Well ID GM-30M Date 3/26/19

Project Name/Location ATK orbital Weather Sunny, warm

Measuring Pt. Description TOC Screen Setting (ft-bmp) Casing Diameter (in.) 4 Well Material ✓ PVC ___ SS ___ Other

Total Depth (ft-bmp) 19.74 Static Water Level (ft-bmp) 9.86 Water Column in Well Gallons in Well

Calc. Gallons Purged Pump Intake (ft-bmp) Purge Method: Centrifugal Submersible Sample Method Low flow

Gallons Purged MP Elevation Disp. Bailer Other Pump On/Off 1030

Sample Time: Label 1110 Replicate/ Code No. Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1030	5	200/min	9.86		5.85	1.11	65.4	0.0	11.44	247	clear	-
1035			9.99		5.88	1.11	62.8	0.0	11.98	287	"	"
1040			9.96		5.89	1.11	57.0	0.0	12.25	280	"	"
1045			9.96		5.89	1.10	51.3	0.0	12.31	273	"	"
1050			9.96		5.89	1.10	53.0	0.0	12.22	264	"	"
1055			9.99		5.88	1.12	49.1	0.0	11.50	265	"	"
1100			9.98		5.89	1.12	45.9	0.0	11.58	268	"	"
1105			9.99		5.89	1.12	42.0	0.0	11.65	259	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40 mL VOA	3(3)	HCL
perchlorate	500 mL plastic	1(1)	—
1,4 Dioxane	250 mL Amber	2(2)	—

Well Information

Well Location: within driveway Well Locked at Arrival: Yes / No

Condition of Well: Good Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up Key Number To Well:

NOTES:

DUP05(0306A) parent sampled @ 1110

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_forms.xls
Low_Flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID GM-31M | Date 3-26-19

Project Name/Location ATK Orbital | Weather sunny ~30°F

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): | Casing Diameter (in.): 4" | Well Material: X PVC, SS, Other

Total Depth (ft-bmp): 90.02 | Static Water Level (ft-bmp): 21.08 | Water Column in Well: 68.94 | Gallons in Well: 44.81

Calc. Gallons Purged: | Pump Intake (ft-bmp): | Purge Method: Centrifugal, Submersible, Bladder Pump | Sample Method: Low flow

Gallons Purged: | MP Elevation: -- | Disp. Bailer, Other | Pump On/Off: 1134/1225

Sample Time: Label 1220 | Replicate/ Code No. - | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1139	0	250	20.93	-	7.24	0.057	48.9	4.92	13.46	109	none	none
1144	5	250	20.93	-	6.91	0.050	33.6	3.69	13.76	148	"	"
1149	10	250	20.93	-	6.68	0.055	32.1	3.47	13.84	170	"	"
1154	15	250	20.93	-	6.64	0.056	27.3	3.13	13.85	172	"	"
1159	20	250	20.93	-	6.54	0.061	28.7	2.74	13.86	177	"	"
1204	25	250	20.93	-	6.48	0.064	27.7	2.49	13.88	182	"	"
1209	30	250	20.93	-	6.47	0.066	26.5	2.36	13.89	182	"	"
1214	35	250	20.93	-	6.42	0.068	25.9	2.18	13.86	183	"	"
					Sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
1,4-Dioxane	250 mL Amber	2	none
Perchlorate	500mL Plastic	1	none

Well Information

Well Location: verified by map | Well Locked at Arrival: Yes / No

Condition of Well: good | Well Locked at Departure: Yes / No

Well Completion: Flush Mount / Stick Up | Key Number To Well:

NOTES: Sample ID = GM-31M (032619) @ 1220

significant rain event b/w gauging & sampling

Well Casing Volumes

Gallons/Foot				
1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID GM-31S | Date 3-26-19

Project Name/Location ATK Orbital | Weather Sunny ~30°F

Measuring Pt. Description TOC | Screen Setting (ft-bmp) | Casing Diameter (in.) 4" | Well Material ✓ PVC / SS / Other

Total Depth (ft-bmp) 13.93 | Static Water Level (ft-bmp) 3.05 | Water Column in Well 10.88 | Gallons in Well 7.07

Calc. Gallons Purged | Pump Intake (ft-bmp) | Purge Method: Centrifugal / Submersible Bladder Pump | Sample Method Lowflow

Gallons Purged ~1.5 | MP Elevation -- | Disp. Bailer / Other | Pump On/Off 1023/

Sample Time: Label 1105 | Replicate/ Code No. — | Sampled by AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1026	0	250	3.06	-	6.75	0.240	74.6	0.93	9.63	87	none	none
1031	5	250	3.07	-	6.79	0.242	58.1	0.08	9.92	99	"	"
1036	10	250	3.09	-	6.81	0.243	43.4	0.00	10.12	113	"	"
1041	15	250	3.07	-	6.83	0.244	38.7	0.00	10.05	120	"	"
1046	20	250	3.07	-	6.86	0.245	33.4	0.00	10.09	121	"	"
1051	25	250	3.07	-	6.93	0.248	32.7	0.00	10.21	118	"	"
1056	30	250	3.07	-	6.94	0.251	30.1	0.00	10.24	119	"	"
1101	35	250	3.07	-	6.93	0.253	32.1	0.00	10.29	119	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: Verified by map | Well Locked at Arrival: ~~Yes~~ / No

Condition of Well: good | Well Locked at Departure: ~~Yes~~ / No

Well Completion: ~~Flush Mount~~ / Stick Up | Key Number To Well:

NOTES: Sample ID = GM-31S (032619) @ 1105

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ARCADIS

Low Flow Groundwater Sampling Form

Page 1 of

Project No. _____ Well ID GM-32 Date 3/25/19

Project Name/Location ATK-Orbital Weather sunny, temperate

Measuring Pt. Description TOC Screen Setting (ft-bmp) 7.95-17.95 Casing Diameter (in.) 4 Well Material: V PVC ___ SS ___ Other

Total Depth (ft-bmp) 33.51 Static Water Level (ft-bmp) 5.04 Water Column in Well _____ Gallons in Well _____

Calc.Gallons Purged _____ Pump Intake (ft-bmp) _____ Purge Method: Centrifugal _____ Submersible _____ Disp. Bailer _____ Other _____ Sample Method Low flow

Gallons Purged _____ MP Elevation _____ Pump On/Off 0919

Sample Time: Label 1020 Replicate/ Code No. _____ Sampled by KM

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0926		250mL	5.04		5.13	0.057	13.7	4.93	11.38	287	clear	—
0931	5		5.76		5.25	0.039	14.9	4.70	11.00	280	"	"
0936			5.76		5.22	0.034	13.9	4.50	10.84	280	"	"
0941			5.78		5.27	0.032	13.6	4.49	10.77	279	"	"
0946			5.78		5.28	0.031	14.8	4.07	10.81	278	"	"
0951			5.78		5.26	0.030	17.2	4.35	10.85	279	"	"
0956			5.80		5.28	0.030	18.7	4.26	10.47	272	"	"
1001			5.80		5.30	0.030	19.0	4.15	11.08	272	"	"
1006			5.80		5.28	0.030	23.5	4.06	11.14	270	"	"
1011			5.79		5.27	0.030	21.1	4.04	11.22	270	"	"
1016			5.76		5.30	0.030	21.1	3.97	11.16	267	"	"

Constituents Sampled	Container	Number	Preservative
VOCs	40 mL VOAs	3	HCl
Perchlorate	500mL Plastic	1	
1,4 Dioxane	Amber 250mL	2	—

Well Information

Well Location: _____ Well Locked at Arrival: Yes / No

Condition of Well: Good Well Locked at Departure: Yes / No

Well Completion: Flush Mount Stick Up Key Number To Well: _____

NOTES: Sampled @ 1020

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	5" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

ATK_Field_Forms.xls
Low_Flow_GW Samp Form

ARCADIS

Groundwater Sampling Form

Page 1 of 1

Project No. MD001006.0006 | Well ID GM-32D | Date 3/25/19

Project Name/Location ATK Orbital | Weather sunny ~35F

Measuring Pt. Description: TOC | Screen Setting (ft-bmp): | Casing Diameter (in.): 2" | Well Material: X PVC, SS, Other

Total Depth (ft-bmp): 57.70 | Static Water Level (ft-bmp): 5.30 | Water Column in Well: 52.40 | Gallons in Well: 8.38

Calc. Gallons Purged: — | Pump Intake (ft-bmp): | Purge Method: Centrifugal, Submersible Bladder Pump, Disp. Bailer, Other | Sample Method: Lowflow

Gallons Purged: ~3.0 | MP Elevation: -- | Pump On/Off: 0922/1033

Sample Time: Label 1025 | Replicate/ Code No. — | Sampled by: AF

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft) TOC	Gallons Purged	pH	Cond. (µmhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
0930	0	500	6.20	-	5.50	0.173	1186	3.81	10.93	-9	White	none
0935	5	250	6.85	-	5.83	0.152	1592	1.60	11.23	-78	"	"
0940	10	250	7.27	-	5.88	0.149	1743	1.90	10.97	-82	"	"
0945	15	250	7.70	-	5.93	0.147	1247	1.41	11.10	-84	"	"
0950	20	250	7.97	-	5.95	0.147	886	0.70	11.27	-84	"	"
0955	25	250	8.10	-	5.97	0.146	725	1.18	11.40	-83	"	"
1000	30	250	8.30	-	6.00	0.145	634	0.92	11.53	-82	"	"
1005	35	250	8.38	-	6.01	0.144	646	0.29	11.67	-74	"	"
1010	40	250	8.40	-	6.02	0.142	151	0.05	11.63	-67	"	"
1015	45	250	8.46	-	6.04	0.142	176	0.00	11.75	-64	"	"
1020	50	250	8.46	-	6.07	0.142	157	0.02	11.84	-64	"	"
					sampled							

Constituents Sampled	Container	Number	Preservative
VOCs	40mL VOA	3	HCl
Perchlorate	500mL Plastic	1	none
1,4-Dioxane	250mL Amber	2	none

Well Information

Well Location: verified by map | Well Locked at Arrival: (Yes) / No

Condition of Well: good | Well Locked at Departure: (Yes) / No

Well Completion: Flush Mount / (Stick Up) | Key Number To Well:

NOTES: Sample ID = GM-32D (03 25 19) @ 1025

Well Casing Volumes

Gallons/Foot: 1" = 0.04 | 1.25" = 0.06 | 1.5" = 0.09 | (2" = 0.16) | 2.5" = 0.26 | 3" = 0.37 | 3.5" = 0.50 | 4" = 0.65 | 6" = 1.47

ARCADIS

Surface Water Sample Log

Sample ID SW-1C
Project/No. MD001006.0006
Date 3/27/19
Sampling Personnel K.Morrison/A. Field
Time 0820
Weather Sunny ~ 30°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water ± 8"
Velocity
Other Comments
Substrate Description gravel (large & small)
Location verified by map

Description of Nearby Vegetation grass

FIELD PARAMETERS:

Sample Method Peristaltic Pump
Sample Description

Temperature (°C/°F) 5.30
pH 6.07
Dissolved Oxygen 9.92
SC 0.191
Salinity
Turbidity 2.48

CONTAINER DESCRIPTION: From Lab ARCADIS

Bottle Type	Analysis	Preservative
40mL VOA	VOCs	HCl
500mL Plastic	perchlorate	none
1L Amber	SVOCs	none
250mL Plastic	metals	HNO_3

ARCADIS

Surface Water Sample Log

Sample ID SW-2B
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel K.Morrison/A. Field
Time 0910
Weather sunny ~ 30°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water 14"
Velocity
Other Comments
Substrate Description gravel & sand
Location verified by map

Description of Nearby Vegetation grasses, briars

FIELD PARAMETERS:

Sample Method peristaltic pump
Sample Description

Temperature (°C/°F) 5.32
pH 6.72
Dissolved Oxygen 8.81
SC 0.191
~~Salinity~~ Turbidity 2.21 NTU

CONTAINER DESCRIPTION: From Lab ARCADIS

Bottle Type	Analysis	Preservative
40mL VOA	VOCs	HCl
1L Amber	SVOCs	none
500mL Plastic	Perchlorate	none
250mL Plastic	metals	HNO_3

DUP-06 (032719) taken here

ARCADIS

Surface Water Sample Log

Sample ID SW-6C
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel AF/KM
Time 1115
Weather sunny ~40°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water 13"
Velocity
Other Comments
Substrate Description sand & gravel
Location verified by map

Description of Nearby Vegetation

FIELD PARAMETERS:

Sample Method peri pump
Sample Description

Temperature (~~C~~ F) 6.27
pH 7.12
Dissolved Oxygen 9.36
SC 0.196
~~Salinity~~ turbidity 3.87

CONTAINER DESCRIPTION: From Lab ARCADIS

Bottle Type	Analysis	Preservative
40mL VOA	VOC's	HCL
500mL Plastic	Perchlorate	—
250mL Amber	1,4 Dioxane	—

ARCADIS

Surface Water Sample Log

Sample ID SW-GD
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel AF/KM
Time 1130
Weather Sunny ~ 40°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water 4ft
Velocity
Other Comments
Substrate Description
Location verified by map

Description of Nearby Vegetation

FIELD PARAMETERS:

Sample Method peri pump
Sample Description

Temperature (°F) 7.19
pH 7.21
Dissolved Oxygen 8.99
SC 0.222
~~Salinity~~ turbidity 21.7

CONTAINER DESCRIPTION: From Lab ARCADIS

Bottle Type	Analysis	Preservative
40mL VOA	VOC	HCL
500mL Perchlorate	perchlorate	—
250mL Amber	1,4 Dioxane	—

ARCADIS

Surface Water Sample Log

Sample ID SW-7B
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel AF/KM
Time 1200
Weather Sunny ~ 50°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water
Velocity
Other Comments
Substrate Description
Location verified by map
Description of Nearby Vegetation

FIELD PARAMETERS:

Sample Method peri pump
Sample Description

Temperature (°C/F) 7.60
pH 7.35
Dissolved Oxygen 9.84
SC 0.197
~~Salinity~~ turbidity 4.40

CONTAINER DESCRIPTION: From Lab ARCADIS

Bottle Type	Analysis	Preservative
40 mL VOA	VOC's	HCL
500mL Plastic	Perchlorate	—
250mL Amber	1,4 Dioxane	—

ARCADIS

Pore Water Sample Log

Sample ID PW-2B
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel AF/KM.
Time 0900
Weather Sunny ~ 30°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water 14"
Velocity
Depth Advanced into Sediment 12"
Substrate Description sand & gravel
Location verified by map

Description of Nearby Vegetation grasses & briars

FIELD PARAMETERS:

Sample Method peristaltic pump
Sample Description

Temperature (°C/°F) 5.32
pH 6.72
Dissolved Oxygen (mg/L) 6.81
SC 0.191
Turbidity (mV)
Turbidity (NTU) 2.21

CONTAINER DESCRIPTION:

~~Bottle Type~~ Analysis	~~Analysis~~ Bottles	Preservative	
VOCs	40mL VOA	HCl	3
SVOCs	1L Amber	none	2
Perchlorate	500mL Plastic	none	1
metals	250mL Plastic	HNO_3	1
Sulfate	150mL Plastic	none	1
TOC	40mL VOA Amber	H_2SO_4	3
dissolved Iron	250mL Plastic	HNO_3	1

ARCADIS

Pore Water Sample Log

Sample ID PW-6C

Project/No. MD001006.0006

Date 3-27-19

Sampling Personnel AF/KM.

Time 1030

Weather sunny ~40°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek

Depth of Water 13"

Velocity

Depth Advanced into Sediment 12 inches

Substrate Description sand & gravel

Location verified by map

Description of Nearby Vegetation trees, grasses

FIELD PARAMETERS:

Sample Method peri pump

Sample Description

Temperature (°C/°F) 6.27

pH 7.12

Dissolved Oxygen (mg/L) 9.36

SC 0.196

Turbidity (mV) —

Turbidity (NTU) 3.87

CONTAINER DESCRIPTION:

Bottle Type	Analysis	Preservative
40mL VOA	VOCs/TOC	HCL/Sulfuric Acid
125mL plastic	Sulfate	—
250mL plastic	Dissolved Iron	Nitric Acid
500mL Plastic	Perchlorate	—
250mL Amber	1,4 Dioxane	—

ARCADIS

Pore Water Sample Log

Sample ID PW-6D
Project/No. MD001006.0006
Date 3-27-19
Sampling Personnel AF/KM
Time 1045
Weather sunny ~ 40°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body Little Elk Creek
Depth of Water
Velocity
Depth Advanced into Sediment 2 ft
Substrate Description
Location verified by map
Description of Nearby Vegetation trees, grassy

FIELD PARAMETERS:

Sample Method perri pump
Sample Description

Temperature (°C/°F) 7.19
pH 7.21
Dissolved Oxygen (mg/L) 8.99
SC 0.222
Turbidity (mV) [redacted]
Turbidity (NTU) 21.7

CONTAINER DESCRIPTION:

Bottle Type	Analysis	Preservative
40mL VOA	VOC/TOC	HCl/Sulfuric acid
[redacted]		
125mL Plastic	Sulfate	—
250mL Amber	1,4, Dioxane	—
250mL Plastic	Dissolved Iron	Nitric Acid
500mL Plastic	perchlorate	—

Document Control Number: TGM - MD0010060006
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital		**Project Location:** Elkton, MD	
Date: 3/19/18	**Time:** 0810	**Conducted by:** Andy Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 ~~Well Setups~~
3 well sampling
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities): **Check if yes**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category:

☐ Gravity (i.e., ladder, scaffold, trips)	(L M H)	☒ Motion (i.e., traffic, moving water)	(L M H) traffic	☐ Mechanical (i.e., augers, motors)	(L M H)
☐ Electrical (i.e., utilities, lightning)	(L M H)	☐ Pressure (i.e. gas cylinders, wells)	(L M H)	☒ Environment (i.e., heat, cold, ice)	(L M H) cold
☐ Chemical (i.e., fuel, acid, paint)	(L M H)	☐ Biological (i.e., ticks, poison ivy)	(L M H)	☒ Radiation (i.e., alpha, sun, laser)	(L M H) sun
☐ Sound (i.e., machinery, generators)	(L M H)	☐ Personal (i.e. alone, night, not fit)	(L M H)	☐ Driving (i.e. car, ATV, boat, dozer)	(L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Arcadis /	AF 0815	AF	✓
Katie Morrison / Arcadis /	KM 0815	KM	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number:TGM - MD001006.0002
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital		**Project Location:** Elkton, MD	
Date: 3/20/19	**Time:** 0825	**Conducted by:** Andy Feild	**Signature/Title:** Field tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 well sampling
3
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes:**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☑ Staff has appropriate PPE?	☑ Staff knows Emergency Plan (EAP)?	☑ All equipment checked & OK?
		☑ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips)	(L M H)	☑ Motion (i.e., traffic, moving water)	(L) M H) traffic	☐ Mechanical (i.e., augers, motors)	(L M H)
☐ Electrical (i.e., utilities, lightning)	(L M H)	☐ Pressure (i.e. gas cylinders, wells)	(L M H)	☑ Environment (i.e., heat, cold, ice)	(L) M H) wind
☐ Chemical (i.e., fuel, acid, paint)	(L M H)	☐ Biological (i.e., ticks, poison ivy)	(L M H)	☑ Radiation (i.e., alpha, sun, laser)	(L (M) H) sun
☐ Sound (i.e., machinery, generators)	(L M H)	☐ Personal (i.e. alone, night, not fit)	(L M H)	☐ Driving (i.e. car, ATV, boat, dozer)	(L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Arcadis	AF 0830	AF	✓
Kate Manson / Arcadis	KM 0830	KM	✓

Important Information and Numbers

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In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number: TGM - MD001006.0066
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital Elkton			**Project Location:** Elkton, MD
Date: 3-21-19	**Time:** 0810	**Conducted by:** Andy Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 well sampling
3
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post-activities) **Check if yes:**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☒ Motion (i.e., traffic, moving water) (L M H) traffic	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M (H)) cold, rain
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

☐ Elimination	☐ Substitution	☐ Isolation
☐ Engineering controls	☐ Administrative controls	☐ Monitoring
☐ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☐ Personal Hygiene	☐ Exposure Guidelines	☐ Decon Procedures
☐ Emergency Action Plan (EAP)	☐ Fall Protection	☐ Work Zones/Site Control
☐ JSA to be developed/used ***(specify)***	☐ TIP conducted ***(specify job/JSA)***	☐ Traffic Control
		☐ Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Aradis / [signature]	AF/0810	AF	✓
Michael Kedenburg / Aradis / [signature]	MK/0810	MK	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In Out

In Out

In Out

In Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

☐ Lessons learned and best practices learned today: _____

☐ Incidents that occurred today: _____

☐ Any Stop Work interventions today? _____

☐ Corrective/Preventive Actions needed for future work: _____

☐ Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number:TGM - MD001606.0006
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital			**Project Location:** Elkton, MD
Date: 3/22/19	**Time:** 0900	**Conducted by:** Andy Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving 3 5
2 well sampling 4 6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's open activities). **Check if yes:**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☑ Staff has appropriate PPE?	☑ Staff knows Emergency Plan (EAP)?	☑ All equipment checked & OK?
		☑ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips)	(L M H)	☑ Motion (i.e., traffic, moving water)	(L M H) traffic	☐ Mechanical (i.e., augers, motors)	(L M H)
☐ Electrical (i.e., utilities, lightning)	(L M H)	☐ Pressure (i.e. gas cylinders, wells)	(L M H)	☑ Environment (i.e., heat, cold, ice)	(L M H) cold rain wind
☐ Chemical (i.e., fuel, acid, paint)	(L M H)	☐ Biological (i.e., ticks, poison ivy)	(L M H)	☐ Radiation (i.e., alpha, sun, laser)	(L M H)
☐ Sound (i.e., machinery, generators)	(L M H)	☐ Personal (i.e. alone, night, not fit)	(L M H)	☐ Driving (i.e. car, ATV, boat, dozer)	(L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Arcadis /	AF/0905	AF	✓
Katie Morrison / Arcadis /	K/0905	KM	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number: TGM - MD001006.0006
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital		**Project Location:** Elkton, MD	
Date: 5/25/19	**Time:** 0750	**Conducted by:** Andy Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 well sampling
3 chain saw cutting
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities) **Check if yes:**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category:

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☒ Motion (i.e., traffic, moving water) (L M H) traffic	☒ Mechanical (i.e., augers, motors) (L M H) chain saw	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H) cold	
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☒ Radiation (i.e., alpha, sun, laser) (L M H) sun	
☒ Sound (i.e., machinery, generators) (L M H) chainsaw	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)	

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Aradis	AF 0750	AF	✓
Katie Morrison / Aradis	KM 0750	KM	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB, I** will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number:TGM - MD001606.0006
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital		**Project Location:** Elkton, MD	
Date: ~~3~~/26	**Time:** 0740	**Conducted by:** Andy Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 well sampling
3
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities): **Check if yes:**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☐ Gravity (i.e., ladder, scaffold, trips) (L M H)	☒ Motion (i.e., traffic, moving water) (L M H) traffic	☐ Mechanical (i.e., augers, motors) (L M H)	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H) cold	
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☒ Radiation (i.e., alpha, sun, laser) (L M H) sun	
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☐ Driving (i.e. car, ATV, boat, dozer) (L M H)	

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Arcadis	AF/0740	AF	✓
Kathy Morrison / Arcadis	KM/0740	~~KP~~ KM	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number:TGM - MD001006.0006
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: ATK Orbital		**Project Location:** Elkton, MD	
Date: 3/27	**Time:** 0800	**Conducted by:** A. Feild	**Signature/Title:** Field Tech
Client:		**Client Contact:**	**Subcontractor companies:**

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Driving
2 water sampling
3
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here:

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☐ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☐ JSAs or procedures are available?	☐ Field teams to "dirty" JSAs, as needed?	☑ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☑ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category:

☐ Gravity (i.e., ladder, scaffold, trips)	(L M H)	☒ Motion (i.e., traffic, moving water) traffic, water	(L M H)	☐ Mechanical (i.e., augers, motors)	(L M H)
☐ Electrical (i.e., utilities, lightning)	(L M H)	☐ Pressure (i.e. gas cylinders, wells)	(L M H)	☒ Environment (i.e., heat, cold, ice) cold	(L M (H))
☐ Chemical (i.e., fuel, acid, paint)	(L M H)	☐ Biological (i.e., ticks, poison ivy)	(L M H)	☒ Radiation (i.e., alpha, sun, laser) sun	((L) M H)
☐ Sound (i.e., machinery, generators)	(L M H)	☐ Personal (i.e. alone, night, not fit)	(L M H)	☐ Driving (i.e. car, ATV, boat, dozer)	(L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [ ] General PPE Usage
- [ ] Personal Hygiene
- [ ] Emergency Action Plan (EAP)
- [ ] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [ ] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Andy Feild / Arcadis /	AF/0805	AF/	✓
Katie Mamsa / Arcadis /	KM/0805	KM/	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In _____ Out _____

In _____ Out _____

In _____ Out _____

In _____ Out _____

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

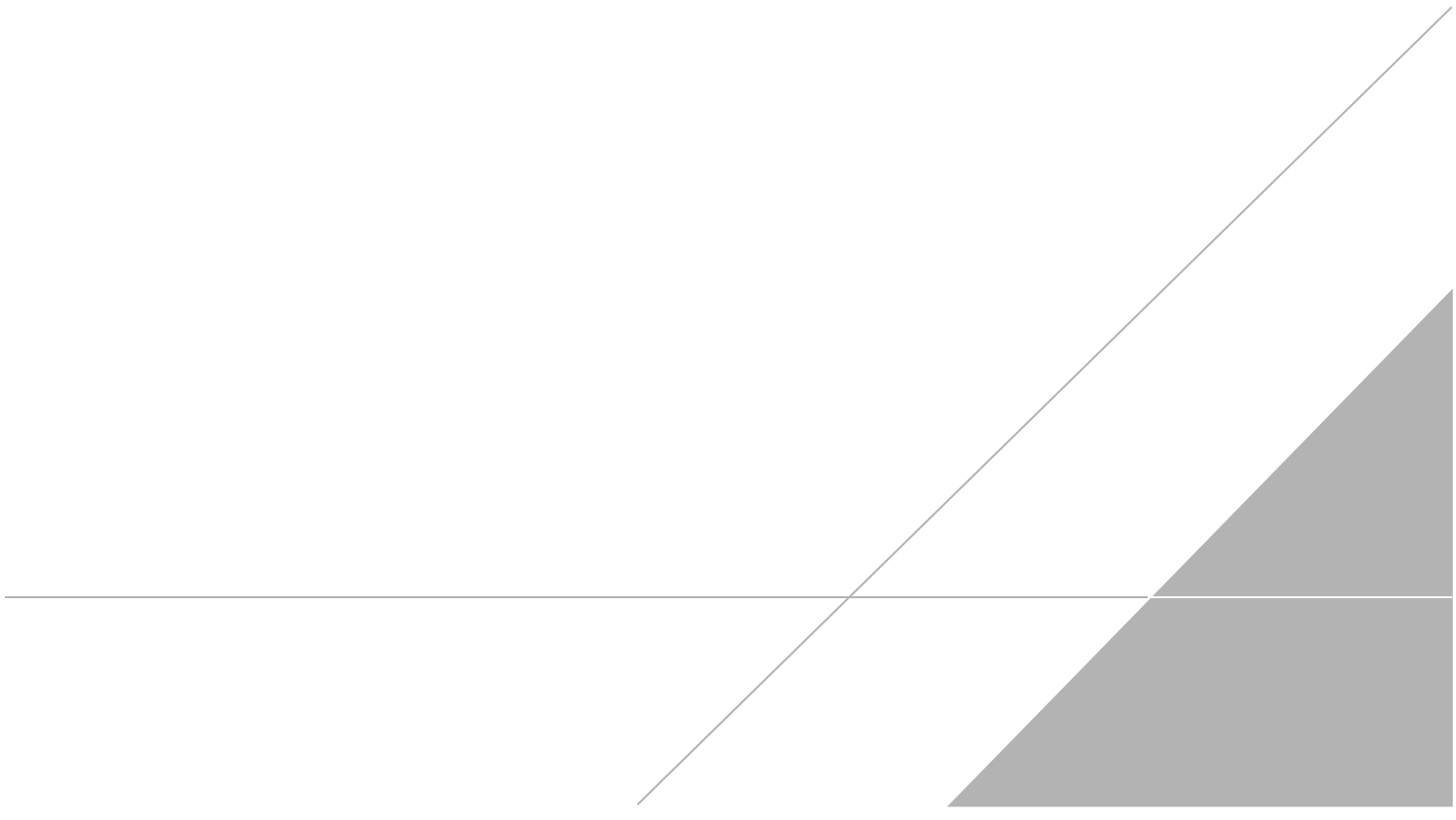
- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

APPENDIX C

Analytical Reports



eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-166219-1
Client Project/Site: ATK Orbital Elkton

For:
ARCADIS U.S., Inc.
7550 Teague Road
Suite 210
Hanover, Maryland 21076

Attn: Ms. Tina Armstrong

Authorized for release by:
4/4/2019 6:26:19 PM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 680-166219-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: ATK Orbital Elkton

Report Number: 680-166219-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 03/21/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples GM-1B (031919) (680-166219-1), GM-4B (031919) (680-166219-2), GM-14M (031919) (680-166219-3), GM-14S (031919) (680-166219-4), GM-15M (031919) (680-166219-5), GM-24 (031919) (680-166219-6), DUP01 (031919) (680-166219-7) and TB01 (031919) (680-166219-8) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/28/2019 and 03/29/2019.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-564057 recovered outside control limits for the following analytes: Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Sample GM-14M (031919) (680-166219-3)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-564054, 680-564057,and 680-564241.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS BY GCMS - LOW LEVEL

Samples GM-1B (031919) (680-166219-1), GM-4B (031919) (680-166219-2), GM-14M (031919) (680-166219-3), GM-14S (031919) (680-166219-4) and GM-24 (031919) (680-166219-6) were analyzed for Semivolatile Organic Compounds by GCMS - Low Level in accordance with EPA SW-846 Method 8270D. The samples were prepared on 03/25/2019 and analyzed on 03/26/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCHLORATE (IC)

Samples GM-1B (031919) (680-166219-1), GM-4B (031919) (680-166219-2), GM-14M (031919) (680-166219-3), GM-14S (031919) (680-166219-4), GM-15M (031919) (680-166219-5), GM-24 (031919) (680-166219-6) and DUP01 (031919) (680-166219-7) were analyzed for perchlorate (IC) in accordance with EPA Method 314.0. The samples were analyzed on 03/29/2019 and 04/01/2019.

Samples GM-1B (031919) (680-166219-1)[10X], GM-14M (031919) (680-166219-3)[10X] and GM-24 (031919) (680-166219-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Job ID: 680-166219-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP) - DISSOLVED

Samples GM-1B (031919) (680-166219-1) and GM-14M (031919) (680-166219-3) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 03/28/2019 and analyzed on 03/30/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples GM-1B (031919) (680-166219-1) and GM-14M (031919) (680-166219-3) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 04/03/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples GM-1B (031919) (680-166219-1) and GM-14M (031919) (680-166219-3) were analyzed for total organic carbon in accordance with SM 5310B. The samples were analyzed on 04/03/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-166219-1	GM-1B (031919)	Water	03/19/19 15:30	03/21/19 08:47
680-166219-2	GM-4B (031919)	Water	03/19/19 13:50	03/21/19 08:47
680-166219-3	GM-14M (031919)	Water	03/19/19 10:55	03/21/19 08:47
680-166219-4	GM-14S (031919)	Water	03/19/19 10:55	03/21/19 08:47
680-166219-5	GM-15M (031919)	Water	03/19/19 13:55	03/21/19 08:47
680-166219-6	GM-24 (031919)	Water	03/19/19 16:20	03/21/19 08:47
680-166219-7	DUP01 (031919)	Water	03/19/19 08:00	03/21/19 08:47
680-166219-8	TB01 (031919)	Water	03/19/19 00:00	03/21/19 08:47

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL EDI
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
314.0	Perchlorate (IC)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL SAV
5310 B-2011	Organic Carbon, Total (TOC)	SM	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL EDI
5030B	Purge and Trap	SW846	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919) — Lab Sample ID: 680-166219-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.6		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	1.8		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	1.6	J	2.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	40		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	3.7		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	2.1		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	62		10	2.8	ug/L	10		314.0	Total/NA
Total Organic Carbon	0.76	J	1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: GM-4B (031919) — Lab Sample ID: 680-166219-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	0.57	J	10	0.30	ug/L	1		8260B	Total/NA
Tetrachloroethene	1.4		1.0	0.74	ug/L	1		8260B	Total/NA
Trichloroethene	13		1.0	0.48	ug/L	1		8260B	Total/NA
Trichlorofluoromethane	0.46	J	1.0	0.42	ug/L	1		8260B	Total/NA
Perchlorate	1.4		1.0	0.28	ug/L	1		314.0	Total/NA

Client Sample ID: GM-14M (031919) — Lab Sample ID: 680-166219-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.84	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	40		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	5.1		1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.79	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	28		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	41		2.0	0.37	ug/L	1		8260B	Total/NA
Tetrachloroethene	1.2		1.0	0.74	ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	0.46	J	1.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	4.5		1.0	0.37	ug/L	1		8260B	Total/NA
Vinyl chloride	6.4		1.0	0.50	ug/L	1		8260B	Total/NA
Trichloroethene - DL	270		2.0	0.96	ug/L	2		8260B	Total/NA
1,4-Dioxane	4.7		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	8.5		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	96		10	2.8	ug/L	10		314.0	Total/NA
Dissolved Iron	130		50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	1.2		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: GM-14S (031919) — Lab Sample ID: 680-166219-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	86		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	9.2		1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	2.7		1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	27		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	86		2.0	0.37	ug/L	1		8260B	Total/NA
Toluene	5.8		1.0	0.48	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	1.6		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	8.4		1.0	0.48	ug/L	1		8260B	Total/NA
Vinyl chloride	13		1.0	0.50	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: GM-14S (031919) (Continued) — Lab Sample ID: 680-166219-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	9.8		0.40	0.17	ug/L	1		8270D SIM	Total/NA

Client Sample ID: GM-15M (031919) — Lab Sample ID: 680-166219-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.67	J	1.0	0.41	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	0.67	J	2.0	0.37	ug/L	1		8260B	Total/NA
Methyl tert-butyl ether	0.80	J	10	0.30	ug/L	1		8260B	Total/NA
1,1,2,2-Tetrachloroethane	13		1.0	0.62	ug/L	1		8260B	Total/NA
Tetrachloroethene	2.0		1.0	0.74	ug/L	1		8260B	Total/NA
Trichloroethene	4.5		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	44		1.0	0.28	ug/L	1		314.0	Total/NA

Client Sample ID: GM-24 (031919) — Lab Sample ID: 680-166219-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.75	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	2.0		1.0	0.36	ug/L	1		8260B	Total/NA
Trichloroethene	20		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	130		10	2.8	ug/L	10		314.0	Total/NA

Client Sample ID: DUP01 (031919) — Lab Sample ID: 680-166219-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.56	J	1.0	0.41	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	0.56	J	2.0	0.37	ug/L	1		8260B	Total/NA
1,1,2,2-Tetrachloroethane	13		1.0	0.62	ug/L	1		8260B	Total/NA
Tetrachloroethene	1.9		1.0	0.74	ug/L	1		8260B	Total/NA
Trichloroethene	4.4		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	43		1.0	0.28	ug/L	1		314.0	Total/NA

Client Sample ID: TB01 (031919) — Lab Sample ID: 680-166219-8

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919)
Date Collected: 03/19/19 15:30
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 16:35	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 16:35	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 16:35	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 16:35	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 16:35	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 16:35	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 16:35	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 16:35	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 16:35	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
cis-1,2-Dichloroethene	**1.6**		1.0	0.41	ug/L			03/28/19 16:35	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 16:35	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 16:35	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 16:35	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 16:35	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 16:35	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 16:35	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 16:35	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
1,1-Dichloroethene	**1.8**		1.0	0.36	ug/L			03/28/19 16:35	1
1,2-Dichloroethene, Total	**1.6**	**J**	2.0	0.37	ug/L			03/28/19 16:35	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 16:35	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 16:35	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 16:35	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 16:35	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 16:35	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 16:35	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 16:35	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 16:35	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 16:35	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 16:35	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 16:35	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919)
Date Collected: 03/19/19 15:30
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 16:35	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 16:35	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 16:35	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Trichloroethene	**40**		1.0	0.48	ug/L			03/28/19 16:35	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 16:35	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 16:35	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 16:35	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 16:35	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/28/19 16:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 16:35*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/28/19 16:35*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 16:35*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.7**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 03:29	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 03:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*117*		*38 - 125*	*03/25/19 10:14*	*03/26/19 03:29*	*1*
Terphenyl-d14	*92*		*70 - 130*	*03/25/19 10:14*	*03/26/19 03:29*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**2.1**		1.0	0.40	mg/L			04/03/19 13:29	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**62**		10	2.8	ug/L			04/01/19 20:36	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/28/19 10:39	03/30/19 03:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.76**	**J**	1.0	0.50	mg/L			04/03/19 07:32	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-4B (031919)
Date Collected: 03/19/19 13:50
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:01	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:01	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 17:01	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:01	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:01	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:01	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 17:01	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:01	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:01	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 17:01	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:01	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:01	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:01	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:01	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:01	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:01	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 17:01	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 17:01	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 17:01	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:01	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:01	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:01	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:01	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:01	1
Methyl tert-butyl ether	**0.57**	**J**	10	0.30	ug/L			03/28/19 17:01	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:01	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:01	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:01	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:01	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:01	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:01	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-4B (031919)
Date Collected: 03/19/19 13:50
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:01	1
Tetrachloroethene	**1.4**		1.0	0.74	ug/L			03/28/19 17:01	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 17:01	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:01	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Trichloroethene	**13**		1.0	0.48	ug/L			03/28/19 17:01	1
Trichlorofluoromethane	**0.46**	**J**	1.0	0.42	ug/L			03/28/19 17:01	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:01	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:01	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:01	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:01	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/28/19 17:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/28/19 17:01*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/28/19 17:01*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 17:01*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 03:50	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 03:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*110*		*38 - 125*	*03/25/19 10:14*	*03/26/19 03:50*	*1*
Terphenyl-d14	*83*		*70 - 130*	*03/25/19 10:14*	*03/26/19 03:50*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.4**		1.0	0.28	ug/L			03/29/19 04:08	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:26	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:26	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:26	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 17:26	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:26	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:26	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:26	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 17:26	1
Chloroform	**0.84**	**J**	1.0	0.50	ug/L			03/28/19 17:26	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:26	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:26	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
cis-1,2-Dichloroethene	**40**		1.0	0.41	ug/L			03/28/19 17:26	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:26	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:26	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:26	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:26	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:26	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:26	1
1,1-Dichloroethane	**5.1**		1.0	0.38	ug/L			03/28/19 17:26	1
1,2-Dichloroethane	**0.79**	**J**	1.0	0.50	ug/L			03/28/19 17:26	1
1,1-Dichloroethene	**28**		1.0	0.36	ug/L			03/28/19 17:26	1
1,2-Dichloroethene, Total	**41**		2.0	0.37	ug/L			03/28/19 17:26	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:26	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:26	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:26	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:26	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:26	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 17:26	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:26	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:26	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:26	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:26	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:26	1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:26	1
Tetrachloroethene	**1.2**		1.0	0.74	ug/L			03/28/19 17:26	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 17:26	1
trans-1,2-Dichloroethene	**0.46**	**J**	1.0	0.37	ug/L			03/28/19 17:26	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
1,1,1-Trichloroethane	**4.5**		1.0	0.37	ug/L			03/28/19 17:26	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:26	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:26	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:26	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:26	1
Vinyl chloride	**6.4**		1.0	0.50	ug/L			03/28/19 17:26	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 17:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 17:26*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 17:26*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 17:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**270**		2.0	0.96	ug/L			03/29/19 13:16	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/29/19 13:16*	*2*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*03/29/19 13:16*	*2*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*03/29/19 13:16*	*2*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/29/19 13:16*	*2*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4.7**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:12	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*115*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:12*	*1*
Terphenyl-d14	*92*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:12*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**8.5**		1.0	0.40	mg/L			04/03/19 13:42	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**96**		10	2.8	ug/L			04/01/19 22:08	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	130		50	17	ug/L		03/28/19 10:39	03/30/19 03:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.2		1.0	0.50	mg/L			04/03/19 07:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14S (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:52	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:52	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:52	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 17:52	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:52	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:52	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:52	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 17:52	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 17:52	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:52	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:52	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
cis-1,2-Dichloroethene	**86**		1.0	0.41	ug/L			03/28/19 17:52	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:52	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:52	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:52	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:52	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:52	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:52	1
1,1-Dichloroethane	**9.2**		1.0	0.38	ug/L			03/28/19 17:52	1
1,2-Dichloroethane	**2.7**		1.0	0.50	ug/L			03/28/19 17:52	1
1,1-Dichloroethene	**27**		1.0	0.36	ug/L			03/28/19 17:52	1
1,2-Dichloroethene, Total	**86**		2.0	0.37	ug/L			03/28/19 17:52	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:52	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:52	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:52	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:52	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:52	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 17:52	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:52	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:52	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:52	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:52	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14S (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:52	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 17:52	1
Toluene	**5.8**		1.0	0.48	ug/L			03/28/19 17:52	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
1,1,1-Trichloroethane	**1.6**		1.0	0.37	ug/L			03/28/19 17:52	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Trichloroethene	**8.4**		1.0	0.48	ug/L			03/28/19 17:52	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:52	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:52	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:52	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:52	1
Vinyl chloride	**13**		1.0	0.50	ug/L			03/28/19 17:52	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 17:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*		*03/28/19 17:52*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*03/28/19 17:52*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 17:52*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**9.8**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:33	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:33*	*1*
Terphenyl-d14	*80*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:33*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			03/29/19 04:54	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-15M (031919)
Date Collected: 03/19/19 13:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 18:18	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 18:18	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 18:18	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 18:18	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 18:18	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 18:18	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 18:18	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 18:18	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 18:18	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
cis-1,2-Dichloroethene	**0.67**	**J**	1.0	0.41	ug/L			03/28/19 18:18	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 18:18	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 18:18	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 18:18	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 18:18	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 18:18	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 18:18	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 18:18	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 18:18	1
1,2-Dichloroethene, Total	**0.67**	**J**	2.0	0.37	ug/L			03/28/19 18:18	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 18:18	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 18:18	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 18:18	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 18:18	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 18:18	1
Methyl tert-butyl ether	**0.80**	**J**	10	0.30	ug/L			03/28/19 18:18	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:18	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 18:18	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 18:18	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 18:18	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 18:18	1

Client Sample ID: GM-15M (031919)
Date Collected: 03/19/19 13:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1,2,2-Tetrachloroethane	**13**		1.0	0.62	ug/L			03/28/19 18:18	1
Tetrachloroethene	**2.0**		1.0	0.74	ug/L			03/28/19 18:18	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 18:18	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Trichloroethene	**4.5**		1.0	0.48	ug/L			03/28/19 18:18	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 18:18	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:18	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 18:18	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 18:18	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 18:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 18:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 18:18*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 18:18*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 18:18*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**44**		1.0	0.28	ug/L			03/29/19 05:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-24 (031919)
Date Collected: 03/19/19 16:20
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 14:52	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 14:52	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 14:52	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 14:52	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 14:52	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 14:52	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 14:52	1
Chloroform	**0.75**	**J**	1.0	0.50	ug/L			03/28/19 14:52	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 14:52	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 14:52	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 14:52	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 14:52	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 14:52	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 14:52	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 14:52	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 14:52	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 14:52	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 14:52	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
1,1-Dichloroethene	**2.0**		1.0	0.36	ug/L			03/28/19 14:52	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 14:52	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 14:52	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 14:52	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 14:52	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 14:52	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 14:52	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 14:52	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 14:52	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 14:52	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 14:52	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 14:52	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 14:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-24 (031919)
Date Collected: 03/19/19 16:20
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 14:52	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 14:52	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 14:52	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Trichloroethene	**20**		1.0	0.48	ug/L			03/28/19 14:52	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 14:52	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 14:52	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 14:52	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 14:52	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/28/19 14:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/28/19 14:52*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 14:52*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 14:52*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:55	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:55*	*1*
Terphenyl-d14	*73*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:55*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**130**		10	2.8	ug/L			04/01/19 22:31	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: DUP01 (031919)
Date Collected: 03/19/19 08:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 18:44	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 18:44	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 18:44	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 18:44	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 18:44	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 18:44	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 18:44	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 18:44	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 18:44	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
cis-1,2-Dichloroethene	**0.56**	**J**	1.0	0.41	ug/L			03/28/19 18:44	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 18:44	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 18:44	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 18:44	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 18:44	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 18:44	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 18:44	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 18:44	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 18:44	1
1,2-Dichloroethene, Total	**0.56**	**J**	2.0	0.37	ug/L			03/28/19 18:44	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 18:44	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 18:44	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 18:44	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 18:44	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 18:44	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 18:44	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:44	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 18:44	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 18:44	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 18:44	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 18:44	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: DUP01 (031919)
Date Collected: 03/19/19 08:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1,2,2-Tetrachloroethane	**13**		1.0	0.62	ug/L			03/28/19 18:44	1
Tetrachloroethene	**1.9**		1.0	0.74	ug/L			03/28/19 18:44	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 18:44	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Trichloroethene	**4.4**		1.0	0.48	ug/L			03/28/19 18:44	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 18:44	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:44	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 18:44	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 18:44	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/28/19 18:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 18:44*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 18:44*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 18:44*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**43**		1.0	0.28	ug/L			03/29/19 06:02	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: TB01 (031919)
Date Collected: 03/19/19 00:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 11:22	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 11:22	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 11:22	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 11:22	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 11:22	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 11:22	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 11:22	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 11:22	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 11:22	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 11:22	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 11:22	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 11:22	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 11:22	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 11:22	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 11:22	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 11:22	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 11:22	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 11:22	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 11:22	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 11:22	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 11:22	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 11:22	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 11:22	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 11:22	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:22	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 11:22	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 11:22	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 11:22	1

Client Sample ID: TB01 (031919)
Date Collected: 03/19/19 00:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 11:22	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 11:22	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 11:22	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:22	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 11:22	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 11:22	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 11:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/28/19 11:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/28/19 11:22*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 122*		*03/28/19 11:22*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*03/28/19 11:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-166219-1	GM-1B (031919)	101	88	93	99
680-166219-2	GM-4B (031919)	103	89	93	98
680-166219-3	GM-14M (031919)	102	88	94	98
680-166219-3 - DL	GM-14M (031919)	99	96	100	99
680-166219-4	GM-14S (031919)	102	90	95	99
680-166219-5	GM-15M (031919)	102	88	94	98
680-166219-6	GM-24 (031919)	103	89	94	99
680-166219-7	DUP01 (031919)	104	88	94	98
680-166219-8	TB01 (031919)	97	95	104	93
LCS 680-564054/3	Lab Control Sample	102	95	99	94
LCS 680-564057/4	Lab Control Sample	101	90	98	97
LCS 680-564241/4	Lab Control Sample	102	90	96	99
LCSD 680-564054/4	Lab Control Sample Dup	99	91	97	94
LCSD 680-564057/5	Lab Control Sample Dup	100	88	96	96
LCSD 680-564241/5	Lab Control Sample Dup	103	89	96	98
MB 680-564054/8	Method Blank	97	93	103	92
MB 680-564057/8	Method Blank	104	87	94	100
MB 680-564241/8	Method Blank	103	86	93	98

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		NBZ	TPHL
Lab Sample ID	Client Sample ID	(38-125)	(70-130)
680-166219-1	GM-1B (031919)	117	92
680-166219-2	GM-4B (031919)	110	83
680-166219-3	GM-14M (031919)	115	92
680-166219-4	GM-14S (031919)	94	80
680-166219-6	GM-24 (031919)	94	73
MB 460-597718/1-A	Method Blank	97	86

Surrogate Legend

NBZ = Nitrobenzene-d5
TPHL = Terphenyl-d14

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-564054/8
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 10:39	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 10:39	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 10:39	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 10:39	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 10:39	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 10:39	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 10:39	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 10:39	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 10:39	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 10:39	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 10:39	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 10:39	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 10:39	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 10:39	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 10:39	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 10:39	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 10:39	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 10:39	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 10:39	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 10:39	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 10:39	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 10:39	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 10:39	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 10:39	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 10:39	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 10:39	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 10:39	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 10:39	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 10:39	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 10:39	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 10:39	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 10:39	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 10:39	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 10:39	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 10:39	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 10:39	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 10:39	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 10:39	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 10:39	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 10:39	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 10:39	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 10:39	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 10:39	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 10:39	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564054/8
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 10:39	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 10:39	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 10:39	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 10:39	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 10:39	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 10:39	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 10:39	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 10:39	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 10:39	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 10:39	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 10:39	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/28/19 10:39	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 10:39	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 10:39	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 10:39	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 10:39	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 10:39	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 10:39	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 10:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/28/19 10:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*03/28/19 10:39*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 122*		*03/28/19 10:39*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*03/28/19 10:39*	*1*

Lab Sample ID: LCS 680-564054/3
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	279		ug/L		111	70 - 135
Benzene	50.0	51.6		ug/L		103	80 - 120
Bromobenzene	50.0	50.2		ug/L		100	80 - 121
Bromochloromethane	50.0	53.0		ug/L		106	80 - 120
Bromodichloromethane	50.0	53.4		ug/L		107	80 - 120
Bromoform	50.0	51.3		ug/L		103	74 - 126
Bromomethane	50.0	50.0		ug/L		100	62 - 130
2-Butanone	250	261		ug/L		104	80 - 131
Carbon disulfide	50.0	53.7		ug/L		107	80 - 120
Carbon tetrachloride	50.0	53.1		ug/L		106	76 - 123
Chlorobenzene	50.0	50.5		ug/L		101	80 - 120
Chloroethane	50.0	53.1		ug/L		106	66 - 135
2-Chloroethyl vinyl ether	50.0	54.9		ug/L		110	71 - 135
Chloroform	50.0	51.3		ug/L		103	80 - 120
Chloromethane	50.0	58.9		ug/L		118	69 - 131
2-Chlorotoluene	50.0	47.9		ug/L		96	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564054/3
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	49.4		ug/L		99	80 - 120
cis-1,2-Dichloroethene	50.0	52.7		ug/L		105	80 - 120
cis-1,3-Dichloropropene	50.0	54.8		ug/L		110	80 - 120
Dibromochloromethane	50.0	53.3		ug/L		107	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	51.0		ug/L		102	71 - 134
1,2-Dibromoethane	50.0	53.2		ug/L		106	80 - 120
Dibromomethane	50.0	53.2		ug/L		106	80 - 120
1,2-Dichlorobenzene	50.0	49.7		ug/L		99	80 - 120
1,3-Dichlorobenzene	50.0	48.0		ug/L		96	80 - 120
1,4-Dichlorobenzene	50.0	50.0		ug/L		100	80 - 120
Dichlorodifluoromethane	50.0	61.5		ug/L		123	47 - 155
1,1-Dichloroethane	50.0	51.5		ug/L		103	80 - 120
1,2-Dichloroethane	50.0	49.9		ug/L		100	80 - 120
1,1-Dichloroethene	50.0	53.5		ug/L		107	76 - 120
1,2-Dichloroethene, Total	100	105		ug/L		105	80 - 120
1,2-Dichloropropane	50.0	52.4		ug/L		105	80 - 120
1,3-Dichloropropane	50.0	52.5		ug/L		105	80 - 120
2,2-Dichloropropane	50.0	53.2		ug/L		106	76 - 126
1,1-Dichloropropene	50.0	52.1		ug/L		104	80 - 120
Ethylbenzene	50.0	50.1		ug/L		100	80 - 120
Hexachlorobutadiene	50.0	50.8		ug/L		102	60 - 140
2-Hexanone	250	246		ug/L		98	74 - 127
Isopropylbenzene	50.0	50.2		ug/L		100	80 - 120
Methylene Chloride	50.0	53.1		ug/L		106	80 - 120
4-Methyl-2-pentanone	250	251		ug/L		100	76 - 124
Methyl tert-butyl ether	50.0	51.7		ug/L		103	80 - 120
m-Xylene & p-Xylene	50.0	50.7		ug/L		101	80 - 120
n-Butylbenzene	50.0	50.8		ug/L		102	80 - 120
N-Propylbenzene	50.0	51.0		ug/L		102	80 - 120
o-Xylene	50.0	51.1		ug/L		102	80 - 120
p-Isopropyltoluene	50.0	50.0		ug/L		100	80 - 120
sec-Butylbenzene	50.0	50.2		ug/L		100	80 - 120
Styrene	50.0	51.2		ug/L		102	80 - 120
tert-Butylbenzene	50.0	50.1		ug/L		100	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.4		ug/L		101	80 - 121
1,1,2,2-Tetrachloroethane	50.0	49.3		ug/L		99	80 - 120
Tetrachloroethene	50.0	53.4		ug/L		107	80 - 121
Toluene	50.0	50.8		ug/L		102	80 - 113
trans-1,2-Dichloroethene	50.0	52.5		ug/L		105	80 - 120
trans-1,3-Dichloropropene	50.0	53.7		ug/L		107	80 - 120
1,2,3-Trichlorobenzene	50.0	51.3		ug/L		103	61 - 141
1,2,4-Trichlorobenzene	50.0	52.1		ug/L		104	68 - 128
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	80 - 120
1,1,2-Trichloroethane	50.0	53.2		ug/L		106	80 - 120
Trichloroethene	50.0	53.1		ug/L		106	80 - 120
Trichlorofluoromethane	50.0	55.4		ug/L		111	60 - 141
1,2,3-Trichloropropane	50.0	48.0		ug/L		96	80 - 123
1,2,4-Trimethylbenzene	50.0	49.4		ug/L		99	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564054/3
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,3,5-Trimethylbenzene			50.0	49.3		ug/L		99	80 - 120		
Vinyl acetate			100	104		ug/L		104	67 - 135		
Vinyl chloride			50.0	56.3		ug/L		113	71 - 128		
Xylenes, Total			100	102		ug/L		102	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Lab Sample ID: LCSD 680-564054/4
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	265		ug/L		106	70 - 135	5	30
Benzene			50.0	50.6		ug/L		101	80 - 120	2	20
Bromobenzene			50.0	49.5		ug/L		99	80 - 121	2	20
Bromochloromethane			50.0	45.9		ug/L		92	80 - 120	14	20
Bromodichloromethane			50.0	52.8		ug/L		106	80 - 120	1	20
Bromoform			50.0	50.2		ug/L		100	74 - 126	2	20
Bromomethane			50.0	49.3		ug/L		99	62 - 130	1	20
2-Butanone			250	248		ug/L		99	80 - 131	5	20
Carbon disulfide			50.0	52.8		ug/L		106	80 - 120	2	20
Carbon tetrachloride			50.0	51.8		ug/L		104	76 - 123	2	20
Chlorobenzene			50.0	49.4		ug/L		99	80 - 120	2	20
Chloroethane			50.0	52.7		ug/L		105	66 - 135	1	20
2-Chloroethyl vinyl ether			50.0	52.9		ug/L		106	71 - 135	4	50
Chloroform			50.0	50.5		ug/L		101	80 - 120	2	20
Chloromethane			50.0	58.4		ug/L		117	69 - 131	1	30
2-Chlorotoluene			50.0	47.9		ug/L		96	80 - 120	0	20
4-Chlorotoluene			50.0	49.2		ug/L		98	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	52.2		ug/L		104	80 - 120	1	20
cis-1,3-Dichloropropene			50.0	53.6		ug/L		107	80 - 120	2	20
Dibromochloromethane			50.0	52.3		ug/L		105	80 - 121	2	20
1,2-Dibromo-3-Chloropropane			50.0	48.7		ug/L		97	71 - 134	5	20
1,2-Dibromoethane			50.0	51.7		ug/L		103	80 - 120	3	20
Dibromomethane			50.0	51.5		ug/L		103	80 - 120	3	20
1,2-Dichlorobenzene			50.0	48.5		ug/L		97	80 - 120	2	20
1,3-Dichlorobenzene			50.0	47.2		ug/L		94	80 - 120	2	20
1,4-Dichlorobenzene			50.0	48.6		ug/L		97	80 - 120	3	20
Dichlorodifluoromethane			50.0	57.8		ug/L		116	47 - 155	6	40
1,1-Dichloroethane			50.0	50.9		ug/L		102	80 - 120	1	20
1,2-Dichloroethane			50.0	49.4		ug/L		99	80 - 120	1	50
1,1-Dichloroethene			50.0	51.0		ug/L		102	76 - 120	5	20
1,2-Dichloroethene, Total			100	103		ug/L		103	80 - 120	2	20
1,2-Dichloropropane			50.0	51.6		ug/L		103	80 - 120	2	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564054/4
Matrix: Water
Analysis Batch: 564054

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3-Dichloropropane			50.0	51.3		ug/L		103	80 - 120	2	20
2,2-Dichloropropane			50.0	51.2		ug/L		102	76 - 126	4	20
1,1-Dichloropropene			50.0	50.6		ug/L		101	80 - 120	3	20
Ethylbenzene			50.0	49.5		ug/L		99	80 - 120	1	20
Hexachlorobutadiene			50.0	49.3		ug/L		99	60 - 140	3	20
2-Hexanone			250	236		ug/L		95	74 - 127	4	20
Isopropylbenzene			50.0	49.8		ug/L		100	80 - 120	1	20
Methylene Chloride			50.0	51.5		ug/L		103	80 - 120	3	20
4-Methyl-2-pentanone			250	239		ug/L		96	76 - 124	5	20
Methyl tert-butyl ether			50.0	49.9		ug/L		100	80 - 120	4	20
m-Xylene & p-Xylene			50.0	49.9		ug/L		100	80 - 120	1	20
n-Butylbenzene			50.0	50.7		ug/L		101	80 - 120	0	20
N-Propylbenzene			50.0	50.3		ug/L		101	80 - 120	1	20
o-Xylene			50.0	50.1		ug/L		100	80 - 120	2	30
p-Isopropyltoluene			50.0	49.3		ug/L		99	80 - 120	1	20
sec-Butylbenzene			50.0	49.6		ug/L		99	80 - 120	1	20
Styrene			50.0	50.0		ug/L		100	80 - 120	2	20
tert-Butylbenzene			50.0	50.0		ug/L		100	80 - 121	0	20
1,1,1,2-Tetrachloroethane			50.0	49.7		ug/L		99	80 - 121	2	20
1,1,2,2-Tetrachloroethane			50.0	47.2		ug/L		94	80 - 120	4	20
Tetrachloroethene			50.0	50.8		ug/L		102	80 - 121	5	20
Toluene			50.0	50.1		ug/L		100	80 - 113	1	20
trans-1,2-Dichloroethene			50.0	51.0		ug/L		102	80 - 120	3	20
trans-1,3-Dichloropropene			50.0	52.3		ug/L		105	80 - 120	3	30
1,2,3-Trichlorobenzene			50.0	50.4		ug/L		101	61 - 141	2	20
1,2,4-Trichlorobenzene			50.0	51.5		ug/L		103	68 - 128	1	20
1,1,1-Trichloroethane			50.0	50.0		ug/L		100	80 - 120	2	20
1,1,2-Trichloroethane			50.0	51.2		ug/L		102	80 - 120	4	20
Trichloroethene			50.0	53.1		ug/L		106	80 - 120	0	20
Trichlorofluoromethane			50.0	53.9		ug/L		108	60 - 141	3	20
1,2,3-Trichloropropane			50.0	45.8		ug/L		92	80 - 123	5	30
1,2,4-Trimethylbenzene			50.0	49.0		ug/L		98	80 - 120	1	20
1,3,5-Trimethylbenzene			50.0	49.1		ug/L		98	80 - 120	0	20
Vinyl acetate			100	98.8		ug/L		99	67 - 135	5	20
Vinyl chloride			50.0	53.6		ug/L		107	71 - 128	5	20
Xylenes, Total			100	100		ug/L		100	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*91*		*73 - 131*
Dibromofluoromethane (Surr)	*97*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564057/8
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 11:01	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 11:01	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 11:01	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 11:01	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 11:01	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 11:01	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 11:01	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 11:01	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 11:01	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 11:01	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/28/19 11:01	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 11:01	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 11:01	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 11:01	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 11:01	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 11:01	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 11:01	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 11:01	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 11:01	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 11:01	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 11:01	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 11:01	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 11:01	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 11:01	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 11:01	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 11:01	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 11:01	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 11:01	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 11:01	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 11:01	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 11:01	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 11:01	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 11:01	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 11:01	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 11:01	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 11:01	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 11:01	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 11:01	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 11:01	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:01	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 11:01	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 11:01	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 11:01	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 11:01	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564057/8
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 11:01	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 11:01	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:01	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 11:01	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 11:01	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 11:01	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 11:01	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 11:01	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:01	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:01	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 11:01	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/28/19 11:01	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 11:01	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 11:01	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:01	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 11:01	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 11:01	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 11:01	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/28/19 11:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/28/19 11:01*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 11:01*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/28/19 11:01*	*1*

Lab Sample ID: LCS 680-564057/4
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	251		ug/L		100	70 - 135
Benzene	50.0	51.5		ug/L		103	80 - 120
Bromobenzene	50.0	51.2		ug/L		102	80 - 121
Bromochloromethane	50.0	49.8		ug/L		100	80 - 120
Bromodichloromethane	50.0	51.4		ug/L		103	80 - 120
Bromoform	50.0	52.3		ug/L		105	74 - 126
Bromomethane	50.0	73.1	*	ug/L		146	62 - 130
2-Butanone	250	251		ug/L		101	80 - 131
Carbon disulfide	50.0	49.5		ug/L		99	80 - 120
Carbon tetrachloride	50.0	52.4		ug/L		105	76 - 123
Chlorobenzene	50.0	51.4		ug/L		103	80 - 120
Chloroethane	50.0	59.3		ug/L		119	66 - 135
2-Chloroethyl vinyl ether	50.0	48.4		ug/L		97	71 - 135
Chloroform	50.0	49.5		ug/L		99	80 - 120
Chloromethane	50.0	57.1		ug/L		114	69 - 131
2-Chlorotoluene	50.0	50.9		ug/L		102	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564057/4
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	51.2		ug/L		102	80 - 120
cis-1,2-Dichloroethene	50.0	52.7		ug/L		105	80 - 120
cis-1,3-Dichloropropene	50.0	52.0		ug/L		104	80 - 120
Dibromochloromethane	50.0	52.2		ug/L		104	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	53.0		ug/L		106	71 - 134
1,2-Dibromoethane	50.0	49.0		ug/L		98	80 - 120
Dibromomethane	50.0	50.6		ug/L		101	80 - 120
1,2-Dichlorobenzene	50.0	49.4		ug/L		99	80 - 120
1,3-Dichlorobenzene	50.0	49.4		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	50.3		ug/L		101	80 - 120
Dichlorodifluoromethane	50.0	45.3		ug/L		91	47 - 155
1,1-Dichloroethane	50.0	51.8		ug/L		104	80 - 120
1,2-Dichloroethane	50.0	45.6		ug/L		91	80 - 120
1,1-Dichloroethene	50.0	57.9		ug/L		116	76 - 120
1,2-Dichloroethene, Total	100	105		ug/L		105	80 - 120
1,2-Dichloropropane	50.0	52.9		ug/L		106	80 - 120
1,3-Dichloropropane	50.0	49.6		ug/L		99	80 - 120
2,2-Dichloropropane	50.0	56.3		ug/L		113	76 - 126
1,1-Dichloropropene	50.0	51.0		ug/L		102	80 - 120
Ethylbenzene	50.0	51.8		ug/L		104	80 - 120
Hexachlorobutadiene	50.0	54.0		ug/L		108	60 - 140
2-Hexanone	250	239		ug/L		96	74 - 127
Isopropylbenzene	50.0	52.0		ug/L		104	80 - 120
Methylene Chloride	50.0	49.7		ug/L		99	80 - 120
4-Methyl-2-pentanone	250	241		ug/L		97	76 - 124
Methyl tert-butyl ether	50.0	48.3		ug/L		97	80 - 120
m-Xylene & p-Xylene	50.0	51.5		ug/L		103	80 - 120
n-Butylbenzene	50.0	51.4		ug/L		103	80 - 120
N-Propylbenzene	50.0	52.1		ug/L		104	80 - 120
o-Xylene	50.0	51.6		ug/L		103	80 - 120
p-Isopropyltoluene	50.0	51.8		ug/L		104	80 - 120
sec-Butylbenzene	50.0	52.0		ug/L		104	80 - 120
Styrene	50.0	51.5		ug/L		103	80 - 120
tert-Butylbenzene	50.0	52.2		ug/L		104	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.4		ug/L		101	80 - 121
1,1,2,2-Tetrachloroethane	50.0	50.3		ug/L		101	80 - 120
Tetrachloroethene	50.0	53.8		ug/L		108	80 - 121
Toluene	50.0	51.4		ug/L		103	80 - 113
trans-1,2-Dichloroethene	50.0	52.6		ug/L		105	80 - 120
trans-1,3-Dichloropropene	50.0	48.5		ug/L		97	80 - 120
1,2,3-Trichlorobenzene	50.0	49.6		ug/L		99	61 - 141
1,2,4-Trichlorobenzene	50.0	51.1		ug/L		102	68 - 128
1,1,1-Trichloroethane	50.0	50.9		ug/L		102	80 - 120
1,1,2-Trichloroethane	50.0	51.2		ug/L		102	80 - 120
Trichloroethene	50.0	51.0		ug/L		102	80 - 120
Trichlorofluoromethane	50.0	56.0		ug/L		112	60 - 141
1,2,3-Trichloropropane	50.0	50.5		ug/L		101	80 - 123
1,2,4-Trimethylbenzene	50.0	52.4		ug/L		105	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564057/4
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,3,5-Trimethylbenzene	50.0	52.0		ug/L		104	80 - 120
Vinyl acetate	100	112		ug/L		112	67 - 135
Vinyl chloride	50.0	58.5		ug/L		117	71 - 128
Xylenes, Total	100	103		ug/L		103	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*

Lab Sample ID: LCSD 680-564057/5
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	240		ug/L		96	70 - 135	4	30
Benzene	50.0	50.1		ug/L		100	80 - 120	3	20
Bromobenzene	50.0	51.1		ug/L		102	80 - 121	0	20
Bromochloromethane	50.0	48.0		ug/L		96	80 - 120	4	20
Bromodichloromethane	50.0	49.4		ug/L		99	80 - 120	4	20
Bromoform	50.0	51.1		ug/L		102	74 - 126	2	20
Bromomethane	50.0	73.1	*	ug/L		146	62 - 130	0	20
2-Butanone	250	249		ug/L		99	80 - 131	1	20
Carbon disulfide	50.0	48.5		ug/L		97	80 - 120	2	20
Carbon tetrachloride	50.0	51.1		ug/L		102	76 - 123	2	20
Chlorobenzene	50.0	50.4		ug/L		101	80 - 120	2	20
Chloroethane	50.0	58.0		ug/L		116	66 - 135	2	20
2-Chloroethyl vinyl ether	50.0	46.3		ug/L		93	71 - 135	4	50
Chloroform	50.0	48.5		ug/L		97	80 - 120	2	20
Chloromethane	50.0	55.2		ug/L		110	69 - 131	3	30
2-Chlorotoluene	50.0	50.4		ug/L		101	80 - 120	1	20
4-Chlorotoluene	50.0	50.7		ug/L		101	80 - 120	1	20
cis-1,2-Dichloroethene	50.0	51.6		ug/L		103	80 - 120	2	20
cis-1,3-Dichloropropene	50.0	50.8		ug/L		102	80 - 120	2	20
Dibromochloromethane	50.0	50.2		ug/L		100	80 - 121	4	20
1,2-Dibromo-3-Chloropropane	50.0	52.4		ug/L		105	71 - 134	1	20
1,2-Dibromoethane	50.0	47.5		ug/L		95	80 - 120	3	20
Dibromomethane	50.0	48.5		ug/L		97	80 - 120	4	20
1,2-Dichlorobenzene	50.0	48.5		ug/L		97	80 - 120	2	20
1,3-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120	1	20
1,4-Dichlorobenzene	50.0	49.1		ug/L		98	80 - 120	2	20
Dichlorodifluoromethane	50.0	43.6		ug/L		87	47 - 155	4	40
1,1-Dichloroethane	50.0	51.0		ug/L		102	80 - 120	2	20
1,2-Dichloroethane	50.0	44.3		ug/L		89	80 - 120	3	50
1,1-Dichloroethene	50.0	56.6		ug/L		113	76 - 120	2	20
1,2-Dichloroethene, Total	100	103		ug/L		103	80 - 120	2	20
1,2-Dichloropropane	50.0	51.5		ug/L		103	80 - 120	3	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564057/5
Matrix: Water
Analysis Batch: 564057

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3-Dichloropropane			50.0	47.6		ug/L		95	80 - 120	4	20
2,2-Dichloropropane			50.0	54.8		ug/L		110	76 - 126	3	20
1,1-Dichloropropene			50.0	49.5		ug/L		99	80 - 120	3	20
Ethylbenzene			50.0	51.0		ug/L		102	80 - 120	2	20
Hexachlorobutadiene			50.0	53.4		ug/L		107	60 - 140	1	20
2-Hexanone			250	230		ug/L		92	74 - 127	4	20
Isopropylbenzene			50.0	52.2		ug/L		104	80 - 120	0	20
Methylene Chloride			50.0	48.1		ug/L		96	80 - 120	3	20
4-Methyl-2-pentanone			250	232		ug/L		93	76 - 124	4	20
Methyl tert-butyl ether			50.0	46.7		ug/L		93	80 - 120	3	20
m-Xylene & p-Xylene			50.0	51.2		ug/L		102	80 - 120	0	20
n-Butylbenzene			50.0	51.5		ug/L		103	80 - 120	0	20
N-Propylbenzene			50.0	51.6		ug/L		103	80 - 120	1	20
o-Xylene			50.0	51.1		ug/L		102	80 - 120	1	30
p-Isopropyltoluene			50.0	52.1		ug/L		104	80 - 120	0	20
sec-Butylbenzene			50.0	51.8		ug/L		104	80 - 120	0	20
Styrene			50.0	51.5		ug/L		103	80 - 120	0	20
tert-Butylbenzene			50.0	51.7		ug/L		103	80 - 121	1	20
1,1,1,2-Tetrachloroethane			50.0	50.3		ug/L		101	80 - 121	0	20
1,1,2,2-Tetrachloroethane			50.0	49.2		ug/L		98	80 - 120	2	20
Tetrachloroethene			50.0	52.6		ug/L		105	80 - 121	2	20
Toluene			50.0	50.5		ug/L		101	80 - 113	2	20
trans-1,2-Dichloroethene			50.0	51.8		ug/L		104	80 - 120	1	20
trans-1,3-Dichloropropene			50.0	46.3		ug/L		93	80 - 120	5	30
1,2,3-Trichlorobenzene			50.0	49.9		ug/L		100	61 - 141	1	20
1,2,4-Trichlorobenzene			50.0	50.0		ug/L		100	68 - 128	2	20
1,1,1-Trichloroethane			50.0	50.6		ug/L		101	80 - 120	0	20
1,1,2-Trichloroethane			50.0	49.3		ug/L		99	80 - 120	4	20
Trichloroethene			50.0	50.3		ug/L		101	80 - 120	1	20
Trichlorofluoromethane			50.0	54.3		ug/L		109	60 - 141	3	20
1,2,3-Trichloropropane			50.0	49.0		ug/L		98	80 - 123	3	30
1,2,4-Trimethylbenzene			50.0	52.4		ug/L		105	80 - 120	0	20
1,3,5-Trimethylbenzene			50.0	51.4		ug/L		103	80 - 120	1	20
Vinyl acetate			100	108		ug/L		108	67 - 135	4	20
Vinyl chloride			50.0	57.2		ug/L		114	71 - 128	2	20
Xylenes, Total			100	102		ug/L		102	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564241/8
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/29/19 11:07	1
Benzene	<1.0		1.0	0.43	ug/L			03/29/19 11:07	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/29/19 11:07	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/29/19 11:07	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/29/19 11:07	1
Bromoform	<1.0		1.0	0.43	ug/L			03/29/19 11:07	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
2-Butanone	<10		10	3.4	ug/L			03/29/19 11:07	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/29/19 11:07	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/29/19 11:07	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/29/19 11:07	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/29/19 11:07	1
Chloroform	<1.0		1.0	0.50	ug/L			03/29/19 11:07	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/29/19 11:07	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/29/19 11:07	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/29/19 11:07	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/29/19 11:07	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/29/19 11:07	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/29/19 11:07	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/29/19 11:07	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/29/19 11:07	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/29/19 11:07	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/29/19 11:07	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/29/19 11:07	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/29/19 11:07	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/29/19 11:07	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/29/19 11:07	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/29/19 11:07	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/29/19 11:07	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/29/19 11:07	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/29/19 11:07	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/29/19 11:07	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/29/19 11:07	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/29/19 11:07	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/29/19 11:07	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
2-Hexanone	<10		10	2.0	ug/L			03/29/19 11:07	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/29/19 11:07	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/29/19 11:07	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/29/19 11:07	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/29/19 11:07	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/29/19 11:07	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/29/19 11:07	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/29/19 11:07	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/29/19 11:07	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/29/19 11:07	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564241/8
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			03/29/19 11:07	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/29/19 11:07	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/29/19 11:07	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/29/19 11:07	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/29/19 11:07	1
Toluene	<1.0		1.0	0.48	ug/L			03/29/19 11:07	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/29/19 11:07	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/29/19 11:07	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/29/19 11:07	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/29/19 11:07	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/29/19 11:07	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/29/19 11:07	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/29/19 11:07	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/29/19 11:07	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/29/19 11:07	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/29/19 11:07	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/29/19 11:07	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/29/19 11:07	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/29/19 11:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/29/19 11:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*03/29/19 11:07*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/29/19 11:07*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/29/19 11:07*	*1*

Lab Sample ID: LCS 680-564241/4
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	251		ug/L		100	70 - 135
Benzene	50.0	50.0		ug/L		100	80 - 120
Bromobenzene	50.0	51.8		ug/L		104	80 - 121
Bromochloromethane	50.0	48.8		ug/L		98	80 - 120
Bromodichloromethane	50.0	49.9		ug/L		100	80 - 120
Bromoform	50.0	52.7		ug/L		105	74 - 126
Bromomethane	50.0	63.1		ug/L		126	62 - 130
2-Butanone	250	254		ug/L		102	80 - 131
Carbon disulfide	50.0	48.7		ug/L		97	80 - 120
Carbon tetrachloride	50.0	50.9		ug/L		102	76 - 123
Chlorobenzene	50.0	51.4		ug/L		103	80 - 120
Chloroethane	50.0	56.4		ug/L		113	66 - 135
2-Chloroethyl vinyl ether	50.0	47.6		ug/L		95	71 - 135
Chloroform	50.0	48.4		ug/L		97	80 - 120
Chloromethane	50.0	52.8		ug/L		106	69 - 131
2-Chlorotoluene	50.0	50.9		ug/L		102	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564241/4
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	51.0		ug/L		102	80 - 120
cis-1,2-Dichloroethene	50.0	51.7		ug/L		103	80 - 120
cis-1,3-Dichloropropene	50.0	51.1		ug/L		102	80 - 120
Dibromochloromethane	50.0	51.3		ug/L		103	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	53.6		ug/L		107	71 - 134
1,2-Dibromoethane	50.0	48.4		ug/L		97	80 - 120
Dibromomethane	50.0	49.9		ug/L		100	80 - 120
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
1,3-Dichlorobenzene	50.0	49.5		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120
Dichlorodifluoromethane	50.0	41.1		ug/L		82	47 - 155
1,1-Dichloroethane	50.0	50.8		ug/L		102	80 - 120
1,2-Dichloroethane	50.0	44.5		ug/L		89	80 - 120
1,1-Dichloroethene	50.0	55.4		ug/L		111	76 - 120
1,2-Dichloroethene, Total	100	103		ug/L		103	80 - 120
1,2-Dichloropropane	50.0	52.3		ug/L		105	80 - 120
1,3-Dichloropropane	50.0	48.8		ug/L		98	80 - 120
2,2-Dichloropropane	50.0	54.7		ug/L		109	76 - 126
1,1-Dichloropropene	50.0	49.3		ug/L		99	80 - 120
Ethylbenzene	50.0	51.8		ug/L		104	80 - 120
Hexachlorobutadiene	50.0	54.5		ug/L		109	60 - 140
2-Hexanone	250	242		ug/L		97	74 - 127
Isopropylbenzene	50.0	53.0		ug/L		106	80 - 120
Methylene Chloride	50.0	48.6		ug/L		97	80 - 120
4-Methyl-2-pentanone	250	239		ug/L		95	76 - 124
Methyl tert-butyl ether	50.0	47.4		ug/L		95	80 - 120
m-Xylene & p-Xylene	50.0	51.2		ug/L		102	80 - 120
n-Butylbenzene	50.0	51.3		ug/L		103	80 - 120
N-Propylbenzene	50.0	52.2		ug/L		104	80 - 120
o-Xylene	50.0	51.4		ug/L		103	80 - 120
p-Isopropyltoluene	50.0	52.2		ug/L		104	80 - 120
sec-Butylbenzene	50.0	52.0		ug/L		104	80 - 120
Styrene	50.0	51.8		ug/L		104	80 - 120
tert-Butylbenzene	50.0	52.2		ug/L		104	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.4		ug/L		103	80 - 121
1,1,2,2-Tetrachloroethane	50.0	51.0		ug/L		102	80 - 120
Tetrachloroethene	50.0	52.3		ug/L		105	80 - 121
Toluene	50.0	50.4		ug/L		101	80 - 113
trans-1,2-Dichloroethene	50.0	51.7		ug/L		103	80 - 120
trans-1,3-Dichloropropene	50.0	47.4		ug/L		95	80 - 120
1,2,3-Trichlorobenzene	50.0	50.8		ug/L		102	61 - 141
1,2,4-Trichlorobenzene	50.0	52.2		ug/L		104	68 - 128
1,1,1-Trichloroethane	50.0	49.0		ug/L		98	80 - 120
1,1,2-Trichloroethane	50.0	50.2		ug/L		100	80 - 120
Trichloroethene	50.0	50.1		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	53.3		ug/L		107	60 - 141
1,2,3-Trichloropropane	50.0	50.8		ug/L		102	80 - 123
1,2,4-Trimethylbenzene	50.0	52.8		ug/L		106	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564241/4
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,3,5-Trimethylbenzene			50.0	52.4		ug/L		105	80 - 120		
Vinyl acetate			100	112		ug/L		112	67 - 135		
Vinyl chloride			50.0	55.2		ug/L		110	71 - 128		
Xylenes, Total			100	103		ug/L		103	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 680-564241/5
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	248		ug/L		99	70 - 135	1	30
Benzene			50.0	50.2		ug/L		100	80 - 120	0	20
Bromobenzene			50.0	51.2		ug/L		102	80 - 121	1	20
Bromochloromethane			50.0	48.3		ug/L		97	80 - 120	1	20
Bromodichloromethane			50.0	50.1		ug/L		100	80 - 120	0	20
Bromoform			50.0	51.2		ug/L		102	74 - 126	3	20
Bromomethane			50.0	64.7		ug/L		129	62 - 130	3	20
2-Butanone			250	250		ug/L		100	80 - 131	2	20
Carbon disulfide			50.0	49.8		ug/L		100	80 - 120	2	20
Carbon tetrachloride			50.0	51.3		ug/L		103	76 - 123	1	20
Chlorobenzene			50.0	51.6		ug/L		103	80 - 120	0	20
Chloroethane			50.0	57.0		ug/L		114	66 - 135	1	20
2-Chloroethyl vinyl ether			50.0	47.1		ug/L		94	71 - 135	1	50
Chloroform			50.0	48.0		ug/L		96	80 - 120	1	20
Chloromethane			50.0	53.0		ug/L		106	69 - 131	0	30
2-Chlorotoluene			50.0	51.7		ug/L		103	80 - 120	2	20
4-Chlorotoluene			50.0	51.1		ug/L		102	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	51.6		ug/L		103	80 - 120	0	20
cis-1,3-Dichloropropene			50.0	50.6		ug/L		101	80 - 120	1	20
Dibromochloromethane			50.0	50.2		ug/L		100	80 - 121	2	20
1,2-Dibromo-3-Chloropropane			50.0	53.3		ug/L		107	71 - 134	0	20
1,2-Dibromoethane			50.0	47.2		ug/L		94	80 - 120	3	20
Dibromomethane			50.0	49.2		ug/L		98	80 - 120	1	20
1,2-Dichlorobenzene			50.0	48.8		ug/L		98	80 - 120	0	20
1,3-Dichlorobenzene			50.0	49.9		ug/L		100	80 - 120	1	20
1,4-Dichlorobenzene			50.0	49.9		ug/L		100	80 - 120	0	20
Dichlorodifluoromethane			50.0	41.9		ug/L		84	47 - 155	2	40
1,1-Dichloroethane			50.0	51.3		ug/L		103	80 - 120	1	20
1,2-Dichloroethane			50.0	43.9		ug/L		88	80 - 120	1	50
1,1-Dichloroethene			50.0	56.2		ug/L		112	76 - 120	1	20
1,2-Dichloroethene, Total			100	104		ug/L		104	80 - 120	0	20
1,2-Dichloropropane			50.0	51.8		ug/L		104	80 - 120	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564241/5
Matrix: Water
Analysis Batch: 564241

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3-Dichloropropane			50.0	47.5		ug/L		95	80 - 120	3	20
2,2-Dichloropropane			50.0	54.8		ug/L		110	76 - 126	0	20
1,1-Dichloropropene			50.0	49.8		ug/L		100	80 - 120	1	20
Ethylbenzene			50.0	51.7		ug/L		103	80 - 120	0	20
Hexachlorobutadiene			50.0	56.1		ug/L		112	60 - 140	3	20
2-Hexanone			250	233		ug/L		93	74 - 127	3	20
Isopropylbenzene			50.0	53.4		ug/L		107	80 - 120	1	20
Methylene Chloride			50.0	48.4		ug/L		97	80 - 120	0	20
4-Methyl-2-pentanone			250	234		ug/L		94	76 - 124	2	20
Methyl tert-butyl ether			50.0	46.8		ug/L		94	80 - 120	1	20
m-Xylene & p-Xylene			50.0	51.6		ug/L		103	80 - 120	1	20
n-Butylbenzene			50.0	52.6		ug/L		105	80 - 120	3	20
N-Propylbenzene			50.0	52.0		ug/L		104	80 - 120	0	20
o-Xylene			50.0	51.5		ug/L		103	80 - 120	0	30
p-Isopropyltoluene			50.0	53.3		ug/L		107	80 - 120	2	20
sec-Butylbenzene			50.0	52.3		ug/L		105	80 - 120	1	20
Styrene			50.0	51.5		ug/L		103	80 - 120	1	20
tert-Butylbenzene			50.0	52.3		ug/L		105	80 - 121	0	20
1,1,1,2-Tetrachloroethane			50.0	50.9		ug/L		102	80 - 121	1	20
1,1,2,2-Tetrachloroethane			50.0	49.7		ug/L		99	80 - 120	3	20
Tetrachloroethene			50.0	53.1		ug/L		106	80 - 121	2	20
Toluene			50.0	50.6		ug/L		101	80 - 113	0	20
trans-1,2-Dichloroethene			50.0	52.0		ug/L		104	80 - 120	1	20
trans-1,3-Dichloropropene			50.0	46.8		ug/L		94	80 - 120	1	30
1,2,3-Trichlorobenzene			50.0	51.1		ug/L		102	61 - 141	0	20
1,2,4-Trichlorobenzene			50.0	51.7		ug/L		103	68 - 128	1	20
1,1,1-Trichloroethane			50.0	49.9		ug/L		100	80 - 120	2	20
1,1,2-Trichloroethane			50.0	48.9		ug/L		98	80 - 120	3	20
Trichloroethene			50.0	50.5		ug/L		101	80 - 120	1	20
Trichlorofluoromethane			50.0	54.6		ug/L		109	60 - 141	2	20
1,2,3-Trichloropropane			50.0	49.9		ug/L		100	80 - 123	2	30
1,2,4-Trimethylbenzene			50.0	52.5		ug/L		105	80 - 120	1	20
1,3,5-Trimethylbenzene			50.0	52.3		ug/L		105	80 - 120	0	20
Vinyl acetate			100	108		ug/L		108	67 - 135	3	20
Vinyl chloride			50.0	55.8		ug/L		112	71 - 128	1	20
Xylenes, Total			100	103		ug/L		103	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 460-597718/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 597822 — **Prep Batch: 597718**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/25/19 10:14	03/25/19 20:35	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/25/19 20:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*97*		*38 - 125*	*03/25/19 10:14*	*03/25/19 20:35*	*1*
Terphenyl-d14	*86*		*70 - 130*	*03/25/19 10:14*	*03/25/19 20:35*	*1*

Lab Sample ID: LCS 460-597718/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 597889 — **Prep Batch: 597718**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	0.800	0.399	J	ug/L		50	10 - 137
Naphthalene	0.800	0.596		ug/L		75	24 - 124

Lab Sample ID: LCSD 460-597718/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 597889 — **Prep Batch: 597718**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	0.800	0.401		ug/L		50	10 - 137	1	30
Naphthalene	0.800	0.484		ug/L		60	24 - 124	21	30

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-564915/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 564915

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/03/19 09:47	1

Lab Sample ID: LCS 680-564915/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 564915

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	10.8		mg/L		108	90 - 110

Lab Sample ID: LCSD 680-564915/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 564915

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	10.8		mg/L		108	90 - 110	0	15

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 550-173416/4
Matrix: Water
Analysis Batch: 173416

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			03/28/19 23:10	1

Lab Sample ID: LCS 550-173416/6
Matrix: Water
Analysis Batch: 173416

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	26.8		ug/L		107	85 - 115

Lab Sample ID: LCSD 550-173416/9
Matrix: Water
Analysis Batch: 173416

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	25.0	28.3		ug/L		113	85 - 115	5	15

Lab Sample ID: MB 550-173862/4
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/01/19 19:28	1

Lab Sample ID: LCS 550-173862/6
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	22.2		ug/L		89	85 - 115

Lab Sample ID: LCSD 550-173862/10
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	25.0	22.8		ug/L		91	85 - 115	2	15

Lab Sample ID: 680-166219-1 MS
Matrix: Water
Analysis Batch: 173862

Client Sample ID: GM-1B (031919)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	62		250	320		ug/L		103	80 - 120

Lab Sample ID: 680-166219-1 MSD
Matrix: Water
Analysis Batch: 173862

Client Sample ID: GM-1B (031919)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	62		250	317		ug/L		102	80 - 120	1	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-564108/1-A
Matrix: Water
Analysis Batch: 564384

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564108

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/28/19 10:39	03/30/19 01:57	1

Lab Sample ID: LCS 680-564108/2-A
Matrix: Water
Analysis Batch: 564384

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564108

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron	5000	5040		ug/L		101	80 - 120

Method: 5310 B-2011 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-564853/2
Matrix: Water
Analysis Batch: 564853

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/03/19 02:17	1

Lab Sample ID: LCS 680-564853/3
Matrix: Water
Analysis Batch: 564853

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	22.0		mg/L		110	80 - 120

Lab Sample ID: LCSD 680-564853/4
Matrix: Water
Analysis Batch: 564853

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	22.0		mg/L		110	80 - 120	0	25

GC/MS VOA

Analysis Batch: 564054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-8	TB01 (031919)	Total/NA	Water	8260B	
MB 680-564054/8	Method Blank	Total/NA	Water	8260B	
LCS 680-564054/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564054/4	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564057

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	8260B	
680-166219-2	GM-4B (031919)	Total/NA	Water	8260B	
680-166219-3	GM-14M (031919)	Total/NA	Water	8260B	
680-166219-4	GM-14S (031919)	Total/NA	Water	8260B	
680-166219-5	GM-15M (031919)	Total/NA	Water	8260B	
680-166219-6	GM-24 (031919)	Total/NA	Water	8260B	
680-166219-7	DUP01 (031919)	Total/NA	Water	8260B	
MB 680-564057/8	Method Blank	Total/NA	Water	8260B	
LCS 680-564057/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564057/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564241

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-3 - DL	GM-14M (031919)	Total/NA	Water	8260B	
MB 680-564241/8	Method Blank	Total/NA	Water	8260B	
LCS 680-564241/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564241/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 597718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	3510C	
680-166219-2	GM-4B (031919)	Total/NA	Water	3510C	
680-166219-3	GM-14M (031919)	Total/NA	Water	3510C	
680-166219-4	GM-14S (031919)	Total/NA	Water	3510C	
680-166219-6	GM-24 (031919)	Total/NA	Water	3510C	
MB 460-597718/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-597718/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-597718/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 597822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	8270D SIM	597718
680-166219-2	GM-4B (031919)	Total/NA	Water	8270D SIM	597718
680-166219-3	GM-14M (031919)	Total/NA	Water	8270D SIM	597718
680-166219-4	GM-14S (031919)	Total/NA	Water	8270D SIM	597718
680-166219-6	GM-24 (031919)	Total/NA	Water	8270D SIM	597718
MB 460-597718/1-A	Method Blank	Total/NA	Water	8270D SIM	597718

Analysis Batch: 597889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 460-597718/2-A	Lab Control Sample	Total/NA	Water	8270D SIM	597718

GC/MS Semi VOA (Continued)

Analysis Batch: 597889 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 460-597718/3-A	Lab Control Sample Dup	Total/NA	Water	8270D SIM	597718

HPLC/IC

Analysis Batch: 173416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-2	GM-4B (031919)	Total/NA	Water	314.0	
680-166219-4	GM-14S (031919)	Total/NA	Water	314.0	
680-166219-5	GM-15M (031919)	Total/NA	Water	314.0	
680-166219-7	DUP01 (031919)	Total/NA	Water	314.0	
MB 550-173416/4	Method Blank	Total/NA	Water	314.0	
LCS 550-173416/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-173416/9	Lab Control Sample Dup	Total/NA	Water	314.0	

Analysis Batch: 173862

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	314.0	
680-166219-3	GM-14M (031919)	Total/NA	Water	314.0	
680-166219-6	GM-24 (031919)	Total/NA	Water	314.0	
MB 550-173862/4	Method Blank	Total/NA	Water	314.0	
LCS 550-173862/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-173862/10	Lab Control Sample Dup	Total/NA	Water	314.0	
680-166219-1 MS	GM-1B (031919)	Total/NA	Water	314.0	
680-166219-1 MSD	GM-1B (031919)	Total/NA	Water	314.0	

Analysis Batch: 564915

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	300.0-1993 R2.1	
680-166219-3	GM-14M (031919)	Total/NA	Water	300.0-1993 R2.1	
MB 680-564915/2	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-564915/3	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-564915/4	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Prep Batch: 564108

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Dissolved	Water	3005A	
680-166219-3	GM-14M (031919)	Dissolved	Water	3005A	
MB 680-564108/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564108/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 564384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Dissolved	Water	6010C	564108
680-166219-3	GM-14M (031919)	Dissolved	Water	6010C	564108
MB 680-564108/1-A	Method Blank	Total Recoverable	Water	6010C	564108
LCS 680-564108/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564108

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

General Chemistry

Analysis Batch: 564853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166219-1	GM-1B (031919)	Total/NA	Water	5310 B-2011	
680-166219-3	GM-14M (031919)	Total/NA	Water	5310 B-2011	
MB 680-564853/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-564853/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-564853/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919)

Lab Sample ID: 680-166219-1

Date Collected: 03/19/19 15:30

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 16:35	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	597718	03/25/19 10:14	DXD	TAL EDI
Total/NA	Analysis	8270D SIM		1			597822	03/26/19 03:29	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	564915	04/03/19 13:29	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		10			173862	04/01/19 20:36	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564108	03/28/19 10:39	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564384	03/30/19 03:12	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	564853	04/03/19 07:32	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-4B (031919)

Lab Sample ID: 680-166219-2

Date Collected: 03/19/19 13:50

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 17:01	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	597718	03/25/19 10:14	DXD	TAL EDI
Total/NA	Analysis	8270D SIM		1			597822	03/26/19 03:50	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			173416	03/29/19 04:08	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-14M (031919)

Lab Sample ID: 680-166219-3

Date Collected: 03/19/19 10:55

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 17:26	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	8260B	DL	2	5 mL	5 mL	564241	03/29/19 13:16	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	597718	03/25/19 10:14	DXD	TAL EDI
Total/NA	Analysis	8270D SIM		1			597822	03/26/19 04:12	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	564915	04/03/19 13:42	SMP	TAL SAV
	Instrument ID: CICK									

Client Sample ID: GM-14M (031919)

Lab Sample ID: 680-166219-3

Date Collected: 03/19/19 10:55

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	314.0		10			173862	04/01/19 22:08	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564108	03/28/19 10:39	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564384	03/30/19 03:08	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	564853	04/03/19 07:52	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-14S (031919)

Lab Sample ID: 680-166219-4

Date Collected: 03/19/19 10:55

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 17:52	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	597718	03/25/19 10:14	DXD	TAL EDI
Total/NA	Analysis	8270D SIM		1			597822	03/26/19 04:33	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			173416	03/29/19 04:54	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-15M (031919)

Lab Sample ID: 680-166219-5

Date Collected: 03/19/19 13:55

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 18:18	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		1			173416	03/29/19 05:17	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-24 (031919)

Lab Sample ID: 680-166219-6

Date Collected: 03/19/19 16:20

Matrix: Water

Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 14:52	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	597718	03/25/19 10:14	DXD	TAL EDI
Total/NA	Analysis	8270D SIM		1			597822	03/26/19 04:55	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		10			173862	04/01/19 22:31	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: DUP01 (031919)

Lab Sample ID: 680-166219-7

Date Collected: 03/19/19 08:00
Matrix: Water
Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564057	03/28/19 18:44	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		1			173416	03/29/19 06:02	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: TB01 (031919)

Lab Sample ID: 680-166219-8

Date Collected: 03/19/19 00:00
Matrix: Water
Date Received: 03/21/19 08:47

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564054	03/28/19 11:22	Y1S	TAL SAV
	Instrument ID: CMSA2									

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Baltimore #201

Chain of Custody Record 309991

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zembito	Date: 3/19/19	COC No:
Company Name: Arcadis Inc	Tel/Fax: 410-987-0032	Lab Contact:	Carrier:	1 of 1 COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler: F. Morrison/A. Feild
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital/Alliant Tech	☐ 1 week			
Site: Elkton, MD	☐ 2 days			Job / SDG No.:
PO# MD001006.0005	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOC	6010C - Dissolved Iron	SM5310_TOC_B	3500CHEM_28D	8270D_SIM	314.0 - Perchlorate	Sample Specific Notes:
GM-1B(031919)	3/19/19	1530		GW	11			3	1	3	1	2	1	
GM-4B(031919)	3/19/19	1350		GW	6			3				2	1	
GM-14M(031919)	3/19/19	1055		GW	11			3	1	3	1	2	1	
GM-14S(031919)	3/19/19	~~0800~~ 1055 EMM		GW	6			3				2	1	
GM-15M(031919)	3/19/19	1355		GW	4			3					1	
GM-24(031919)	3/19/19	1620		GW	6			3				2	1	
DUP01(031919)	3/19/19	0800 EMM		GW	4			3					1	
TB01(031919)	~~3/19/19 0800~~				3			3						

680-166219 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	3/20/19	Received by:	TA	3/20/19 1200
Relinquished by:	Company: 3/20/19	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TASAV	Date/Time: 3/21/19 8:47

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4/4/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-558651.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166219-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/2/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-1B (031919) (680-166219-1)	3/19/19	15:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-4B (031919) (680-166219-2)	3/19/19	13:50 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-14M (031919) (680-166219-3)	3/19/19	10:55 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-14S (031919) (680-166219-4)	3/19/19	10:55 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-24 (031919) (680-166219-6)	3/19/19	16:20 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3-21-19 1717		[signature] via FedEx	3/22/19 0900	DAE
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☑ Yes △ No	Custody Seal No.: 700276	Cooler Temperature(s) °C and Other Remarks: 4.2°C IR9

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-558652.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166219-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/2/2019	Analysis Requested		Preservation Codes:
City: Phoenix	TAT Requested (days):			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Elkton	Project #: 68012765			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-1B (031919) (680-166219-1)	3/19/19	15:30 Eastern		Water			X	1	
GM-4B (031919) (680-166219-2)	3/19/19	13:50 Eastern		Water			X	1	
GM-14M (031919) (680-166219-3)	3/19/19	10:55 Eastern		Water			X	1	
GM-14S (031919) (680-166219-4)	3/19/19	10:55 Eastern		Water			X	1	
GM-15M (031919) (680-166219-5)	3/19/19	13:55 Eastern		Water			X	1	
GM-24 (031919) (680-166219-6)	3/19/19	16:20 Eastern		Water			X	1	
DUP01 (031919) (680-166219-7)	3/19/19	08:00 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3-21-19 1727				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 3-22-19 0900	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: (3.1°C) FED

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166219-1

Login Number: 166219

List Source: TestAmerica Savannah

List Number: 1

Creator: Weston, Pamela

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166219-1

Login Number: 166219
List Number: 2
Creator: Armbruster, Chris

List Source: TestAmerica Edison
List Creation: 03/22/19 12:32 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	700276
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.2°C IR9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166219-1

Login Number: 166219
List Number: 3
Creator: Maycock, Lisa

List Source: TestAmerica Phoenix
List Creation: 03/22/19 01:54 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Laboratory: TestAmerica Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	250	12-31-19

Laboratory: TestAmerica Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-19
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

Laboratory: TestAmerica Phoenix

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP		154268	07-01-19
AIHA-LAP, LLC	IHLAP		154268	07-01-19
Arizona	State Program	9	AZ0728	06-09-19
California	LA Cty Sanitation Districts	9	9254471	04-10-19 *
California	State Program	9	2941	03-09-19 *
Nevada	State Program	9	AZ01030	07-31-19
Oregon	NELAP	10	AZ100001	03-09-20
USDA	Federal		P330-16-00302	08-27-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-166366-1
Client Project/Site: ATK Orbital Elkton

For:
ARCADIS U.S., Inc.
7550 Teague Road
Suite 210
Hanover, Maryland 21076

Attn: Ms. Tina Armstrong

Authorized for release by:
4/8/2019 5:31:48 PM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 680-166366-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: ATK Orbital Elkton

Report Number: 680-166366-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 03/23/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5º C and 1.8º C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples GM-9M (032019) (680-166366-1), GM-10S (032019) (680-166366-2), MW-1 (032019) (680-166366-3), MW-2 (032019) (680-166366-4), MW-10 (032019) (680-166366-5), MW-12 (032019) (680-166366-6), MW-13 (032019) (680-166366-7), MW-20 (032019) (680-166366-8), MW-22 (032019) (680-166366-9), DUP-02 (032019) (680-166366-10), GM-27 (032119) (680-166366-11), TB-02 (680-166366-12) and EB-01 (032119) (680-166366-13) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/30/2019, 04/01/2019, 04/02/2019 and 04/04/2019.

Reanalysis of the following sample(s) was performed outside of the analytical holding time due to the original analysis being over dilute. Both sets of data have been reported.: MW-2 (032019) (680-166366-4).

The method blank for analytical batch 680-564619 contained cis-1,2-Dichloroethene above the method detection limit (MDL). Associated samples were not re-analyzed because results were less than the 1/2RL.

The laboratory control sample (LCS) for analytical batch 680-564389 recovered outside control limits for the following analyte: Bromomethane. ThIS analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-564521 recovered outside control limits for the following analytes: Bromomethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample duplicate (LCSD) for analytical batch 680-564517 recovered outside control limits for the following analytes: sec-Butylbenzene. ThIS analyte was biased high in the LCSD and was not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-564619 recovered outside control limits for the following analytes: Dibromochloromethane and 1,1-Dichloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-565029 recovered outside control limits for the following analytes: Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Job ID: 680-166366-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Samples MW-2 (032019) (680-166366-4)[20X] and MW-13 (032019) (680-166366-7)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-564389, 680-564388, 680-564521, 680-564517, and 680-564619.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (AQUEOUS)

Sample EB-01 (032119) (680-166366-13) was analyzed for Semivolatile Organic Compounds (Aqueous) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 03/28/2019 and analyzed on 03/29/2019.

Six surrogates are used for this analysis. The laboratory's SOP allows one acid and one base of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: EB-01 (032119) (680-166366-13). These results have been reported and qualified.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS BY GCMS - LOW LEVEL

Samples GM-9M (032019) (680-166366-1), GM-10S (032019) (680-166366-2), GM-27 (032119) (680-166366-11) and EB-01 (032119) (680-166366-13) were analyzed for Semivolatile Organic Compounds by GCMS - Low Level in accordance with EPA SW-846 Method 8270D. The samples were prepared on 03/26/2019 and analyzed on 03/27/2019.

Two surrogates are used for this analysis. The laboratory's SOP allows one of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: GM-9M (032019) (680-166366-1). These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCHLORATE (IC)

Samples GM-9M (032019) (680-166366-1), GM-10S (032019) (680-166366-2), MW-1 (032019) (680-166366-3), MW-2 (032019) (680-166366-4), MW-10 (032019) (680-166366-5), MW-12 (032019) (680-166366-6), MW-13 (032019) (680-166366-7), MW-20 (032019) (680-166366-8), MW-22 (032019) (680-166366-9), DUP-02 (032019) (680-166366-10), GM-27 (032119) (680-166366-11) and EB-01 (032119) (680-166366-13) were analyzed for perchlorate (IC) in accordance with EPA Method 314.0. The samples were analyzed on 04/02/2019 and 04/03/2019.

Samples GM-9M (032019) (680-166366-1)[100X], MW-1 (032019) (680-166366-3)[100X], MW-2 (032019) (680-166366-4)[200X], MW-12 (032019) (680-166366-6)[100X], MW-13 (032019) (680-166366-7)[100X], MW-20 (032019) (680-166366-8)[100X] and DUP-02 (032019) (680-166366-10)[200X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP) - DISSOLVED

Samples GM-10S (032019) (680-166366-2), MW-2 (032019) (680-166366-4), MW-12 (032019) (680-166366-6), MW-22 (032019) (680-166366-9), DUP-02 (032019) (680-166366-10) and EB-01 (032119) (680-166366-13) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 03/31/2019 and 04/01/2019 and analyzed on 04/01/2019 and 04/04/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)

Sample EB-01 (032119) (680-166366-13) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples

Job ID: 680-166366-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

were prepared on 04/01/2019 and analyzed on 04/04/2019.

Copper was detected in method blank MB 680-564584/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Sample EB-01 (032119) (680-166366-13) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 04/03/2019 and analyzed on 04/08/2019.

The continuing calibration verification (CCV) associated with batch 680-565503 recovered above the upper control limit for mercury. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples GM-10S (032019) (680-166366-2), MW-2 (032019) (680-166366-4), MW-12 (032019) (680-166366-6), MW-22 (032019) (680-166366-9), DUP-02 (032019) (680-166366-10) and EB-01 (032119) (680-166366-13) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 04/05/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL KJELDAHL NITROGEN (TKN)

Samples MW-20 (032019) (680-166366-8), MW-22 (032019) (680-166366-9) and EB-01 (032119) (680-166366-13) were analyzed for total kjeldahl nitrogen (TKN) in accordance with EPA Method 351.2. The samples were prepared on 04/02/2019 and analyzed on 04/03/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

NITRATE-NITRITE AS NITROGEN

Samples MW-20 (032019) (680-166366-8), MW-22 (032019) (680-166366-9) and EB-01 (032119) (680-166366-13) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 03/27/2019 and 04/06/2019.

Sample MW-20 (032019) (680-166366-8)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples GM-10S (032019) (680-166366-2), MW-2 (032019) (680-166366-4), MW-12 (032019) (680-166366-6), MW-22 (032019) (680-166366-9), DUP-02 (032019) (680-166366-10) and EB-01 (032119) (680-166366-13) were analyzed for total organic carbon in accordance with SM 5310B. The samples were analyzed on 04/05/2019 and 04/06/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-166366-1	GM-9M (032019)	Water	03/20/19 09:40	03/23/19 10:15
680-166366-2	GM-10S (032019)	Water	03/20/19 09:45	03/23/19 10:15
680-166366-3	MW-1 (032019)	Water	03/20/19 12:00	03/23/19 10:15
680-166366-4	MW-2 (032019)	Water	03/20/19 13:20	03/23/19 10:15
680-166366-5	MW-10 (032019)	Water	03/20/19 15:45	03/23/19 10:15
680-166366-6	MW-12 (032019)	Water	03/20/19 15:05	03/23/19 10:15
680-166366-7	MW-13 (032019)	Water	03/20/19 14:40	03/23/19 10:15
680-166366-8	MW-20 (032019)	Water	03/20/19 13:30	03/23/19 10:15
680-166366-9	MW-22 (032019)	Water	03/20/19 12:15	03/23/19 10:15
680-166366-10	DUP-02 (032019)	Water	03/20/19 12:00	03/23/19 10:15
680-166366-11	GM-27 (032119)	Water	03/21/19 11:15	03/23/19 10:15
680-166366-12	TB-02	Water	03/20/19 00:00	03/23/19 10:15
680-166366-13	EB-01 (032119)	Water	03/21/19 12:00	03/23/19 10:15

Method Summary

Client: ARCADIS U.S., Inc.
Job ID: 680-166366-1
Project/Site: ATK Orbital Elkton

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL EDI
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
314.0	Perchlorate (IC)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL SAV
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
5310 B-2011	Organic Carbon, Total (TOC)	SM	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL EDI
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV
Digestion	Digestion, Hot Block	MCAWW	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Job ID: 680-166366-1
Project/Site: ATK Orbital Elkton

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-9M (032019) — Lab Sample ID: 680-166366-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	0.40	J	1.0	0.33	ug/L	1		8260B	Total/NA
Chloroform	0.77	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	2.6		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	18		1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	2.6		1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	52		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	2.6		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	8.0		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	120		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	8.3		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	570		100	28	ug/L	100		314.0	Total/NA

Client Sample ID: GM-10S (032019) — Lab Sample ID: 680-166366-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	0.88	J	1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	6.3		1.0	0.36	ug/L	1		8260B	Total/NA
Trichloroethene	3.0		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	0.89		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	10		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	4.2		1.0	0.28	ug/L	1		314.0	Total/NA
Dissolved Iron	18	J	50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	0.65	J	1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-1 (032019) — Lab Sample ID: 680-166366-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.55	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	1.3		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	12		1.0	0.36	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	34		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	0.66	J	1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	240		100	28	ug/L	100		314.0	Total/NA

Client Sample ID: MW-2 (032019) — Lab Sample ID: 680-166366-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	2.9	H	1.0	0.38	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	43		20	7.4	ug/L	20		8260B	Total/NA
1,1,1-Trichloroethane	37	H	1.0	0.37	ug/L	1		8260B	Total/NA
Sulfate	8.2		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	1000		200	55	ug/L	200		314.0	Total/NA
Dissolved Iron	18	J	50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	1.1		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-10 (032019) — Lab Sample ID: 680-166366-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.81	J	1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	7.4		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	5.9		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	0.81	J	2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	0.45	J	1.0	0.37	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-10 (032019) (Continued) — Lab Sample ID: 680-166366-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	7.8		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	46		1.0	0.28	ug/L	1		314.0	Total/NA

Client Sample ID: MW-12 (032019) — Lab Sample ID: 680-166366-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	19		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	350		100	28	ug/L	100		314.0	Total/NA
Dissolved Iron	17	J	50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	1.5		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-13 (032019) — Lab Sample ID: 680-166366-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	740		10	2.6	ug/L	10		8260B	Total/NA
cis-1,2-Dichloroethene	210		10	4.1	ug/L	10		8260B	Total/NA
1,1-Dichloroethane	8.7	J	10	3.8	ug/L	10		8260B	Total/NA
1,1-Dichloroethene	8.4	J	10	3.6	ug/L	10		8260B	Total/NA
1,2-Dichloroethene, Total	210		20	3.7	ug/L	10		8260B	Total/NA
Trichloroethene	350		10	4.8	ug/L	10		8260B	Total/NA
Perchlorate	250		100	28	ug/L	100		314.0	Total/NA

Client Sample ID: MW-20 (032019) — Lab Sample ID: 680-166366-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroethane	20		5.0	2.5	ug/L	1		8260B	Total/NA
Chloroform	0.55	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	0.67	J	1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	110		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	29		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	0.67	J	2.0	0.37	ug/L	1		8260B	Total/NA
Tetrachloroethene	0.80	J	1.0	0.74	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	120		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	5.8		1.0	0.48	ug/L	1		8260B	Total/NA
Vinyl chloride	3.9		1.0	0.50	ug/L	1		8260B	Total/NA
Perchlorate	480		100	28	ug/L	100		314.0	Total/NA
Nitrogen, Kjeldahl	2.7		0.20	0.10	mg/L	1		351.2	Total/NA
Nitrate Nitrite as N	0.93		0.50	0.10	mg/L	10		353.2	Total/NA

Client Sample ID: MW-22 (032019) — Lab Sample ID: 680-166366-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.1		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	38		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	9.9		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	2.1		2.0	0.37	ug/L	1		8260B	Total/NA
Tetrachloroethene	13		1.0	0.74	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	78		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	21		1.0	0.48	ug/L	1		8260B	Total/NA
Sulfate	23		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	24		1.0	0.28	ug/L	1		314.0	Total/NA
Dissolved Iron	57		50	17	ug/L	1		6010C	Dissolved
Nitrogen, Kjeldahl	0.13	J	0.20	0.10	mg/L	1		351.2	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-22 (032019) (Continued)
Lab Sample ID: 680-166366-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate Nitrite as N	0.87		0.050	0.010	mg/L	1		353.2	Total/NA
Total Organic Carbon	0.68	J	1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: DUP-02 (032019)
Lab Sample ID: 680-166366-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	3.6		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	1.1		1.0	0.36	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	47		1.0	0.37	ug/L	1		8260B	Total/NA
Sulfate	8.2		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	960		200	55	ug/L	200		314.0	Total/NA
Total Organic Carbon	1.1		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: GM-27 (032119)
Lab Sample ID: 680-166366-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
o-Xylene	0.31	J	1.0	0.23	ug/L	1		8260B	Total/NA
1,2,4-Trimethylbenzene	1.5		1.0	0.47	ug/L	1		8260B	Total/NA
Xylenes, Total	1.5		1.0	0.23	ug/L	1		8260B	Total/NA

Client Sample ID: TB-02
Lab Sample ID: 680-166366-12

No Detections.

Client Sample ID: EB-01 (032119)
Lab Sample ID: 680-166366-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	98		10	7.0	ug/L	1		8260B	Total/NA
Trichloroethene	1.2		1.0	0.48	ug/L	1		8260B	Total/NA
Calcium	200	J	500	25	ug/L	1		6010C	Total Recoverable
Copper	6.3	J B	20	1.8	ug/L	1		6010C	Total Recoverable
Magnesium	43	J	500	33	ug/L	1		6010C	Total Recoverable
Sodium	710	J	1000	480	ug/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-9M (032019)
Date Collected: 03/20/19 09:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 16:15	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 16:15	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 16:15	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 16:15	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 16:15	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 16:15	1
Carbon tetrachloride	**0.40**	**J**	1.0	0.33	ug/L			03/30/19 16:15	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 16:15	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 16:15	1
Chloroform	**0.77**	**J**	1.0	0.50	ug/L			03/30/19 16:15	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 16:15	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 16:15	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
cis-1,2-Dichloroethene	**2.6**		1.0	0.41	ug/L			03/30/19 16:15	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 16:15	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 16:15	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 16:15	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 16:15	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 16:15	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 16:15	1
1,1-Dichloroethane	**18**		1.0	0.38	ug/L			03/30/19 16:15	1
1,2-Dichloroethane	**2.6**		1.0	0.50	ug/L			03/30/19 16:15	1
1,1-Dichloroethene	**52**		1.0	0.36	ug/L			03/30/19 16:15	1
1,2-Dichloroethene, Total	**2.6**		2.0	0.37	ug/L			03/30/19 16:15	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 16:15	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 16:15	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 16:15	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 16:15	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 16:15	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 16:15	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 16:15	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:15	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 16:15	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 16:15	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 16:15	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 16:15	1

Client Sample ID: GM-9M (032019)
Date Collected: 03/20/19 09:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 16:15	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 16:15	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 16:15	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
1,1,1-Trichloroethane	**8.0**		1.0	0.37	ug/L			03/30/19 16:15	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 16:15	1
Trichloroethene	**120**		1.0	0.48	ug/L			03/30/19 16:15	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 16:15	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:15	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 16:15	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 16:15	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 16:15	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 16:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 16:15*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 16:15*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 16:15*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**8.3**		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 16:37	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 16:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*67*		*38 - 125*	*03/26/19 11:53*	*03/27/19 16:37*	*1*
Terphenyl-d14	*62*	*X*	*70 - 130*	*03/26/19 11:53*	*03/27/19 16:37*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**570**		100	28	ug/L			04/02/19 18:53	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-10S (032019)
Date Collected: 03/20/19 09:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 16:41	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 16:41	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 16:41	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 16:41	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 16:41	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 16:41	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 16:41	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 16:41	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 16:41	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 16:41	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 16:41	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 16:41	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 16:41	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 16:41	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 16:41	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 16:41	1
1,1-Dichloroethane	**0.88**	**J**	1.0	0.38	ug/L			03/30/19 16:41	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
1,1-Dichloroethene	**6.3**		1.0	0.36	ug/L			03/30/19 16:41	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 16:41	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 16:41	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 16:41	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 16:41	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 16:41	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 16:41	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 16:41	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:41	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 16:41	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 16:41	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 16:41	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 16:41	1

Client Sample ID: GM-10S (032019)
Date Collected: 03/20/19 09:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 16:41	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 16:41	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 16:41	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Trichloroethene	**3.0**		1.0	0.48	ug/L			03/30/19 16:41	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 16:41	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:41	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 16:41	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 16:41	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 16:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 16:41*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 16:41*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 16:41*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.89**		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 16:58	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 16:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*80*		*38 - 125*	*03/26/19 11:53*	*03/27/19 16:58*	*1*
Terphenyl-d14	*81*		*70 - 130*	*03/26/19 11:53*	*03/27/19 16:58*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**10**		1.0	0.40	mg/L			04/05/19 16:38	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4.2**		1.0	0.28	ug/L			04/02/19 01:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**18**	**J**	50	17	ug/L		04/01/19 11:47	04/04/19 18:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.65**	**J**	1.0	0.50	mg/L			04/05/19 01:58	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-1 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:07	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:07	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 17:07	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:07	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:07	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:07	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 17:07	1
Chloroform	**0.55**	**J**	1.0	0.50	ug/L			03/30/19 17:07	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:07	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:07	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 17:07	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:07	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:07	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:07	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:07	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:07	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:07	1
1,1-Dichloroethane	**1.3**		1.0	0.38	ug/L			03/30/19 17:07	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
1,1-Dichloroethene	**12**		1.0	0.36	ug/L			03/30/19 17:07	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 17:07	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:07	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:07	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:07	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:07	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:07	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:07	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:07	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:07	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:07	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:07	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:07	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-1 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:07	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:07	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:07	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
1,1,1-Trichloroethane	**34**		1.0	0.37	ug/L			03/30/19 17:07	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Trichloroethene	**0.66**	**J**	1.0	0.48	ug/L			03/30/19 17:07	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:07	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:07	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:07	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:07	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 17:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/30/19 17:07*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*03/30/19 17:07*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 17:07*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**240**		100	28	ug/L			04/02/19 19:16	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<200		200	140	ug/L			03/30/19 17:45	20
Acetone	<10	H	10	7.0	ug/L			04/04/19 13:02	1
Benzene	<20		20	8.6	ug/L			03/30/19 17:45	20
Benzene	<1.0	H	1.0	0.43	ug/L			04/04/19 13:02	1
Bromobenzene	<20		20	10	ug/L			03/30/19 17:45	20
Bromobenzene	<1.0	H	1.0	0.50	ug/L			04/04/19 13:02	1
Bromochloromethane	<20		20	9.0	ug/L			03/30/19 17:45	20
Bromochloromethane	<1.0	H	1.0	0.45	ug/L			04/04/19 13:02	1
Bromodichloromethane	<20		20	8.8	ug/L			03/30/19 17:45	20
Bromodichloromethane	<1.0	H	1.0	0.44	ug/L			04/04/19 13:02	1
Bromoform	<20		20	8.6	ug/L			03/30/19 17:45	20
Bromoform	<1.0	H	1.0	0.43	ug/L			04/04/19 13:02	1
Bromomethane	<100		100	50	ug/L			03/30/19 17:45	20
Bromomethane	<5.0	H *	5.0	2.5	ug/L			04/04/19 13:02	1
2-Butanone	<200		200	68	ug/L			03/30/19 17:45	20
2-Butanone	<10	H	10	3.4	ug/L			04/04/19 13:02	1
Carbon disulfide	<40		40	20	ug/L			03/30/19 17:45	20
Carbon disulfide	<2.0	H	2.0	1.0	ug/L			04/04/19 13:02	1
Carbon tetrachloride	<20		20	6.6	ug/L			03/30/19 17:45	20
Carbon tetrachloride	<1.0	H	1.0	0.33	ug/L			04/04/19 13:02	1
Chlorobenzene	<20		20	5.2	ug/L			03/30/19 17:45	20
Chlorobenzene	<1.0	H	1.0	0.26	ug/L			04/04/19 13:02	1
Chloroethane	<100		100	50	ug/L			03/30/19 17:45	20
Chloroethane	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
2-Chloroethyl vinyl ether	<200		200	100	ug/L			03/30/19 17:45	20
2-Chloroethyl vinyl ether	<10	H	10	5.0	ug/L			04/04/19 13:02	1
Chloroform	<20		20	10	ug/L			03/30/19 17:45	20
Chloroform	<1.0	H	1.0	0.50	ug/L			04/04/19 13:02	1
Chloromethane	<20		20	8.0	ug/L			03/30/19 17:45	20
Chloromethane	<1.0	H	1.0	0.40	ug/L			04/04/19 13:02	1
2-Chlorotoluene	<20		20	5.4	ug/L			03/30/19 17:45	20
2-Chlorotoluene	<1.0	H	1.0	0.27	ug/L			04/04/19 13:02	1
4-Chlorotoluene	<20		20	9.0	ug/L			03/30/19 17:45	20
4-Chlorotoluene	<1.0	H	1.0	0.45	ug/L			04/04/19 13:02	1
cis-1,2-Dichloroethene	<20		20	8.2	ug/L			03/30/19 17:45	20
cis-1,2-Dichloroethene	<1.0	H	1.0	0.41	ug/L			04/04/19 13:02	1
cis-1,3-Dichloropropene	<20		20	8.0	ug/L			03/30/19 17:45	20
cis-1,3-Dichloropropene	<1.0	H	1.0	0.40	ug/L			04/04/19 13:02	1
Dibromochloromethane	<20		20	6.4	ug/L			03/30/19 17:45	20
Dibromochloromethane	<1.0	H	1.0	0.32	ug/L			04/04/19 13:02	1
1,2-Dibromo-3-Chloropropane	<100		100	22	ug/L			03/30/19 17:45	20
1,2-Dibromo-3-Chloropropane	<5.0	H	5.0	1.1	ug/L			04/04/19 13:02	1
1,2-Dibromoethane	<20		20	8.8	ug/L			03/30/19 17:45	20
1,2-Dibromoethane	<1.0	H	1.0	0.44	ug/L			04/04/19 13:02	1
Dibromomethane	<20		20	7.0	ug/L			03/30/19 17:45	20
Dibromomethane	<1.0	H	1.0	0.35	ug/L			04/04/19 13:02	1
1,2-Dichlorobenzene	<20		20	7.4	ug/L			03/30/19 17:45	20
1,2-Dichlorobenzene	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
1,3-Dichlorobenzene	<20		20	8.6	ug/L			03/30/19 17:45	20

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	<1.0	H	1.0	0.43	ug/L			04/04/19 13:02	1
1,4-Dichlorobenzene	<20		20	9.2	ug/L			03/30/19 17:45	20
1,4-Dichlorobenzene	<1.0	H	1.0	0.46	ug/L			04/04/19 13:02	1
Dichlorodifluoromethane	<20		20	12	ug/L			03/30/19 17:45	20
Dichlorodifluoromethane	<1.0	H	1.0	0.60	ug/L			04/04/19 13:02	1
1,1-Dichloroethane	<20		20	7.6	ug/L			03/30/19 17:45	20
1,1-Dichloroethane	**2.9**	**H**	1.0	0.38	ug/L			04/04/19 13:02	1
1,2-Dichloroethane	<20		20	10	ug/L			03/30/19 17:45	20
1,2-Dichloroethane	<1.0	H	1.0	0.50	ug/L			04/04/19 13:02	1
1,1-Dichloroethene	<20		20	7.2	ug/L			03/30/19 17:45	20
1,1-Dichloroethene	<1.0	H	1.0	0.36	ug/L			04/04/19 13:02	1
1,2-Dichloroethene, Total	<40		40	7.4	ug/L			03/30/19 17:45	20
1,2-Dichloroethene, Total	<2.0	H	2.0	0.37	ug/L			04/04/19 13:02	1
1,2-Dichloropropane	<20		20	13	ug/L			03/30/19 17:45	20
1,2-Dichloropropane	<1.0	H	1.0	0.67	ug/L			04/04/19 13:02	1
1,3-Dichloropropane	<20		20	6.8	ug/L			03/30/19 17:45	20
1,3-Dichloropropane	<1.0	H	1.0	0.34	ug/L			04/04/19 13:02	1
2,2-Dichloropropane	<20		20	7.4	ug/L			03/30/19 17:45	20
2,2-Dichloropropane	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
1,1-Dichloropropene	<20		20	6.8	ug/L			03/30/19 17:45	20
1,1-Dichloropropene	<1.0	H	1.0	0.34	ug/L			04/04/19 13:02	1
Ethylbenzene	<20		20	6.6	ug/L			03/30/19 17:45	20
Ethylbenzene	<1.0	H	1.0	0.33	ug/L			04/04/19 13:02	1
Hexachlorobutadiene	<100		100	50	ug/L			03/30/19 17:45	20
Hexachlorobutadiene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
2-Hexanone	<200		200	40	ug/L			03/30/19 17:45	20
2-Hexanone	<10	H	10	2.0	ug/L			04/04/19 13:02	1
Isopropylbenzene	<20		20	7.0	ug/L			03/30/19 17:45	20
Isopropylbenzene	<1.0	H	1.0	0.35	ug/L			04/04/19 13:02	1
Methylene Chloride	<100		100	50	ug/L			03/30/19 17:45	20
Methylene Chloride	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
4-Methyl-2-pentanone	<200		200	42	ug/L			03/30/19 17:45	20
4-Methyl-2-pentanone	<10	H	10	2.1	ug/L			04/04/19 13:02	1
Methyl tert-butyl ether	<200		200	6.0	ug/L			03/30/19 17:45	20
Methyl tert-butyl ether	<10	H	10	0.30	ug/L			04/04/19 13:02	1
m-Xylene & p-Xylene	<20		20	7.0	ug/L			03/30/19 17:45	20
m-Xylene & p-Xylene	<1.0	H	1.0	0.35	ug/L			04/04/19 13:02	1
n-Butylbenzene	<20		20	9.4	ug/L			03/30/19 17:45	20
n-Butylbenzene	<1.0	H	1.0	0.47	ug/L			04/04/19 13:02	1
N-Propylbenzene	<20		20	7.6	ug/L			03/30/19 17:45	20
N-Propylbenzene	<1.0	H	1.0	0.38	ug/L			04/04/19 13:02	1
o-Xylene	<20		20	4.6	ug/L			03/30/19 17:45	20
o-Xylene	<1.0	H	1.0	0.23	ug/L			04/04/19 13:02	1
p-Isopropyltoluene	<20		20	9.6	ug/L			03/30/19 17:45	20
p-Isopropyltoluene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
sec-Butylbenzene	<20		20	8.4	ug/L			03/30/19 17:45	20
sec-Butylbenzene	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
Styrene	<20		20	5.4	ug/L			03/30/19 17:45	20
Styrene	<1.0	H	1.0	0.27	ug/L			04/04/19 13:02	1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<20		20	9.0	ug/L			03/30/19 17:45	20
tert-Butylbenzene	<1.0	H	1.0	0.45	ug/L			04/04/19 13:02	1
1,1,1,2-Tetrachloroethane	<20		20	7.4	ug/L			03/30/19 17:45	20
1,1,1,2-Tetrachloroethane	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
1,1,2,2-Tetrachloroethane	<20		20	12	ug/L			03/30/19 17:45	20
1,1,2,2-Tetrachloroethane	<1.0	H	1.0	0.62	ug/L			04/04/19 13:02	1
Tetrachloroethene	<20		20	15	ug/L			03/30/19 17:45	20
Tetrachloroethene	<1.0	H	1.0	0.74	ug/L			04/04/19 13:02	1
Toluene	<20		20	9.6	ug/L			03/30/19 17:45	20
Toluene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
trans-1,2-Dichloroethene	<20		20	7.4	ug/L			03/30/19 17:45	20
trans-1,2-Dichloroethene	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
trans-1,3-Dichloropropene	<20		20	8.4	ug/L			03/30/19 17:45	20
trans-1,3-Dichloropropene	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
1,2,3-Trichlorobenzene	<100		100	50	ug/L			03/30/19 17:45	20
1,2,3-Trichlorobenzene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
1,2,4-Trichlorobenzene	<100		100	50	ug/L			03/30/19 17:45	20
1,2,4-Trichlorobenzene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
1,1,1-Trichloroethane	**43**		20	7.4	ug/L			03/30/19 17:45	20
1,1,1-Trichloroethane	**37**	**H**	1.0	0.37	ug/L			04/04/19 13:02	1
1,1,2-Trichloroethane	<20		20	6.6	ug/L			03/30/19 17:45	20
1,1,2-Trichloroethane	<1.0	H	1.0	0.33	ug/L			04/04/19 13:02	1
Trichloroethene	<20		20	9.6	ug/L			03/30/19 17:45	20
Trichloroethene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
Trichlorofluoromethane	<20		20	8.4	ug/L			03/30/19 17:45	20
Trichlorofluoromethane	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
1,2,3-Trichloropropane	<20		20	7.8	ug/L			03/30/19 17:45	20
1,2,3-Trichloropropane	<1.0	H	1.0	0.39	ug/L			04/04/19 13:02	1
1,2,4-Trimethylbenzene	<20		20	9.4	ug/L			03/30/19 17:45	20
1,2,4-Trimethylbenzene	<1.0	H	1.0	0.47	ug/L			04/04/19 13:02	1
1,3,5-Trimethylbenzene	<20		20	6.2	ug/L			03/30/19 17:45	20
1,3,5-Trimethylbenzene	<1.0	H	1.0	0.31	ug/L			04/04/19 13:02	1
Vinyl acetate	<40		40	16	ug/L			03/30/19 17:45	20
Vinyl acetate	<2.0	H	2.0	0.81	ug/L			04/04/19 13:02	1
Vinyl chloride	<20		20	10	ug/L			03/30/19 17:45	20
Vinyl chloride	<1.0	H	1.0	0.50	ug/L			04/04/19 13:02	1
Xylenes, Total	<20		20	4.6	ug/L			03/30/19 17:45	20
Xylenes, Total	<1.0	H	1.0	0.23	ug/L			04/04/19 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/30/19 17:45*	*20*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 13:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*73 - 131*		*03/30/19 17:45*	*20*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/04/19 13:02*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/30/19 17:45*	*20*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 13:02*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/30/19 17:45*	*20*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/04/19 13:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	8.2		1.0	0.40	mg/L			04/05/19 17:16	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1000		200	55	ug/L			04/02/19 19:39	200

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	18	J	50	17	ug/L		03/31/19 13:11	04/01/19 13:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.1		1.0	0.50	mg/L			04/05/19 02:18	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-10 (032019)
Date Collected: 03/20/19 15:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:33	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:33	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 17:33	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:33	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:33	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:33	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 17:33	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:33	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:33	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
cis-1,2-Dichloroethene	**0.81**	**J**	1.0	0.41	ug/L			03/30/19 17:33	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:33	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:33	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:33	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:33	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:33	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:33	1
1,1-Dichloroethane	**7.4**		1.0	0.38	ug/L			03/30/19 17:33	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
1,1-Dichloroethene	**5.9**		1.0	0.36	ug/L			03/30/19 17:33	1
1,2-Dichloroethene, Total	**0.81**	**J**	2.0	0.37	ug/L			03/30/19 17:33	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:33	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:33	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:33	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:33	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:33	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:33	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:33	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:33	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:33	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:33	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:33	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-10 (032019)
Date Collected: 03/20/19 15:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:33	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:33	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:33	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
1,1,1-Trichloroethane	**0.45**	**J**	1.0	0.37	ug/L			03/30/19 17:33	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Trichloroethene	**7.8**		1.0	0.48	ug/L			03/30/19 17:33	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:33	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:33	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:33	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:33	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 17:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 17:33*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 17:33*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 17:33*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**46**		1.0	0.28	ug/L			04/02/19 03:06	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-12 (032019)
Date Collected: 03/20/19 15:05
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:58	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:58	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 17:58	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:58	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:58	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:58	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 17:58	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:58	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:58	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 17:58	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:58	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:58	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:58	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:58	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:58	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:58	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 17:58	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 17:58	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 17:58	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:58	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:58	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:58	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:58	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:58	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:58	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:58	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:58	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:58	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:58	1

Client Sample ID: MW-12 (032019)
Date Collected: 03/20/19 15:05
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:58	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:58	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:58	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:58	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:58	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:58	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/30/19 17:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 17:58*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 17:58*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/30/19 17:58*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**19**		1.0	0.40	mg/L			04/05/19 17:29	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**350**		100	28	ug/L			04/02/19 20:02	100

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**17**	**J**	50	17	ug/L		03/31/19 13:11	04/01/19 13:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.5**		1.0	0.50	mg/L			04/06/19 21:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-13 (032019)
Date Collected: 03/20/19 14:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	70	ug/L			04/01/19 13:37	10
Benzene	<10		10	4.3	ug/L			04/01/19 13:37	10
Bromobenzene	<10		10	5.0	ug/L			04/01/19 13:37	10
Bromochloromethane	<10		10	4.5	ug/L			04/01/19 13:37	10
Bromodichloromethane	<10		10	4.4	ug/L			04/01/19 13:37	10
Bromoform	<10		10	4.3	ug/L			04/01/19 13:37	10
Bromomethane	<50		50	25	ug/L			04/01/19 13:37	10
2-Butanone	<100		100	34	ug/L			04/01/19 13:37	10
Carbon disulfide	<20		20	10	ug/L			04/01/19 13:37	10
Carbon tetrachloride	<10		10	3.3	ug/L			04/01/19 13:37	10
Chlorobenzene	**740**		10	2.6	ug/L			04/01/19 13:37	10
Chloroethane	<50		50	25	ug/L			04/01/19 13:37	10
2-Chloroethyl vinyl ether	<100		100	50	ug/L			04/01/19 13:37	10
Chloroform	<10		10	5.0	ug/L			04/01/19 13:37	10
Chloromethane	<10		10	4.0	ug/L			04/01/19 13:37	10
2-Chlorotoluene	<10		10	2.7	ug/L			04/01/19 13:37	10
4-Chlorotoluene	<10		10	4.5	ug/L			04/01/19 13:37	10
cis-1,2-Dichloroethene	**210**		10	4.1	ug/L			04/01/19 13:37	10
cis-1,3-Dichloropropene	<10		10	4.0	ug/L			04/01/19 13:37	10
Dibromochloromethane	<10		10	3.2	ug/L			04/01/19 13:37	10
1,2-Dibromo-3-Chloropropane	<50		50	11	ug/L			04/01/19 13:37	10
1,2-Dibromoethane	<10		10	4.4	ug/L			04/01/19 13:37	10
Dibromomethane	<10		10	3.5	ug/L			04/01/19 13:37	10
1,2-Dichlorobenzene	<10		10	3.7	ug/L			04/01/19 13:37	10
1,3-Dichlorobenzene	<10		10	4.3	ug/L			04/01/19 13:37	10
1,4-Dichlorobenzene	<10		10	4.6	ug/L			04/01/19 13:37	10
Dichlorodifluoromethane	<10		10	6.0	ug/L			04/01/19 13:37	10
1,1-Dichloroethane	**8.7**	**J**	10	3.8	ug/L			04/01/19 13:37	10
1,2-Dichloroethane	<10		10	5.0	ug/L			04/01/19 13:37	10
1,1-Dichloroethene	**8.4**	**J**	10	3.6	ug/L			04/01/19 13:37	10
1,2-Dichloroethene, Total	**210**		20	3.7	ug/L			04/01/19 13:37	10
1,2-Dichloropropane	<10		10	6.7	ug/L			04/01/19 13:37	10
1,3-Dichloropropane	<10		10	3.4	ug/L			04/01/19 13:37	10
2,2-Dichloropropane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1-Dichloropropene	<10		10	3.4	ug/L			04/01/19 13:37	10
Ethylbenzene	<10		10	3.3	ug/L			04/01/19 13:37	10
Hexachlorobutadiene	<50		50	25	ug/L			04/01/19 13:37	10
2-Hexanone	<100		100	20	ug/L			04/01/19 13:37	10
Isopropylbenzene	<10		10	3.5	ug/L			04/01/19 13:37	10
Methylene Chloride	<50		50	25	ug/L			04/01/19 13:37	10
4-Methyl-2-pentanone	<100		100	21	ug/L			04/01/19 13:37	10
Methyl tert-butyl ether	<100		100	3.0	ug/L			04/01/19 13:37	10
m-Xylene & p-Xylene	<10		10	3.5	ug/L			04/01/19 13:37	10
n-Butylbenzene	<10		10	4.7	ug/L			04/01/19 13:37	10
N-Propylbenzene	<10		10	3.8	ug/L			04/01/19 13:37	10
o-Xylene	<10		10	2.3	ug/L			04/01/19 13:37	10
p-Isopropyltoluene	<10		10	4.8	ug/L			04/01/19 13:37	10
sec-Butylbenzene	<10	*	10	4.2	ug/L			04/01/19 13:37	10
Styrene	<10		10	2.7	ug/L			04/01/19 13:37	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-13 (032019)
Date Collected: 03/20/19 14:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<10		10	4.5	ug/L			04/01/19 13:37	10
1,1,1,2-Tetrachloroethane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1,2,2-Tetrachloroethane	<10		10	6.2	ug/L			04/01/19 13:37	10
Tetrachloroethene	<10		10	7.4	ug/L			04/01/19 13:37	10
Toluene	<10		10	4.8	ug/L			04/01/19 13:37	10
trans-1,2-Dichloroethene	<10		10	3.7	ug/L			04/01/19 13:37	10
trans-1,3-Dichloropropene	<10		10	4.2	ug/L			04/01/19 13:37	10
1,2,3-Trichlorobenzene	<50		50	25	ug/L			04/01/19 13:37	10
1,2,4-Trichlorobenzene	<50		50	25	ug/L			04/01/19 13:37	10
1,1,1-Trichloroethane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1,2-Trichloroethane	<10		10	3.3	ug/L			04/01/19 13:37	10
Trichloroethene	**350**		10	4.8	ug/L			04/01/19 13:37	10
Trichlorofluoromethane	<10		10	4.2	ug/L			04/01/19 13:37	10
1,2,3-Trichloropropane	<10		10	3.9	ug/L			04/01/19 13:37	10
1,2,4-Trimethylbenzene	<10		10	4.7	ug/L			04/01/19 13:37	10
1,3,5-Trimethylbenzene	<10		10	3.1	ug/L			04/01/19 13:37	10
Vinyl acetate	<20		20	8.1	ug/L			04/01/19 13:37	10
Vinyl chloride	<10		10	5.0	ug/L			04/01/19 13:37	10
Xylenes, Total	<10		10	2.3	ug/L			04/01/19 13:37	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 120*		*04/01/19 13:37*	*10*
1,2-Dichloroethane-d4 (Surr)	*110*		*73 - 131*		*04/01/19 13:37*	*10*
Dibromofluoromethane (Surr)	*112*		*80 - 122*		*04/01/19 13:37*	*10*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*04/01/19 13:37*	*10*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**250**		100	28	ug/L			04/02/19 20:25	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-20 (032019)
Date Collected: 03/20/19 13:30
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 18:24	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 18:24	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 18:24	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 18:24	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 18:24	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 18:24	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 18:24	1
Chloroethane	**20**		5.0	2.5	ug/L			03/30/19 18:24	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 18:24	1
Chloroform	**0.55**	**J**	1.0	0.50	ug/L			03/30/19 18:24	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 18:24	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 18:24	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
cis-1,2-Dichloroethene	**0.67**	**J**	1.0	0.41	ug/L			03/30/19 18:24	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 18:24	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 18:24	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 18:24	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 18:24	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 18:24	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 18:24	1
1,1-Dichloroethane	**110**		1.0	0.38	ug/L			03/30/19 18:24	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 18:24	1
1,1-Dichloroethene	**29**		1.0	0.36	ug/L			03/30/19 18:24	1
1,2-Dichloroethene, Total	**0.67**	**J**	2.0	0.37	ug/L			03/30/19 18:24	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 18:24	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 18:24	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 18:24	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 18:24	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 18:24	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 18:24	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:24	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 18:24	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 18:24	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 18:24	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 18:24	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-20 (032019)
Date Collected: 03/20/19 13:30
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 18:24	1
Tetrachloroethene	**0.80**	**J**	1.0	0.74	ug/L			03/30/19 18:24	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 18:24	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
1,1,1-Trichloroethane	**120**		1.0	0.37	ug/L			03/30/19 18:24	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Trichloroethene	**5.8**		1.0	0.48	ug/L			03/30/19 18:24	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 18:24	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:24	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 18:24	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 18:24	1
Vinyl chloride	**3.9**		1.0	0.50	ug/L			03/30/19 18:24	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 18:24*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 18:24*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 18:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 18:24*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**480**		100	28	ug/L			04/02/19 20:48	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	**2.7**		0.20	0.10	mg/L		04/02/19 11:37	04/03/19 11:47	1
Nitrate Nitrite as N	**0.93**		0.50	0.10	mg/L			03/27/19 09:32	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-22 (032019)
Date Collected: 03/20/19 12:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 18:50	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 18:50	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 18:50	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 18:50	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 18:50	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 18:50	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 18:50	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 18:50	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 18:50	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
cis-1,2-Dichloroethene	**2.1**		1.0	0.41	ug/L			03/30/19 18:50	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 18:50	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 18:50	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 18:50	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 18:50	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 18:50	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 18:50	1
1,1-Dichloroethane	**38**		1.0	0.38	ug/L			03/30/19 18:50	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
1,1-Dichloroethene	**9.9**		1.0	0.36	ug/L			03/30/19 18:50	1
1,2-Dichloroethene, Total	**2.1**		2.0	0.37	ug/L			03/30/19 18:50	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 18:50	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 18:50	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 18:50	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 18:50	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 18:50	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 18:50	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:50	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 18:50	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 18:50	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 18:50	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 18:50	1

Client Sample ID: MW-22 (032019)
Date Collected: 03/20/19 12:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 18:50	1
Tetrachloroethene	**13**		1.0	0.74	ug/L			03/30/19 18:50	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 18:50	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
1,1,1-Trichloroethane	**78**		1.0	0.37	ug/L			03/30/19 18:50	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Trichloroethene	**21**		1.0	0.48	ug/L			03/30/19 18:50	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 18:50	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:50	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 18:50	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 18:50	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 18:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 18:50*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*03/30/19 18:50*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 18:50*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**23**		1.0	0.40	mg/L			04/05/19 17:41	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**24**		1.0	0.28	ug/L			04/02/19 05:24	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**57**		50	17	ug/L		03/31/19 13:11	04/01/19 13:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	**0.13**	**J**	0.20	0.10	mg/L		04/02/19 11:33	04/03/19 11:06	1
Nitrate Nitrite as N	**0.87**		0.050	0.010	mg/L			04/06/19 12:29	1
Total Organic Carbon	**0.68**	**J**	1.0	0.50	mg/L			04/06/19 22:24	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: DUP-02 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 19:15	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 19:15	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 19:15	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 19:15	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 19:15	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 19:15	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 19:15	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 19:15	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 19:15	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 19:15	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 19:15	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 19:15	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 19:15	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 19:15	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 19:15	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 19:15	1
1,1-Dichloroethane	**3.6**		1.0	0.38	ug/L			03/30/19 19:15	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
1,1-Dichloroethene	**1.1**		1.0	0.36	ug/L			03/30/19 19:15	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 19:15	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 19:15	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 19:15	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 19:15	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 19:15	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 19:15	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 19:15	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 19:15	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 19:15	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 19:15	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 19:15	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: DUP-02 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 19:15	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 19:15	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
1,1,1-Trichloroethane	**47**		1.0	0.37	ug/L			03/30/19 19:15	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 19:15	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 19:15	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 19:15	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 19:15	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 19:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 19:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 19:15*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 19:15*	*1*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*03/30/19 19:15*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**8.2**		1.0	0.40	mg/L			04/05/19 17:54	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**960**		200	55	ug/L			04/02/19 21:11	200

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/31/19 13:11	04/01/19 13:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0	0.50	mg/L			04/06/19 22:50	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-27 (032119)
Date Collected: 03/21/19 11:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 15:50	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 15:50	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 15:50	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 15:50	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 15:50	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 15:50	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 15:50	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 15:50	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 15:50	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 15:50	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 15:50	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 15:50	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 15:50	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 15:50	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 15:50	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 15:50	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 15:50	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 15:50	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 15:50	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 15:50	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 15:50	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 15:50	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 15:50	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 15:50	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/02/19 02:13	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 15:50	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 15:50	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 15:50	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 15:50	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/02/19 02:13	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 15:50	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 15:50	1
o-Xylene	**0.31**	**J**	1.0	0.23	ug/L			03/30/19 15:50	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 15:50	1

Client Sample ID: GM-27 (032119)
Date Collected: 03/21/19 11:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 15:50	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 15:50	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 15:50	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 15:50	1
1,2,4-Trimethylbenzene	**1.5**		1.0	0.47	ug/L			03/30/19 15:50	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 15:50	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 15:50	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Xylenes, Total	**1.5**		1.0	0.23	ug/L			03/30/19 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 15:50*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/02/19 02:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 15:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*04/02/19 02:13*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 15:50*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 122*		*04/02/19 02:13*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 15:50*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*04/02/19 02:13*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 17:19	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*38 - 125*	*03/26/19 11:53*	*03/27/19 17:19*	*1*
Terphenyl-d14	*72*		*70 - 130*	*03/26/19 11:53*	*03/27/19 17:19*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/02/19 06:09	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: TB-02
Date Collected: 03/20/19 00:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 11:58	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 11:58	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/30/19 11:58	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 11:58	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 11:58	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 11:58	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 11:58	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 11:58	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 11:58	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 11:58	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 11:58	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 11:58	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 11:58	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 11:58	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 11:58	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 11:58	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 11:58	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 11:58	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 11:58	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 11:58	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 11:58	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 11:58	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 11:58	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 11:58	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 11:58	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:58	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 11:58	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 11:58	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 11:58	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: TB-02
Date Collected: 03/20/19 00:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 11:58	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 11:58	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 11:58	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:58	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 11:58	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 11:58	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 11:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 11:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 11:58*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/30/19 11:58*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 11:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**98**		10	7.0	ug/L			04/01/19 17:21	1
Benzene	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/01/19 17:21	1
Bromoform	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/01/19 17:21	1
2-Butanone	<10		10	3.4	ug/L			04/01/19 17:21	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/01/19 17:21	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/01/19 17:21	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/01/19 17:21	1
Chloroform	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/01/19 17:21	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/01/19 17:21	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/01/19 17:21	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/01/19 17:21	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/01/19 17:21	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/01/19 17:21	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/01/19 17:21	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/01/19 17:21	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/01/19 17:21	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/01/19 17:21	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/01/19 17:21	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/01/19 17:21	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/01/19 17:21	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/01/19 17:21	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/01/19 17:21	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
2-Hexanone	<10		10	2.0	ug/L			04/01/19 17:21	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/01/19 17:21	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/01/19 17:21	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 17:21	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/01/19 17:21	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/01/19 17:21	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/01/19 17:21	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
Styrene	<1.0		1.0	0.27	ug/L			04/01/19 17:21	1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/01/19 17:21	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/01/19 17:21	1
Toluene	<1.0		1.0	0.48	ug/L			04/01/19 17:21	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Trichloroethene	**1.2**		1.0	0.48	ug/L			04/01/19 17:21	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/01/19 17:21	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 17:21	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/01/19 17:21	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/01/19 17:21	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/01/19 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/01/19 17:21*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*04/01/19 17:21*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/01/19 17:21*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/01/19 17:21*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 17:41	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*83*		*38 - 125*	*03/26/19 11:53*	*03/27/19 17:41*	*1*
Terphenyl-d14	*88*		*70 - 130*	*03/26/19 11:53*	*03/27/19 17:41*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Acenaphthylene	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Acetophenone	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
Anthracene	<18		18	1.2	ug/L		03/28/19 16:10	03/29/19 18:59	1
Atrazine	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzaldehyde	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[a]anthracene	<18		18	0.97	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[a]pyrene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[b]fluoranthene	<18		18	4.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[g,h,i]perylene	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[k]fluoranthene	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,1'-Biphenyl	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
Bis(2-chloroethoxy)methane	<18		18	1.7	ug/L		03/28/19 16:10	03/29/19 18:59	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-chloroethyl)ether	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
bis (2-chloroisopropyl) ether	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Bis(2-ethylhexyl) phthalate	<18		18	2.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Bromophenyl phenyl ether	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Butyl benzyl phthalate	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Caprolactam	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Carbazole	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chloroaniline	<35		35	3.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chloro-3-methylphenol	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Chloronaphthalene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Chlorophenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chlorophenyl phenyl ether	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Chrysene	<18		18	0.90	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dibenz(a,h)anthracene	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dibenzofuran	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,2-Dichlorobenzene	<18		18	0.94	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,3-Dichlorobenzene	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,4-Dichlorobenzene	<18		18	0.95	ug/L		03/28/19 16:10	03/29/19 18:59	1
3,3'-Dichlorobenzidine	<110		110	53	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dichlorophenol	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Diethyl phthalate	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dimethylphenol	<18		18	7.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dimethyl phthalate	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Di-n-butyl phthalate	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
4,6-Dinitro-2-methylphenol	<88		88	18	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dinitrophenol	<88		88	18	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dinitrotoluene	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,6-Dinitrotoluene	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Di-n-octyl phthalate	<18		18	2.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Fluoranthene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Fluorene	<18		18	1.7	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorobenzene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorobutadiene	<18		18	1.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorocyclopentadiene	<18		18	4.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachloroethane	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Indeno[1,2,3-cd]pyrene	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Isophorone	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Methylnaphthalene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Methylphenol	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
3 & 4 Methylphenol	<18		18	2.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Nitroaniline	<88		88	2.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
3-Nitroaniline	<88		88	8.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Nitroaniline	<88		88	8.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Nitrobenzene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Nitrophenol	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Nitrophenol	<88		88	3.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
N-Nitrosodi-n-propylamine	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
N-Nitrosodiphenylamine	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
Pentachlorophenol	<88		88	3.5	ug/L		03/28/19 16:10	03/29/19 18:59	1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Phenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Pyrene	<18		18	1.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,2,4-Trichlorobenzene	<18		18	0.99	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4,5-Trichlorophenol	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4,6-Trichlorophenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*31*	*X*	*32 - 113*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
2-Fluorophenol	*29*		*26 - 109*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Nitrobenzene-d5	*32*		*32 - 118*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Phenol-d5	*27*		*27 - 110*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Terphenyl-d14	*28*		*10 - 126*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
2,4,6-Tribromophenol	*36*	*X*	*39 - 124*	*03/28/19 16:10*	*03/29/19 18:59*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/05/19 22:45	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/03/19 21:10	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<200		200	24	ug/L		04/01/19 11:47	04/04/19 18:47	1
Antimony	<20		20	5.3	ug/L		04/01/19 11:47	04/04/19 18:47	1
Arsenic	<20		20	6.2	ug/L		04/01/19 11:47	04/04/19 18:47	1
Barium	<10		10	1.7	ug/L		04/01/19 11:47	04/04/19 18:47	1
Beryllium	<4.0		4.0	0.10	ug/L		04/01/19 11:47	04/04/19 18:47	1
Cadmium	<5.0		5.0	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Calcium	**200**	**J**	500	25	ug/L		04/01/19 11:47	04/04/19 18:47	1
Chromium	<10		10	1.6	ug/L		04/01/19 11:47	04/04/19 18:47	1
Cobalt	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Copper	**6.3**	**J B**	20	1.8	ug/L		04/01/19 11:47	04/04/19 18:47	1
Iron	<50		50	17	ug/L		04/01/19 11:47	04/04/19 18:47	1
Lead	<10		10	3.9	ug/L		04/01/19 11:47	04/04/19 18:47	1
Magnesium	**43**	**J**	500	33	ug/L		04/01/19 11:47	04/04/19 18:47	1
Manganese	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Nickel	<40		40	2.1	ug/L		04/01/19 11:47	04/04/19 18:47	1
Potassium	<1000		1000	17	ug/L		04/01/19 11:47	04/04/19 18:47	1
Selenium	<20		20	9.9	ug/L		04/01/19 11:47	04/04/19 18:47	1
Silver	<10		10	0.60	ug/L		04/01/19 11:47	04/04/19 18:47	1
Sodium	**710**	**J**	1000	480	ug/L		04/01/19 11:47	04/04/19 18:47	1
Thallium	<25		25	6.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Vanadium	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Zinc	<20		20	7.0	ug/L		04/01/19 11:47	04/04/19 18:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/31/19 13:11	04/01/19 13:22	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)

Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13

Matrix: Water

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20	^	0.20	0.080	ug/L		04/03/19 13:10	04/08/19 11:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	<0.20		0.20	0.10	mg/L		04/02/19 11:33	04/03/19 11:05	1
Nitrate Nitrite as N	<0.050		0.050	0.010	mg/L			04/06/19 12:30	1
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/06/19 23:09	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-166366-1	GM-9M (032019)	103	88	94	100
680-166366-2	GM-10S (032019)	104	88	94	99
680-166366-3	MW-1 (032019)	103	89	96	100
680-166366-4	MW-2 (032019)	97	105	105	103
680-166366-4	MW-2 (032019)	103	84	94	100
680-166366-5	MW-10 (032019)	103	88	94	99
680-166366-6	MW-12 (032019)	105	87	94	98
680-166366-7	MW-13 (032019)	100	110	112	89
680-166366-8	MW-20 (032019)	104	88	94	99
680-166366-9	MW-22 (032019)	103	88	96	100
680-166366-10	DUP-02 (032019)	104	87	94	101
680-166366-11	GM-27 (032119)	103	88	94	100
680-166366-11	GM-27 (032119)	98	98	107	92
680-166366-12	TB-02	104	87	93	99
680-166366-13	EB-01 (032119)	104	87	94	100
LCS 680-564388/4	Lab Control Sample	105	100	102	106
LCS 680-564389/4	Lab Control Sample	104	92	99	99
LCS 680-564517/3	Lab Control Sample	102	95	100	93
LCS 680-564521/4	Lab Control Sample	105	88	96	97
LCS 680-564619/4	Lab Control Sample	101	92	99	105
LCS 680-565029/4	Lab Control Sample	102	88	96	96
LCSD 680-564388/5	Lab Control Sample Dup	106	97	103	105
LCSD 680-564389/5	Lab Control Sample Dup	105	89	97	98
LCSD 680-564517/4	Lab Control Sample Dup	100	91	98	87
LCSD 680-564521/5	Lab Control Sample Dup	104	90	96	99
LCSD 680-564619/5	Lab Control Sample Dup	104	89	99	96
LCSD 680-565029/5	Lab Control Sample Dup	101	87	95	94
MB 680-564388/9	Method Blank	105	94	98	106
MB 680-564389/9	Method Blank	105	86	94	98
MB 680-564517/8	Method Blank	100	93	103	92
MB 680-564521/8	Method Blank	104	86	92	97
MB 680-564619/10	Method Blank	103	93	102	94
MB 680-565029/8	Method Blank	103	85	94	96

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(32-113)	(26-109)	(32-118)	(27-110)	(10-126)	(39-124)
680-166366-13	EB-01 (032119)	31 X	29	32	27	28	36 X
LCS 680-564109/20-A	Lab Control Sample	63	59	63	62	59	82
MB 680-564109/19-A	Method Blank	48	64	72	69	64	80

Surrogate Legend

Surrogate Summary

Client: ARCADIS U.S., Inc.
Job ID: 680-166366-1
Project/Site: ATK Orbital Elkton

FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
TPHL = Terphenyl-d14
TBP = 2,4,6-Tribromophenol

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		NBZ	TPHL								
Lab Sample ID	Client Sample ID	(38-125)	(70-130)								
680-166366-1	GM-9M (032019)	67	62 X								
680-166366-2	GM-10S (032019)	80	81								
680-166366-11	GM-27 (032119)	70	72								
680-166366-13	EB-01 (032119)	83	88								
MB 460-598021/1-A	Method Blank	82	89								

Surrogate Legend

NBZ = Nitrobenzene-d5
TPHL = Terphenyl-d14

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		NBZ	TPHL								
Lab Sample ID	Client Sample ID										
LCSD 460-598021/3-A	Lab Control Sample Dup										

Surrogate Legend

NBZ = Nitrobenzene-d5
TPHL = Terphenyl-d14

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-564388/9
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 11:11	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 11:11	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 11:11	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 11:11	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 11:11	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 11:11	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 11:11	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 11:11	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 11:11	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 11:11	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 11:11	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 11:11	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 11:11	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 11:11	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 11:11	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 11:11	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 11:11	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 11:11	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 11:11	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 11:11	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 11:11	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 11:11	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 11:11	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 11:11	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 11:11	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 11:11	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 11:11	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 11:11	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 11:11	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 11:11	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 11:11	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 11:11	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 11:11	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 11:11	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 11:11	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 11:11	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 11:11	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 11:11	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 11:11	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:11	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 11:11	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 11:11	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 11:11	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 11:11	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564388/9
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 11:11	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 11:11	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:11	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 11:11	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 11:11	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 11:11	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 11:11	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 11:11	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:11	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:11	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 11:11	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 11:11	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 11:11	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 11:11	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:11	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 11:11	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 11:11	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 11:11	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/30/19 11:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*03/30/19 11:11*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*03/30/19 11:11*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*03/30/19 11:11*	*1*

Lab Sample ID: LCS 680-564388/4
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	253		ug/L		101	70 - 135
Benzene	50.0	50.2		ug/L		100	80 - 120
Bromobenzene	50.0	52.3		ug/L		105	80 - 121
Bromochloromethane	50.0	52.3		ug/L		105	80 - 120
Bromodichloromethane	50.0	50.6		ug/L		101	80 - 120
Bromoform	50.0	51.8		ug/L		104	74 - 126
Bromomethane	50.0	45.8		ug/L		92	62 - 130
2-Butanone	250	254		ug/L		102	80 - 131
Carbon disulfide	50.0	48.6		ug/L		97	80 - 120
Carbon tetrachloride	50.0	51.1		ug/L		102	76 - 123
Chlorobenzene	50.0	52.6		ug/L		105	80 - 120
Chloroethane	50.0	47.2		ug/L		94	66 - 135
2-Chloroethyl vinyl ether	50.0	43.1		ug/L		86	71 - 135
Chloroform	50.0	50.1		ug/L		100	80 - 120
Chloromethane	50.0	46.5		ug/L		93	69 - 131
2-Chlorotoluene	50.0	52.1		ug/L		104	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564388/4
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	52.6		ug/L		105	80 - 120
cis-1,2-Dichloroethene	50.0	53.6		ug/L		107	80 - 120
cis-1,3-Dichloropropene	50.0	53.2		ug/L		106	80 - 120
Dibromochloromethane	50.0	52.6		ug/L		105	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	51.2		ug/L		102	71 - 134
1,2-Dibromoethane	50.0	50.2		ug/L		100	80 - 120
Dibromomethane	50.0	49.9		ug/L		100	80 - 120
1,2-Dichlorobenzene	50.0	49.8		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	50.4		ug/L		101	80 - 120
1,4-Dichlorobenzene	50.0	49.8		ug/L		100	80 - 120
Dichlorodifluoromethane	50.0	40.1		ug/L		80	47 - 155
1,1-Dichloroethane	50.0	49.9		ug/L		100	80 - 120
1,2-Dichloroethane	50.0	50.4		ug/L		101	80 - 120
1,1-Dichloroethene	50.0	50.5		ug/L		101	76 - 120
1,2-Dichloroethene, Total	100	105		ug/L		105	80 - 120
1,2-Dichloropropane	50.0	50.9		ug/L		102	80 - 120
1,3-Dichloropropane	50.0	49.3		ug/L		99	80 - 120
2,2-Dichloropropane	50.0	62.0		ug/L		124	76 - 126
1,1-Dichloropropene	50.0	51.0		ug/L		102	80 - 120
Ethylbenzene	50.0	52.5		ug/L		105	80 - 120
Hexachlorobutadiene	50.0	56.9		ug/L		114	60 - 140
2-Hexanone	250	245		ug/L		98	74 - 127
Isopropylbenzene	50.0	54.1		ug/L		108	80 - 120
Methylene Chloride	50.0	46.2		ug/L		92	80 - 120
4-Methyl-2-pentanone	250	255		ug/L		102	76 - 124
Methyl tert-butyl ether	50.0	49.7		ug/L		99	80 - 120
m-Xylene & p-Xylene	50.0	52.4		ug/L		105	80 - 120
n-Butylbenzene	50.0	53.8		ug/L		108	80 - 120
N-Propylbenzene	50.0	53.4		ug/L		107	80 - 120
o-Xylene	50.0	53.3		ug/L		107	80 - 120
p-Isopropyltoluene	50.0	55.3		ug/L		111	80 - 120
sec-Butylbenzene	50.0	53.1		ug/L		106	80 - 120
Styrene	50.0	54.5		ug/L		109	80 - 120
tert-Butylbenzene	50.0	52.6		ug/L		105	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.4		ug/L		103	80 - 121
1,1,2,2-Tetrachloroethane	50.0	50.2		ug/L		100	80 - 120
Tetrachloroethene	50.0	50.7		ug/L		101	80 - 121
Toluene	50.0	51.3		ug/L		103	80 - 113
trans-1,2-Dichloroethene	50.0	51.3		ug/L		103	80 - 120
trans-1,3-Dichloropropene	50.0	50.7		ug/L		101	80 - 120
1,2,3-Trichlorobenzene	50.0	52.6		ug/L		105	61 - 141
1,2,4-Trichlorobenzene	50.0	53.5		ug/L		107	68 - 128
1,1,1-Trichloroethane	50.0	51.8		ug/L		104	80 - 120
1,1,2-Trichloroethane	50.0	49.7		ug/L		99	80 - 120
Trichloroethene	50.0	50.1		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	49.5		ug/L		99	60 - 141
1,2,3-Trichloropropane	50.0	49.7		ug/L		99	80 - 123
1,2,4-Trimethylbenzene	50.0	53.6		ug/L		107	80 - 120
1,3,5-Trimethylbenzene	50.0	54.0		ug/L		108	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564388/4
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl acetate	100	118		ug/L		118	67 - 135
Vinyl chloride	50.0	47.9		ug/L		96	71 - 128
Xylenes, Total	100	106		ug/L		106	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*105*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*100*		*73 - 131*
Dibromofluoromethane (Surr)	*102*		*80 - 122*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*

Lab Sample ID: LCSD 680-564388/5
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	243		ug/L		97	70 - 135	4	30
Benzene	50.0	50.9		ug/L		102	80 - 120	1	20
Bromobenzene	50.0	52.8		ug/L		106	80 - 121	1	20
Bromochloromethane	50.0	51.2		ug/L		102	80 - 120	2	20
Bromodichloromethane	50.0	50.8		ug/L		102	80 - 120	0	20
Bromoform	50.0	51.3		ug/L		103	74 - 126	1	20
Bromomethane	50.0	52.7		ug/L		105	62 - 130	14	20
2-Butanone	250	250		ug/L		100	80 - 131	2	20
Carbon disulfide	50.0	51.4		ug/L		103	80 - 120	6	20
Carbon tetrachloride	50.0	53.1		ug/L		106	76 - 123	4	20
Chlorobenzene	50.0	52.9		ug/L		106	80 - 120	1	20
Chloroethane	50.0	46.3		ug/L		93	66 - 135	2	20
2-Chloroethyl vinyl ether	50.0	40.8		ug/L		82	71 - 135	5	50
Chloroform	50.0	50.7		ug/L		101	80 - 120	1	20
Chloromethane	50.0	47.8		ug/L		96	69 - 131	3	30
2-Chlorotoluene	50.0	53.7		ug/L		107	80 - 120	3	20
4-Chlorotoluene	50.0	53.2		ug/L		106	80 - 120	1	20
cis-1,2-Dichloroethene	50.0	53.3		ug/L		107	80 - 120	1	20
cis-1,3-Dichloropropene	50.0	53.4		ug/L		107	80 - 120	0	20
Dibromochloromethane	50.0	52.3		ug/L		105	80 - 121	1	20
1,2-Dibromo-3-Chloropropane	50.0	49.9		ug/L		100	71 - 134	3	20
1,2-Dibromoethane	50.0	49.4		ug/L		99	80 - 120	2	20
Dibromomethane	50.0	49.0		ug/L		98	80 - 120	2	20
1,2-Dichlorobenzene	50.0	50.7		ug/L		101	80 - 120	2	20
1,3-Dichlorobenzene	50.0	51.3		ug/L		103	80 - 120	2	20
1,4-Dichlorobenzene	50.0	50.5		ug/L		101	80 - 120	1	20
Dichlorodifluoromethane	50.0	40.8		ug/L		82	47 - 155	2	40
1,1-Dichloroethane	50.0	50.9		ug/L		102	80 - 120	2	20
1,2-Dichloroethane	50.0	48.8		ug/L		98	80 - 120	3	50
1,1-Dichloroethene	50.0	50.9		ug/L		102	76 - 120	1	20
1,2-Dichloroethene, Total	100	106		ug/L		106	80 - 120	1	20
1,2-Dichloropropane	50.0	50.4		ug/L		101	80 - 120	1	20
1,3-Dichloropropane	50.0	48.7		ug/L		97	80 - 120	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564388/5
Matrix: Water
Analysis Batch: 564388

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,2-Dichloropropane	50.0	62.6		ug/L		125	76 - 126	1	20
1,1-Dichloropropene	50.0	52.1		ug/L		104	80 - 120	2	20
Ethylbenzene	50.0	53.7		ug/L		107	80 - 120	2	20
Hexachlorobutadiene	50.0	56.5		ug/L		113	60 - 140	1	20
2-Hexanone	250	241		ug/L		96	74 - 127	2	20
Isopropylbenzene	50.0	55.5		ug/L		111	80 - 120	3	20
Methylene Chloride	50.0	46.9		ug/L		94	80 - 120	2	20
4-Methyl-2-pentanone	250	251		ug/L		100	76 - 124	2	20
Methyl tert-butyl ether	50.0	49.1		ug/L		98	80 - 120	1	20
m-Xylene & p-Xylene	50.0	54.6		ug/L		109	80 - 120	4	20
n-Butylbenzene	50.0	55.0		ug/L		110	80 - 120	2	20
N-Propylbenzene	50.0	55.8		ug/L		112	80 - 120	5	20
o-Xylene	50.0	55.4		ug/L		111	80 - 120	4	30
p-Isopropyltoluene	50.0	56.5		ug/L		113	80 - 120	2	20
sec-Butylbenzene	50.0	54.9		ug/L		110	80 - 120	3	20
Styrene	50.0	56.6		ug/L		113	80 - 120	4	20
tert-Butylbenzene	50.0	55.5		ug/L		111	80 - 121	5	20
1,1,1,2-Tetrachloroethane	50.0	52.7		ug/L		105	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	50.6		ug/L		101	80 - 120	1	20
Tetrachloroethene	50.0	51.3		ug/L		103	80 - 121	1	20
Toluene	50.0	52.3		ug/L		105	80 - 113	2	20
trans-1,2-Dichloroethene	50.0	52.9		ug/L		106	80 - 120	3	20
trans-1,3-Dichloropropene	50.0	48.9		ug/L		98	80 - 120	4	30
1,2,3-Trichlorobenzene	50.0	53.3		ug/L		107	61 - 141	1	20
1,2,4-Trichlorobenzene	50.0	54.0		ug/L		108	68 - 128	1	20
1,1,1-Trichloroethane	50.0	52.4		ug/L		105	80 - 120	1	20
1,1,2-Trichloroethane	50.0	49.9		ug/L		100	80 - 120	0	20
Trichloroethene	50.0	51.0		ug/L		102	80 - 120	2	20
Trichlorofluoromethane	50.0	51.0		ug/L		102	60 - 141	3	20
1,2,3-Trichloropropane	50.0	49.5		ug/L		99	80 - 123	0	30
1,2,4-Trimethylbenzene	50.0	55.8		ug/L		112	80 - 120	4	20
1,3,5-Trimethylbenzene	50.0	55.5		ug/L		111	80 - 120	3	20
Vinyl acetate	100	116		ug/L		116	67 - 135	2	20
Vinyl chloride	50.0	49.0		ug/L		98	71 - 128	2	20
Xylenes, Total	100	110		ug/L		110	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*106*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*
Dibromofluoromethane (Surr)	*103*		*80 - 122*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*

Lab Sample ID: MB 680-564389/9
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 11:33	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564389/9
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 11:33	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 11:33	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 11:33	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 11:33	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 11:33	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 11:33	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 11:33	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 11:33	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 11:33	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			03/30/19 11:33	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 11:33	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 11:33	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 11:33	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 11:33	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 11:33	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 11:33	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 11:33	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 11:33	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 11:33	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 11:33	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 11:33	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 11:33	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 11:33	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 11:33	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 11:33	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 11:33	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 11:33	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 11:33	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 11:33	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 11:33	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 11:33	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 11:33	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 11:33	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 11:33	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 11:33	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 11:33	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 11:33	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 11:33	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:33	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 11:33	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 11:33	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 11:33	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 11:33	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 11:33	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 11:33	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564389/9
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:33	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 11:33	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 11:33	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 11:33	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 11:33	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 11:33	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:33	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:33	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 11:33	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 11:33	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 11:33	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 11:33	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:33	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 11:33	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 11:33	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 11:33	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 11:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/30/19 11:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*03/30/19 11:33*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 11:33*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/30/19 11:33*	*1*

Lab Sample ID: LCS 680-564389/4
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	260		ug/L		104	70 - 135
Benzene	50.0	51.7		ug/L		103	80 - 120
Bromobenzene	50.0	53.9		ug/L		108	80 - 121
Bromochloromethane	50.0	50.6		ug/L		101	80 - 120
Bromodichloromethane	50.0	51.6		ug/L		103	80 - 120
Bromoform	50.0	54.5		ug/L		109	74 - 126
Bromomethane	50.0	71.2	*	ug/L		142	62 - 130
2-Butanone	250	269		ug/L		108	80 - 131
Carbon disulfide	50.0	51.3		ug/L		103	80 - 120
Carbon tetrachloride	50.0	52.5		ug/L		105	76 - 123
Chlorobenzene	50.0	53.1		ug/L		106	80 - 120
Chloroethane	50.0	59.5		ug/L		119	66 - 135
2-Chloroethyl vinyl ether	50.0	50.3		ug/L		101	71 - 135
Chloroform	50.0	49.8		ug/L		100	80 - 120
Chloromethane	50.0	55.7		ug/L		111	69 - 131
2-Chlorotoluene	50.0	51.9		ug/L		104	80 - 120
4-Chlorotoluene	50.0	52.7		ug/L		105	80 - 120
cis-1,2-Dichloroethene	50.0	53.7		ug/L		107	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564389/4
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	50.0	53.4		ug/L		107	80 - 120
Dibromochloromethane	50.0	53.1		ug/L		106	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	55.8		ug/L		112	71 - 134
1,2-Dibromoethane	50.0	50.4		ug/L		101	80 - 120
Dibromomethane	50.0	51.5		ug/L		103	80 - 120
1,2-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	50.6		ug/L		101	80 - 120
1,4-Dichlorobenzene	50.0	51.1		ug/L		102	80 - 120
Dichlorodifluoromethane	50.0	45.0		ug/L		90	47 - 155
1,1-Dichloroethane	50.0	52.5		ug/L		105	80 - 120
1,2-Dichloroethane	50.0	46.6		ug/L		93	80 - 120
1,1-Dichloroethene	50.0	57.7		ug/L		115	76 - 120
1,2-Dichloroethene, Total	100	107		ug/L		107	80 - 120
1,2-Dichloropropane	50.0	54.0		ug/L		108	80 - 120
1,3-Dichloropropane	50.0	51.2		ug/L		102	80 - 120
2,2-Dichloropropane	50.0	56.4		ug/L		113	76 - 126
1,1-Dichloropropene	50.0	50.6		ug/L		101	80 - 120
Ethylbenzene	50.0	52.6		ug/L		105	80 - 120
Hexachlorobutadiene	50.0	56.0		ug/L		112	60 - 140
2-Hexanone	250	251		ug/L		101	74 - 127
Isopropylbenzene	50.0	54.0		ug/L		108	80 - 120
Methylene Chloride	50.0	50.1		ug/L		100	80 - 120
4-Methyl-2-pentanone	250	253		ug/L		101	76 - 124
Methyl tert-butyl ether	50.0	49.5		ug/L		99	80 - 120
m-Xylene & p-Xylene	50.0	52.9		ug/L		106	80 - 120
n-Butylbenzene	50.0	52.6		ug/L		105	80 - 120
N-Propylbenzene	50.0	52.9		ug/L		106	80 - 120
o-Xylene	50.0	52.8		ug/L		106	80 - 120
p-Isopropyltoluene	50.0	53.0		ug/L		106	80 - 120
sec-Butylbenzene	50.0	53.7		ug/L		107	80 - 120
Styrene	50.0	53.6		ug/L		107	80 - 120
tert-Butylbenzene	50.0	53.7		ug/L		107	80 - 121
1,1,1,2-Tetrachloroethane	50.0	52.9		ug/L		106	80 - 121
1,1,2,2-Tetrachloroethane	50.0	52.7		ug/L		105	80 - 120
Tetrachloroethene	50.0	54.2		ug/L		108	80 - 121
Toluene	50.0	52.3		ug/L		105	80 - 113
trans-1,2-Dichloroethene	50.0	53.3		ug/L		107	80 - 120
trans-1,3-Dichloropropene	50.0	49.3		ug/L		99	80 - 120
1,2,3-Trichlorobenzene	50.0	52.5		ug/L		105	61 - 141
1,2,4-Trichlorobenzene	50.0	53.0		ug/L		106	68 - 128
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	80 - 120
1,1,2-Trichloroethane	50.0	52.6		ug/L		105	80 - 120
Trichloroethene	50.0	52.1		ug/L		104	80 - 120
Trichlorofluoromethane	50.0	55.4		ug/L		111	60 - 141
1,2,3-Trichloropropane	50.0	52.5		ug/L		105	80 - 123
1,2,4-Trimethylbenzene	50.0	53.5		ug/L		107	80 - 120
1,3,5-Trimethylbenzene	50.0	53.7		ug/L		107	80 - 120
Vinyl acetate	100	117		ug/L		117	67 - 135
Vinyl chloride	50.0	58.2		ug/L		116	71 - 128

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564389/4
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Xylenes, Total			100	106		ug/L		106	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*92*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 680-564389/5
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	249		ug/L		100	70 - 135	4	30
Benzene			50.0	51.1		ug/L		102	80 - 120	1	20
Bromobenzene			50.0	53.1		ug/L		106	80 - 121	1	20
Bromochloromethane			50.0	48.7		ug/L		97	80 - 120	4	20
Bromodichloromethane			50.0	50.4		ug/L		101	80 - 120	2	20
Bromoform			50.0	53.0		ug/L		106	74 - 126	3	20
Bromomethane			50.0	64.7		ug/L		129	62 - 130	10	20
2-Butanone			250	248		ug/L		99	80 - 131	8	20
Carbon disulfide			50.0	50.0		ug/L		100	80 - 120	3	20
Carbon tetrachloride			50.0	52.5		ug/L		105	76 - 123	0	20
Chlorobenzene			50.0	52.7		ug/L		105	80 - 120	1	20
Chloroethane			50.0	59.2		ug/L		118	66 - 135	0	20
2-Chloroethyl vinyl ether			50.0	47.6		ug/L		95	71 - 135	6	50
Chloroform			50.0	49.2		ug/L		98	80 - 120	1	20
Chloromethane			50.0	55.1		ug/L		110	69 - 131	1	30
2-Chlorotoluene			50.0	52.6		ug/L		105	80 - 120	1	20
4-Chlorotoluene			50.0	52.5		ug/L		105	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	52.4		ug/L		105	80 - 120	3	20
cis-1,3-Dichloropropene			50.0	51.5		ug/L		103	80 - 120	4	20
Dibromochloromethane			50.0	51.5		ug/L		103	80 - 121	3	20
1,2-Dibromo-3-Chloropropane			50.0	54.2		ug/L		108	71 - 134	3	20
1,2-Dibromoethane			50.0	48.1		ug/L		96	80 - 120	5	20
Dibromomethane			50.0	49.1		ug/L		98	80 - 120	5	20
1,2-Dichlorobenzene			50.0	49.8		ug/L		100	80 - 120	1	20
1,3-Dichlorobenzene			50.0	50.5		ug/L		101	80 - 120	0	20
1,4-Dichlorobenzene			50.0	50.7		ug/L		101	80 - 120	1	20
Dichlorodifluoromethane			50.0	44.6		ug/L		89	47 - 155	1	40
1,1-Dichloroethane			50.0	51.5		ug/L		103	80 - 120	2	20
1,2-Dichloroethane			50.0	44.4		ug/L		89	80 - 120	5	50
1,1-Dichloroethene			50.0	58.0		ug/L		116	76 - 120	1	20
1,2-Dichloroethene, Total			100	105		ug/L		105	80 - 120	2	20
1,2-Dichloropropane			50.0	52.3		ug/L		105	80 - 120	3	20
1,3-Dichloropropane			50.0	48.6		ug/L		97	80 - 120	5	20
2,2-Dichloropropane			50.0	55.3		ug/L		111	76 - 126	2	20
1,1-Dichloropropene			50.0	50.4		ug/L		101	80 - 120	0	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564389/5
Matrix: Water
Analysis Batch: 564389

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene			50.0	53.4		ug/L		107	80 - 120	2	20
Hexachlorobutadiene			50.0	56.5		ug/L		113	60 - 140	1	20
2-Hexanone			250	236		ug/L		94	74 - 127	7	20
Isopropylbenzene			50.0	54.5		ug/L		109	80 - 120	1	20
Methylene Chloride			50.0	48.6		ug/L		97	80 - 120	3	20
4-Methyl-2-pentanone			250	236		ug/L		94	76 - 124	7	20
Methyl tert-butyl ether			50.0	47.6		ug/L		95	80 - 120	4	20
m-Xylene & p-Xylene			50.0	53.2		ug/L		106	80 - 120	1	20
n-Butylbenzene			50.0	53.0		ug/L		106	80 - 120	1	20
N-Propylbenzene			50.0	53.4		ug/L		107	80 - 120	1	20
o-Xylene			50.0	52.8		ug/L		106	80 - 120	0	30
p-Isopropyltoluene			50.0	53.3		ug/L		107	80 - 120	1	20
sec-Butylbenzene			50.0	53.8		ug/L		108	80 - 120	0	20
Styrene			50.0	53.3		ug/L		107	80 - 120	1	20
tert-Butylbenzene			50.0	53.8		ug/L		108	80 - 121	0	20
1,1,1,2-Tetrachloroethane			50.0	52.7		ug/L		105	80 - 121	1	20
1,1,2,2-Tetrachloroethane			50.0	51.1		ug/L		102	80 - 120	3	20
Tetrachloroethene			50.0	53.5		ug/L		107	80 - 121	1	20
Toluene			50.0	51.4		ug/L		103	80 - 113	2	20
trans-1,2-Dichloroethene			50.0	52.8		ug/L		106	80 - 120	1	20
trans-1,3-Dichloropropene			50.0	47.5		ug/L		95	80 - 120	4	30
1,2,3-Trichlorobenzene			50.0	51.4		ug/L		103	61 - 141	2	20
1,2,4-Trichlorobenzene			50.0	52.7		ug/L		105	68 - 128	1	20
1,1,1-Trichloroethane			50.0	50.9		ug/L		102	80 - 120	0	20
1,1,2-Trichloroethane			50.0	49.8		ug/L		100	80 - 120	5	20
Trichloroethene			50.0	51.9		ug/L		104	80 - 120	0	20
Trichlorofluoromethane			50.0	56.1		ug/L		112	60 - 141	1	20
1,2,3-Trichloropropane			50.0	51.9		ug/L		104	80 - 123	1	30
1,2,4-Trimethylbenzene			50.0	54.1		ug/L		108	80 - 120	1	20
1,3,5-Trimethylbenzene			50.0	53.9		ug/L		108	80 - 120	0	20
Vinyl acetate			100	109		ug/L		109	67 - 135	7	20
Vinyl chloride			50.0	59.0		ug/L		118	71 - 128	1	20
Xylenes, Total			100	106		ug/L		106	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*105*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*
Dibromofluoromethane (Surr)	*97*		*80 - 122*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*

Lab Sample ID: MB 680-564517/8
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/01/19 11:49	1
Benzene	<1.0		1.0	0.43	ug/L			04/01/19 11:49	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/01/19 11:49	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564517/8
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/01/19 11:49	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/01/19 11:49	1
Bromoform	<1.0		1.0	0.43	ug/L			04/01/19 11:49	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
2-Butanone	<10		10	3.4	ug/L			04/01/19 11:49	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/01/19 11:49	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/01/19 11:49	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/01/19 11:49	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/01/19 11:49	1
Chloroform	<1.0		1.0	0.50	ug/L			04/01/19 11:49	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/01/19 11:49	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/01/19 11:49	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/01/19 11:49	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/01/19 11:49	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/01/19 11:49	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/01/19 11:49	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/01/19 11:49	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/01/19 11:49	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/01/19 11:49	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/01/19 11:49	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/01/19 11:49	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/01/19 11:49	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/01/19 11:49	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/01/19 11:49	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/01/19 11:49	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/01/19 11:49	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/01/19 11:49	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/01/19 11:49	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/01/19 11:49	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/01/19 11:49	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/01/19 11:49	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/01/19 11:49	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
2-Hexanone	<10		10	2.0	ug/L			04/01/19 11:49	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/01/19 11:49	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/01/19 11:49	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/01/19 11:49	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/01/19 11:49	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 11:49	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/01/19 11:49	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/01/19 11:49	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/01/19 11:49	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/01/19 11:49	1
Styrene	<1.0		1.0	0.27	ug/L			04/01/19 11:49	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/01/19 11:49	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/01/19 11:49	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/01/19 11:49	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564517/8
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/01/19 11:49	1
Toluene	<1.0		1.0	0.48	ug/L			04/01/19 11:49	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/01/19 11:49	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/01/19 11:49	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 11:49	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/01/19 11:49	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/01/19 11:49	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/01/19 11:49	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/01/19 11:49	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/01/19 11:49	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 11:49	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/01/19 11:49	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/01/19 11:49	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/01/19 11:49	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/01/19 11:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 120*		*04/01/19 11:49*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/01/19 11:49*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 122*		*04/01/19 11:49*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*04/01/19 11:49*	*1*

Lab Sample ID: LCS 680-564517/3
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	295		ug/L		118	70 - 135
Benzene	50.0	51.2		ug/L		102	80 - 120
Bromobenzene	50.0	56.4		ug/L		113	80 - 121
Bromochloromethane	50.0	51.7		ug/L		103	80 - 120
Bromodichloromethane	50.0	53.3		ug/L		107	80 - 120
Bromoform	50.0	56.8		ug/L		114	74 - 126
Bromomethane	50.0	45.2		ug/L		90	62 - 130
2-Butanone	250	269		ug/L		107	80 - 131
Carbon disulfide	50.0	52.0		ug/L		104	80 - 120
Carbon tetrachloride	50.0	50.9		ug/L		102	76 - 123
Chlorobenzene	50.0	52.0		ug/L		104	80 - 120
Chloroethane	50.0	50.7		ug/L		101	66 - 135
2-Chloroethyl vinyl ether	50.0	55.0		ug/L		110	71 - 135
Chloroform	50.0	50.2		ug/L		100	80 - 120
Chloromethane	50.0	55.2		ug/L		110	69 - 131
2-Chlorotoluene	50.0	53.7		ug/L		107	80 - 120
4-Chlorotoluene	50.0	55.2		ug/L		110	80 - 120
cis-1,2-Dichloroethene	50.0	52.4		ug/L		105	80 - 120
cis-1,3-Dichloropropene	50.0	55.4		ug/L		111	80 - 120
Dibromochloromethane	50.0	54.4		ug/L		109	80 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564517/3
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromo-3-Chloropropane	50.0	55.7		ug/L		111	71 - 134
1,2-Dibromoethane	50.0	54.0		ug/L		108	80 - 120
Dibromomethane	50.0	53.1		ug/L		106	80 - 120
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
1,3-Dichlorobenzene	50.0	51.1		ug/L		102	80 - 120
1,4-Dichlorobenzene	50.0	52.5		ug/L		105	80 - 120
Dichlorodifluoromethane	50.0	51.9		ug/L		104	47 - 155
1,1-Dichloroethane	50.0	50.5		ug/L		101	80 - 120
1,2-Dichloroethane	50.0	49.7		ug/L		99	80 - 120
1,1-Dichloroethene	50.0	50.7		ug/L		101	76 - 120
1,2-Dichloroethene, Total	100	104		ug/L		104	80 - 120
1,2-Dichloropropane	50.0	52.1		ug/L		104	80 - 120
1,3-Dichloropropane	50.0	53.4		ug/L		107	80 - 120
2,2-Dichloropropane	50.0	53.6		ug/L		107	76 - 126
1,1-Dichloropropene	50.0	50.9		ug/L		102	80 - 120
Ethylbenzene	50.0	51.4		ug/L		103	80 - 120
Hexachlorobutadiene	50.0	46.0		ug/L		92	60 - 140
2-Hexanone	250	254		ug/L		102	74 - 127
Isopropylbenzene	50.0	57.5		ug/L		115	80 - 120
Methylene Chloride	50.0	52.1		ug/L		104	80 - 120
4-Methyl-2-pentanone	250	253		ug/L		101	76 - 124
Methyl tert-butyl ether	50.0	52.3		ug/L		105	80 - 120
m-Xylene & p-Xylene	50.0	51.9		ug/L		104	80 - 120
n-Butylbenzene	50.0	50.3		ug/L		101	80 - 120
N-Propylbenzene	50.0	59.0		ug/L		118	80 - 120
o-Xylene	50.0	55.6		ug/L		111	80 - 120
p-Isopropyltoluene	50.0	51.9		ug/L		104	80 - 120
sec-Butylbenzene	50.0	59.6		ug/L		119	80 - 120
Styrene	50.0	55.8		ug/L		112	80 - 120
tert-Butylbenzene	50.0	60.0		ug/L		120	80 - 121
1,1,1,2-Tetrachloroethane	50.0	52.4		ug/L		105	80 - 121
1,1,2,2-Tetrachloroethane	50.0	55.6		ug/L		111	80 - 120
Tetrachloroethene	50.0	52.0		ug/L		104	80 - 121
Toluene	50.0	51.3		ug/L		103	80 - 113
trans-1,2-Dichloroethene	50.0	51.8		ug/L		104	80 - 120
trans-1,3-Dichloropropene	50.0	54.0		ug/L		108	80 - 120
1,2,3-Trichlorobenzene	50.0	48.1		ug/L		96	61 - 141
1,2,4-Trichlorobenzene	50.0	49.1		ug/L		98	68 - 128
1,1,1-Trichloroethane	50.0	49.3		ug/L		99	80 - 120
1,1,2-Trichloroethane	50.0	54.0		ug/L		108	80 - 120
Trichloroethene	50.0	52.6		ug/L		105	80 - 120
Trichlorofluoromethane	50.0	52.7		ug/L		105	60 - 141
1,2,3-Trichloropropane	50.0	55.6		ug/L		111	80 - 123
1,2,4-Trimethylbenzene	50.0	60.2		ug/L		120	80 - 120
1,3,5-Trimethylbenzene	50.0	54.2		ug/L		108	80 - 120
Vinyl acetate	100	110		ug/L		110	67 - 135
Vinyl chloride	50.0	52.4		ug/L		105	71 - 128
Xylenes, Total	100	108		ug/L		108	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564517/3
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*
Dibromofluoromethane (Surr)	*100*		*80 - 122*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*

Lab Sample ID: LCSD 680-564517/4
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	265		ug/L		106	70 - 135	10	30
Benzene			50.0	50.0		ug/L		100	80 - 120	2	20
Bromobenzene			50.0	59.6		ug/L		119	80 - 121	6	20
Bromochloromethane			50.0	49.4		ug/L		99	80 - 120	5	20
Bromodichloromethane			50.0	51.3		ug/L		103	80 - 120	4	20
Bromoform			50.0	52.4		ug/L		105	74 - 126	8	20
Bromomethane			50.0	48.3		ug/L		97	62 - 130	7	20
2-Butanone			250	251		ug/L		100	80 - 131	7	20
Carbon disulfide			50.0	51.0		ug/L		102	80 - 120	2	20
Carbon tetrachloride			50.0	50.2		ug/L		100	76 - 123	1	20
Chlorobenzene			50.0	50.8		ug/L		102	80 - 120	2	20
Chloroethane			50.0	50.1		ug/L		100	66 - 135	1	20
2-Chloroethyl vinyl ether			50.0	52.3		ug/L		105	71 - 135	5	50
Chloroform			50.0	49.6		ug/L		99	80 - 120	1	20
Chloromethane			50.0	54.9		ug/L		110	69 - 131	1	30
2-Chlorotoluene			50.0	51.9		ug/L		104	80 - 120	4	20
4-Chlorotoluene			50.0	53.7		ug/L		107	80 - 120	3	20
cis-1,2-Dichloroethene			50.0	50.6		ug/L		101	80 - 120	3	20
cis-1,3-Dichloropropene			50.0	53.0		ug/L		106	80 - 120	4	20
Dibromochloromethane			50.0	51.4		ug/L		103	80 - 121	6	20
1,2-Dibromo-3-Chloropropane			50.0	51.0		ug/L		102	71 - 134	9	20
1,2-Dibromoethane			50.0	50.9		ug/L		102	80 - 120	6	20
Dibromomethane			50.0	50.7		ug/L		101	80 - 120	5	20
1,2-Dichlorobenzene			50.0	50.9		ug/L		102	80 - 120	4	20
1,3-Dichlorobenzene			50.0	50.2		ug/L		100	80 - 120	2	20
1,4-Dichlorobenzene			50.0	51.8		ug/L		104	80 - 120	1	20
Dichlorodifluoromethane			50.0	48.5		ug/L		97	47 - 155	7	40
1,1-Dichloroethane			50.0	49.3		ug/L		99	80 - 120	2	20
1,2-Dichloroethane			50.0	47.2		ug/L		94	80 - 120	5	50
1,1-Dichloroethene			50.0	50.1		ug/L		100	76 - 120	1	20
1,2-Dichloroethene, Total			100	102		ug/L		102	80 - 120	2	20
1,2-Dichloropropane			50.0	50.7		ug/L		101	80 - 120	3	20
1,3-Dichloropropane			50.0	50.0		ug/L		100	80 - 120	7	20
2,2-Dichloropropane			50.0	51.8		ug/L		104	76 - 126	3	20
1,1-Dichloropropene			50.0	49.6		ug/L		99	80 - 120	3	20
Ethylbenzene			50.0	50.9		ug/L		102	80 - 120	1	20
Hexachlorobutadiene			50.0	44.3		ug/L		89	60 - 140	4	20
2-Hexanone			250	239		ug/L		96	74 - 127	6	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564517/4
Matrix: Water
Analysis Batch: 564517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Isopropylbenzene	50.0	54.4		ug/L		109	80 - 120	6	20
Methylene Chloride	50.0	50.5		ug/L		101	80 - 120	3	20
4-Methyl-2-pentanone	250	237		ug/L		95	76 - 124	6	20
Methyl tert-butyl ether	50.0	49.2		ug/L		98	80 - 120	6	20
m-Xylene & p-Xylene	50.0	51.4		ug/L		103	80 - 120	1	20
n-Butylbenzene	50.0	53.0		ug/L		106	80 - 120	5	20
N-Propylbenzene	50.0	56.1		ug/L		112	80 - 120	5	20
o-Xylene	50.0	52.2		ug/L		104	80 - 120	6	30
p-Isopropyltoluene	50.0	51.2		ug/L		102	80 - 120	1	20
sec-Butylbenzene	50.0	60.3	*	ug/L		121	80 - 120	1	20
Styrene	50.0	51.5		ug/L		103	80 - 120	8	20
tert-Butylbenzene	50.0	52.8		ug/L		106	80 - 121	13	20
1,1,1,2-Tetrachloroethane	50.0	50.9		ug/L		102	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	55.1		ug/L		110	80 - 120	1	20
Tetrachloroethene	50.0	52.5		ug/L		105	80 - 121	1	20
Toluene	50.0	49.8		ug/L		100	80 - 113	3	20
trans-1,2-Dichloroethene	50.0	51.2		ug/L		102	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	51.5		ug/L		103	80 - 120	5	30
1,2,3-Trichlorobenzene	50.0	45.3		ug/L		91	61 - 141	6	20
1,2,4-Trichlorobenzene	50.0	48.4		ug/L		97	68 - 128	1	20
1,1,1-Trichloroethane	50.0	48.7		ug/L		97	80 - 120	1	20
1,1,2-Trichloroethane	50.0	50.5		ug/L		101	80 - 120	7	20
Trichloroethene	50.0	51.8		ug/L		104	80 - 120	2	20
Trichlorofluoromethane	50.0	50.6		ug/L		101	60 - 141	4	20
1,2,3-Trichloropropane	50.0	49.7		ug/L		99	80 - 123	11	30
1,2,4-Trimethylbenzene	50.0	60.1		ug/L		120	80 - 120	0	20
1,3,5-Trimethylbenzene	50.0	53.0		ug/L		106	80 - 120	2	20
Vinyl acetate	100	103		ug/L		103	67 - 135	7	20
Vinyl chloride	50.0	50.3		ug/L		101	71 - 128	4	20
Xylenes, Total	100	104		ug/L		104	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*91*		*73 - 131*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
4-Bromofluorobenzene (Surr)	*87*		*80 - 120*

Lab Sample ID: MB 680-564521/8
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/01/19 12:13	1
Benzene	<1.0		1.0	0.43	ug/L			04/01/19 12:13	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/01/19 12:13	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/01/19 12:13	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/01/19 12:13	1
Bromoform	<1.0		1.0	0.43	ug/L			04/01/19 12:13	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564521/8
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
2-Butanone	<10		10	3.4	ug/L			04/01/19 12:13	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/01/19 12:13	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/01/19 12:13	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/01/19 12:13	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/01/19 12:13	1
Chloroform	<1.0		1.0	0.50	ug/L			04/01/19 12:13	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/01/19 12:13	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/01/19 12:13	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/01/19 12:13	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/01/19 12:13	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/01/19 12:13	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/01/19 12:13	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/01/19 12:13	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/01/19 12:13	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/01/19 12:13	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/01/19 12:13	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/01/19 12:13	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/01/19 12:13	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/01/19 12:13	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/01/19 12:13	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/01/19 12:13	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/01/19 12:13	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/01/19 12:13	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/01/19 12:13	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/01/19 12:13	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/01/19 12:13	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/01/19 12:13	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/01/19 12:13	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
2-Hexanone	<10		10	2.0	ug/L			04/01/19 12:13	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/01/19 12:13	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/01/19 12:13	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/01/19 12:13	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/01/19 12:13	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 12:13	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/01/19 12:13	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/01/19 12:13	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/01/19 12:13	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/01/19 12:13	1
Styrene	<1.0		1.0	0.27	ug/L			04/01/19 12:13	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/01/19 12:13	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/01/19 12:13	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/01/19 12:13	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/01/19 12:13	1
Toluene	<1.0		1.0	0.48	ug/L			04/01/19 12:13	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/01/19 12:13	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564521/8
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/01/19 12:13	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 12:13	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/01/19 12:13	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/01/19 12:13	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/01/19 12:13	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/01/19 12:13	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/01/19 12:13	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 12:13	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/01/19 12:13	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/01/19 12:13	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/01/19 12:13	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/01/19 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/01/19 12:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/01/19 12:13*	*1*
Dibromofluoromethane (Surr)	*92*		*80 - 122*		*04/01/19 12:13*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/01/19 12:13*	*1*

Lab Sample ID: LCS 680-564521/4
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	244		ug/L		97	70 - 135
Benzene	50.0	49.5		ug/L		99	80 - 120
Bromobenzene	50.0	51.6		ug/L		103	80 - 121
Bromochloromethane	50.0	47.8		ug/L		96	80 - 120
Bromodichloromethane	50.0	48.9		ug/L		98	80 - 120
Bromoform	50.0	53.3		ug/L		107	74 - 126
Bromomethane	50.0	73.1	*	ug/L		146	62 - 130
2-Butanone	250	248		ug/L		99	80 - 131
Carbon disulfide	50.0	49.3		ug/L		99	80 - 120
Carbon tetrachloride	50.0	50.2		ug/L		100	76 - 123
Chlorobenzene	50.0	51.8		ug/L		104	80 - 120
Chloroethane	50.0	58.0		ug/L		116	66 - 135
2-Chloroethyl vinyl ether	50.0	47.2		ug/L		94	71 - 135
Chloroform	50.0	47.5		ug/L		95	80 - 120
Chloromethane	50.0	54.7		ug/L		109	69 - 131
2-Chlorotoluene	50.0	51.9		ug/L		104	80 - 120
4-Chlorotoluene	50.0	51.6		ug/L		103	80 - 120
cis-1,2-Dichloroethene	50.0	51.0		ug/L		102	80 - 120
cis-1,3-Dichloropropene	50.0	50.5		ug/L		101	80 - 120
Dibromochloromethane	50.0	50.3		ug/L		101	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	52.8		ug/L		106	71 - 134
1,2-Dibromoethane	50.0	46.6		ug/L		93	80 - 120
Dibromomethane	50.0	47.7		ug/L		95	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564521/4
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
1,3-Dichlorobenzene	50.0	49.7		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	49.9		ug/L		100	80 - 120
Dichlorodifluoromethane	50.0	39.8		ug/L		80	47 - 155
1,1-Dichloroethane	50.0	50.9		ug/L		102	80 - 120
1,2-Dichloroethane	50.0	43.5		ug/L		87	80 - 120
1,1-Dichloroethene	50.0	55.2		ug/L		110	76 - 120
1,2-Dichloroethene, Total	100	103		ug/L		103	80 - 120
1,2-Dichloropropane	50.0	51.2		ug/L		102	80 - 120
1,3-Dichloropropane	50.0	47.2		ug/L		94	80 - 120
2,2-Dichloropropane	50.0	53.8		ug/L		108	76 - 126
1,1-Dichloropropene	50.0	49.1		ug/L		98	80 - 120
Ethylbenzene	50.0	52.1		ug/L		104	80 - 120
Hexachlorobutadiene	50.0	55.3		ug/L		111	60 - 140
2-Hexanone	250	237		ug/L		95	74 - 127
Isopropylbenzene	50.0	52.9		ug/L		106	80 - 120
Methylene Chloride	50.0	47.8		ug/L		96	80 - 120
4-Methyl-2-pentanone	250	234		ug/L		94	76 - 124
Methyl tert-butyl ether	50.0	46.3		ug/L		93	80 - 120
m-Xylene & p-Xylene	50.0	52.0		ug/L		104	80 - 120
n-Butylbenzene	50.0	51.8		ug/L		104	80 - 120
N-Propylbenzene	50.0	52.8		ug/L		106	80 - 120
o-Xylene	50.0	52.0		ug/L		104	80 - 120
p-Isopropyltoluene	50.0	52.9		ug/L		106	80 - 120
sec-Butylbenzene	50.0	52.8		ug/L		106	80 - 120
Styrene	50.0	52.3		ug/L		105	80 - 120
tert-Butylbenzene	50.0	52.5		ug/L		105	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.6		ug/L		103	80 - 121
1,1,2,2-Tetrachloroethane	50.0	49.9		ug/L		100	80 - 120
Tetrachloroethene	50.0	52.1		ug/L		104	80 - 121
Toluene	50.0	49.8		ug/L		100	80 - 113
trans-1,2-Dichloroethene	50.0	52.0		ug/L		104	80 - 120
trans-1,3-Dichloropropene	50.0	46.7		ug/L		93	80 - 120
1,2,3-Trichlorobenzene	50.0	51.1		ug/L		102	61 - 141
1,2,4-Trichlorobenzene	50.0	51.3		ug/L		103	68 - 128
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	80 - 120
1,1,2-Trichloroethane	50.0	48.4		ug/L		97	80 - 120
Trichloroethene	50.0	50.5		ug/L		101	80 - 120
Trichlorofluoromethane	50.0	53.3		ug/L		107	60 - 141
1,2,3-Trichloropropane	50.0	50.1		ug/L		100	80 - 123
1,2,4-Trimethylbenzene	50.0	53.8		ug/L		108	80 - 120
1,3,5-Trimethylbenzene	50.0	52.8		ug/L		106	80 - 120
Vinyl acetate	100	107		ug/L		107	67 - 135
Vinyl chloride	50.0	55.2		ug/L		110	71 - 128
Xylenes, Total	100	104		ug/L		104	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*105*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564521/4
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*

Lab Sample ID: LCSD 680-564521/5
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	258		ug/L		103	70 - 135	6	30
Benzene			50.0	50.7		ug/L		101	80 - 120	2	20
Bromobenzene			50.0	52.3		ug/L		105	80 - 121	2	20
Bromochloromethane			50.0	49.1		ug/L		98	80 - 120	3	20
Bromodichloromethane			50.0	50.1		ug/L		100	80 - 120	2	20
Bromoform			50.0	54.2		ug/L		108	74 - 126	2	20
Bromomethane			50.0	74.7	*	ug/L		149	62 - 130	2	20
2-Butanone			250	262		ug/L		105	80 - 131	5	20
Carbon disulfide			50.0	49.3		ug/L		99	80 - 120	0	20
Carbon tetrachloride			50.0	50.1		ug/L		100	76 - 123	0	20
Chlorobenzene			50.0	51.7		ug/L		103	80 - 120	0	20
Chloroethane			50.0	58.0		ug/L		116	66 - 135	0	20
2-Chloroethyl vinyl ether			50.0	49.6		ug/L		99	71 - 135	5	50
Chloroform			50.0	48.6		ug/L		97	80 - 120	2	20
Chloromethane			50.0	55.1		ug/L		110	69 - 131	1	30
2-Chlorotoluene			50.0	51.6		ug/L		103	80 - 120	1	20
4-Chlorotoluene			50.0	51.5		ug/L		103	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	52.0		ug/L		104	80 - 120	2	20
cis-1,3-Dichloropropene			50.0	51.4		ug/L		103	80 - 120	2	20
Dibromochloromethane			50.0	51.9		ug/L		104	80 - 121	3	20
1,2-Dibromo-3-Chloropropane			50.0	55.4		ug/L		111	71 - 134	5	20
1,2-Dibromoethane			50.0	48.7		ug/L		97	80 - 120	5	20
Dibromomethane			50.0	50.1		ug/L		100	80 - 120	5	20
1,2-Dichlorobenzene			50.0	49.9		ug/L		100	80 - 120	2	20
1,3-Dichlorobenzene			50.0	49.8		ug/L		100	80 - 120	0	20
1,4-Dichlorobenzene			50.0	50.5		ug/L		101	80 - 120	1	20
Dichlorodifluoromethane			50.0	40.4		ug/L		81	47 - 155	1	40
1,1-Dichloroethane			50.0	51.1		ug/L		102	80 - 120	0	20
1,2-Dichloroethane			50.0	44.6		ug/L		89	80 - 120	3	50
1,1-Dichloroethene			50.0	56.2		ug/L		112	76 - 120	2	20
1,2-Dichloroethene, Total			100	104		ug/L		104	80 - 120	1	20
1,2-Dichloropropane			50.0	52.5		ug/L		105	80 - 120	2	20
1,3-Dichloropropane			50.0	48.9		ug/L		98	80 - 120	4	20
2,2-Dichloropropane			50.0	53.5		ug/L		107	76 - 126	1	20
1,1-Dichloropropene			50.0	48.9		ug/L		98	80 - 120	0	20
Ethylbenzene			50.0	51.9		ug/L		104	80 - 120	1	20
Hexachlorobutadiene			50.0	55.0		ug/L		110	60 - 140	0	20
2-Hexanone			250	247		ug/L		99	74 - 127	4	20
Isopropylbenzene			50.0	53.3		ug/L		107	80 - 120	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564521/5
Matrix: Water
Analysis Batch: 564521

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methylene Chloride			50.0	48.8		ug/L		98	80 - 120	2	20
4-Methyl-2-pentanone			250	246		ug/L		98	76 - 124	5	20
Methyl tert-butyl ether			50.0	48.0		ug/L		96	80 - 120	3	20
m-Xylene & p-Xylene			50.0	52.2		ug/L		104	80 - 120	0	20
n-Butylbenzene			50.0	51.9		ug/L		104	80 - 120	0	20
N-Propylbenzene			50.0	52.2		ug/L		104	80 - 120	1	20
o-Xylene			50.0	52.1		ug/L		104	80 - 120	0	30
p-Isopropyltoluene			50.0	52.5		ug/L		105	80 - 120	1	20
sec-Butylbenzene			50.0	52.7		ug/L		105	80 - 120	0	20
Styrene			50.0	52.4		ug/L		105	80 - 120	0	20
tert-Butylbenzene			50.0	52.8		ug/L		106	80 - 121	1	20
1,1,1,2-Tetrachloroethane			50.0	51.0		ug/L		102	80 - 121	1	20
1,1,2,2-Tetrachloroethane			50.0	51.4		ug/L		103	80 - 120	3	20
Tetrachloroethene			50.0	52.2		ug/L		104	80 - 121	0	20
Toluene			50.0	50.4		ug/L		101	80 - 113	1	20
trans-1,2-Dichloroethene			50.0	51.7		ug/L		103	80 - 120	1	20
trans-1,3-Dichloropropene			50.0	47.9		ug/L		96	80 - 120	3	30
1,2,3-Trichlorobenzene			50.0	52.1		ug/L		104	61 - 141	2	20
1,2,4-Trichlorobenzene			50.0	53.1		ug/L		106	68 - 128	3	20
1,1,1-Trichloroethane			50.0	49.7		ug/L		99	80 - 120	0	20
1,1,2-Trichloroethane			50.0	50.7		ug/L		101	80 - 120	5	20
Trichloroethene			50.0	50.6		ug/L		101	80 - 120	0	20
Trichlorofluoromethane			50.0	53.6		ug/L		107	60 - 141	1	20
1,2,3-Trichloropropane			50.0	51.6		ug/L		103	80 - 123	3	30
1,2,4-Trimethylbenzene			50.0	53.8		ug/L		108	80 - 120	0	20
1,3,5-Trimethylbenzene			50.0	52.6		ug/L		105	80 - 120	0	20
Vinyl acetate			100	112		ug/L		112	67 - 135	4	20
Vinyl chloride			50.0	55.6		ug/L		111	71 - 128	1	20
Xylenes, Total			100	104		ug/L		104	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*

Lab Sample ID: MB 680-564619/10
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/01/19 23:20	1
Benzene	<1.0		1.0	0.43	ug/L			04/01/19 23:20	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/01/19 23:20	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/01/19 23:20	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/01/19 23:20	1
Bromoform	<1.0		1.0	0.43	ug/L			04/01/19 23:20	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564619/10
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone	<10		10	3.4	ug/L			04/01/19 23:20	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/01/19 23:20	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/01/19 23:20	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/01/19 23:20	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/01/19 23:20	1
Chloroform	<1.0		1.0	0.50	ug/L			04/01/19 23:20	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/01/19 23:20	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/01/19 23:20	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/01/19 23:20	1
cis-1,2-Dichloroethene	0.482	J	1.0	0.41	ug/L			04/01/19 23:20	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/01/19 23:20	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/01/19 23:20	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/01/19 23:20	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/01/19 23:20	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/01/19 23:20	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/01/19 23:20	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/01/19 23:20	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/01/19 23:20	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/01/19 23:20	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/01/19 23:20	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/01/19 23:20	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/01/19 23:20	1
1,2-Dichloroethene, Total	0.482	J	2.0	0.37	ug/L			04/01/19 23:20	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/01/19 23:20	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/01/19 23:20	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/01/19 23:20	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/01/19 23:20	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/01/19 23:20	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1
2-Hexanone	<10		10	2.0	ug/L			04/01/19 23:20	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/01/19 23:20	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/01/19 23:20	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/01/19 23:20	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/01/19 23:20	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 23:20	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/01/19 23:20	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/01/19 23:20	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/01/19 23:20	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/01/19 23:20	1
Styrene	<1.0		1.0	0.27	ug/L			04/01/19 23:20	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/01/19 23:20	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/01/19 23:20	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/01/19 23:20	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/01/19 23:20	1
Toluene	<1.0		1.0	0.48	ug/L			04/01/19 23:20	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/01/19 23:20	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/01/19 23:20	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564619/10
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 23:20	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/01/19 23:20	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/01/19 23:20	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/01/19 23:20	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/01/19 23:20	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/01/19 23:20	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 23:20	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/01/19 23:20	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/01/19 23:20	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/01/19 23:20	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/01/19 23:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/01/19 23:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/01/19 23:20*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 122*		*04/01/19 23:20*	*1*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*04/01/19 23:20*	*1*

Lab Sample ID: LCS 680-564619/4
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	267		ug/L		107	70 - 135
Benzene	50.0	50.7		ug/L		101	80 - 120
Bromobenzene	50.0	47.8		ug/L		96	80 - 121
Bromochloromethane	50.0	43.7		ug/L		87	80 - 120
Bromodichloromethane	50.0	51.9		ug/L		104	80 - 120
Bromoform	50.0	51.4		ug/L		103	74 - 126
Bromomethane	50.0	50.3		ug/L		101	62 - 130
2-Butanone	250	241		ug/L		97	80 - 131
Carbon disulfide	50.0	51.4		ug/L		103	80 - 120
Carbon tetrachloride	50.0	50.2		ug/L		100	76 - 123
Chlorobenzene	50.0	50.4		ug/L		101	80 - 120
Chloroethane	50.0	51.3		ug/L		103	66 - 135
2-Chloroethyl vinyl ether	50.0	52.8		ug/L		106	71 - 135
Chloroform	50.0	49.8		ug/L		100	80 - 120
Chloromethane	50.0	55.3		ug/L		111	69 - 131
2-Chlorotoluene	50.0	45.0		ug/L		90	80 - 120
4-Chlorotoluene	50.0	45.5		ug/L		91	80 - 120
cis-1,2-Dichloroethene	50.0	51.9		ug/L		104	80 - 120
cis-1,3-Dichloropropene	50.0	52.1		ug/L		104	80 - 120
Dibromochloromethane	50.0	63.1	*	ug/L		126	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	52.3		ug/L		105	71 - 134
1,2-Dibromoethane	50.0	62.3	*	ug/L		125	80 - 120
Dibromomethane	50.0	51.8		ug/L		104	80 - 120
1,2-Dichlorobenzene	50.0	51.7		ug/L		103	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564619/4
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,3-Dichlorobenzene	50.0	50.6		ug/L		101	80 - 120
1,4-Dichlorobenzene	50.0	52.5		ug/L		105	80 - 120
Dichlorodifluoromethane	50.0	48.9		ug/L		98	47 - 155
1,1-Dichloroethane	50.0	49.8		ug/L		100	80 - 120
1,2-Dichloroethane	50.0	47.7		ug/L		95	80 - 120
1,1-Dichloroethene	50.0	50.9		ug/L		102	76 - 120
1,2-Dichloroethene, Total	100	102		ug/L		102	80 - 120
1,2-Dichloropropane	50.0	50.7		ug/L		101	80 - 120
1,3-Dichloropropane	50.0	58.5		ug/L		117	80 - 120
2,2-Dichloropropane	50.0	48.2		ug/L		96	76 - 126
1,1-Dichloropropene	50.0	49.5		ug/L		99	80 - 120
Ethylbenzene	50.0	50.2		ug/L		100	80 - 120
Hexachlorobutadiene	50.0	52.8		ug/L		106	60 - 140
2-Hexanone	250	277		ug/L		111	74 - 127
Isopropylbenzene	50.0	47.7		ug/L		95	80 - 120
Methylene Chloride	50.0	51.2		ug/L		102	80 - 120
4-Methyl-2-pentanone	250	238		ug/L		95	76 - 124
Methyl tert-butyl ether	50.0	50.5		ug/L		101	80 - 120
m-Xylene & p-Xylene	50.0	50.7		ug/L		101	80 - 120
n-Butylbenzene	50.0	53.0		ug/L		106	80 - 120
N-Propylbenzene	50.0	46.5		ug/L		93	80 - 120
o-Xylene	50.0	50.4		ug/L		101	80 - 120
p-Isopropyltoluene	50.0	51.8		ug/L		104	80 - 120
sec-Butylbenzene	50.0	44.7		ug/L		89	80 - 120
Styrene	50.0	50.3		ug/L		101	80 - 120
tert-Butylbenzene	50.0	44.9		ug/L		90	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.1		ug/L		102	80 - 121
1,1,2,2-Tetrachloroethane	50.0	45.7		ug/L		91	80 - 120
Tetrachloroethene	50.0	53.6		ug/L		107	80 - 121
Toluene	50.0	50.1		ug/L		100	80 - 113
trans-1,2-Dichloroethene	50.0	50.6		ug/L		101	80 - 120
trans-1,3-Dichloropropene	50.0	55.1		ug/L		110	80 - 120
1,2,3-Trichlorobenzene	50.0	54.7		ug/L		109	61 - 141
1,2,4-Trichlorobenzene	50.0	54.5		ug/L		109	68 - 128
1,1,1-Trichloroethane	50.0	49.3		ug/L		99	80 - 120
1,1,2-Trichloroethane	50.0	55.0		ug/L		110	80 - 120
Trichloroethene	50.0	52.8		ug/L		106	80 - 120
Trichlorofluoromethane	50.0	52.2		ug/L		104	60 - 141
1,2,3-Trichloropropane	50.0	43.9		ug/L		88	80 - 123
1,2,4-Trimethylbenzene	50.0	44.5		ug/L		89	80 - 120
1,3,5-Trimethylbenzene	50.0	44.9		ug/L		90	80 - 120
Vinyl acetate	100	96.9		ug/L		97	67 - 135
Vinyl chloride	50.0	51.9		ug/L		104	71 - 128
Xylenes, Total	100	101		ug/L		101	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*92*		*73 - 131*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564619/4
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*

Lab Sample ID: LCSD 680-564619/5
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	264		ug/L		106	70 - 135	1	30
Benzene			50.0	49.0		ug/L		98	80 - 120	3	20
Bromobenzene			50.0	50.5		ug/L		101	80 - 121	5	20
Bromochloromethane			50.0	51.5		ug/L		103	80 - 120	17	20
Bromodichloromethane			50.0	50.5		ug/L		101	80 - 120	3	20
Bromoform			50.0	50.3		ug/L		101	74 - 126	2	20
Bromomethane			50.0	52.7		ug/L		105	62 - 130	5	20
2-Butanone			250	253		ug/L		101	80 - 131	5	20
Carbon disulfide			50.0	50.6		ug/L		101	80 - 120	1	20
Carbon tetrachloride			50.0	50.1		ug/L		100	76 - 123	0	20
Chlorobenzene			50.0	49.5		ug/L		99	80 - 120	2	20
Chloroethane			50.0	55.2		ug/L		110	66 - 135	7	20
2-Chloroethyl vinyl ether			50.0	54.7		ug/L		109	71 - 135	4	50
Chloroform			50.0	50.7		ug/L		101	80 - 120	2	20
Chloromethane			50.0	57.7		ug/L		115	69 - 131	4	30
2-Chlorotoluene			50.0	48.3		ug/L		97	80 - 120	7	20
4-Chlorotoluene			50.0	49.9		ug/L		100	80 - 120	9	20
cis-1,2-Dichloroethene			50.0	52.1		ug/L		104	80 - 120	0	20
cis-1,3-Dichloropropene			50.0	54.2		ug/L		108	80 - 120	4	20
Dibromochloromethane			50.0	55.3		ug/L		111	80 - 121	13	20
1,2-Dibromo-3-Chloropropane			50.0	51.7		ug/L		103	71 - 134	1	20
1,2-Dibromoethane			50.0	54.9		ug/L		110	80 - 120	13	20
Dibromomethane			50.0	51.0		ug/L		102	80 - 120	2	20
1,2-Dichlorobenzene			50.0	50.4		ug/L		101	80 - 120	3	20
1,3-Dichlorobenzene			50.0	48.7		ug/L		97	80 - 120	4	20
1,4-Dichlorobenzene			50.0	50.2		ug/L		100	80 - 120	4	20
Dichlorodifluoromethane			50.0	45.6		ug/L		91	47 - 155	7	40
1,1-Dichloroethane			50.0	48.8		ug/L		98	80 - 120	2	20
1,2-Dichloroethane			50.0	46.6		ug/L		93	80 - 120	2	50
1,1-Dichloroethene			50.0	48.7		ug/L		97	76 - 120	4	20
1,2-Dichloroethene, Total			100	102		ug/L		102	80 - 120	0	20
1,2-Dichloropropane			50.0	49.2		ug/L		98	80 - 120	3	20
1,3-Dichloropropane			50.0	53.8		ug/L		108	80 - 120	8	20
2,2-Dichloropropane			50.0	48.5		ug/L		97	76 - 126	1	20
1,1-Dichloropropene			50.0	48.7		ug/L		97	80 - 120	2	20
Ethylbenzene			50.0	49.8		ug/L		100	80 - 120	1	20
Hexachlorobutadiene			50.0	49.8		ug/L		100	60 - 140	6	20
2-Hexanone			250	255		ug/L		102	74 - 127	8	20
Isopropylbenzene			50.0	49.8		ug/L		100	80 - 120	4	20
Methylene Chloride			50.0	49.2		ug/L		98	80 - 120	4	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-564619/5
Matrix: Water
Analysis Batch: 564619

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4-Methyl-2-pentanone	250	252		ug/L		101	76 - 124	6	20
Methyl tert-butyl ether	50.0	49.0		ug/L		98	80 - 120	3	20
m-Xylene & p-Xylene	50.0	50.1		ug/L		100	80 - 120	1	20
n-Butylbenzene	50.0	51.5		ug/L		103	80 - 120	3	20
N-Propylbenzene	50.0	50.5		ug/L		101	80 - 120	8	20
o-Xylene	50.0	51.1		ug/L		102	80 - 120	1	30
p-Isopropyltoluene	50.0	50.3		ug/L		101	80 - 120	3	20
sec-Butylbenzene	50.0	51.5		ug/L		103	80 - 120	14	20
Styrene	50.0	50.6		ug/L		101	80 - 120	1	20
tert-Butylbenzene	50.0	51.4		ug/L		103	80 - 121	14	20
1,1,1,2-Tetrachloroethane	50.0	49.5		ug/L		99	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	48.4		ug/L		97	80 - 120	6	20
Tetrachloroethene	50.0	54.9		ug/L		110	80 - 121	2	20
Toluene	50.0	52.2		ug/L		104	80 - 113	4	20
trans-1,2-Dichloroethene	50.0	50.1		ug/L		100	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	51.6		ug/L		103	80 - 120	7	30
1,2,3-Trichlorobenzene	50.0	52.4		ug/L		105	61 - 141	4	20
1,2,4-Trichlorobenzene	50.0	53.3		ug/L		107	68 - 128	2	20
1,1,1-Trichloroethane	50.0	50.0		ug/L		100	80 - 120	1	20
1,1,2-Trichloroethane	50.0	54.0		ug/L		108	80 - 120	2	20
Trichloroethene	50.0	51.2		ug/L		102	80 - 120	3	20
Trichlorofluoromethane	50.0	53.2		ug/L		106	60 - 141	2	20
1,2,3-Trichloropropane	50.0	48.4		ug/L		97	80 - 123	10	30
1,2,4-Trimethylbenzene	50.0	51.5		ug/L		103	80 - 120	15	20
1,3,5-Trimethylbenzene	50.0	48.9		ug/L		98	80 - 120	8	20
Vinyl acetate	100	95.3		ug/L		95	67 - 135	2	20
Vinyl chloride	50.0	52.3		ug/L		105	71 - 128	1	20
Xylenes, Total	100	101		ug/L		101	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*

Lab Sample ID: MB 680-565029/8
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 10:53	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 10:53	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 10:53	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565029/8
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 10:53	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 10:53	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 10:53	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 10:53	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 10:53	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 10:53	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 10:53	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 10:53	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 10:53	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 10:53	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 10:53	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 10:53	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 10:53	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 10:53	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 10:53	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 10:53	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 10:53	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 10:53	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 10:53	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 10:53	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 10:53	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 10:53	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 10:53	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 10:53	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 10:53	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 10:53	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 10:53	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565029/8
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 10:53	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 10:53	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 10:53	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 10:53	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 10:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 10:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 10:53*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 10:53*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/04/19 10:53*	*1*

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	265		ug/L		106	70 - 135
Benzene	50.0	50.2		ug/L		100	80 - 120
Bromobenzene	50.0	52.5		ug/L		105	80 - 121
Bromochloromethane	50.0	50.4		ug/L		101	80 - 120
Bromodichloromethane	50.0	49.2		ug/L		98	80 - 120
Bromoform	50.0	53.6		ug/L		107	74 - 126
Bromomethane	50.0	76.7	*	ug/L		153	62 - 130
2-Butanone	250	262		ug/L		105	80 - 131
Carbon disulfide	50.0	48.2		ug/L		96	80 - 120
Carbon tetrachloride	50.0	49.6		ug/L		99	76 - 123
Chlorobenzene	50.0	51.8		ug/L		104	80 - 120
Chloroethane	50.0	57.9		ug/L		116	66 - 135
2-Chloroethyl vinyl ether	50.0	49.4		ug/L		99	71 - 135
Chloroform	50.0	47.9		ug/L		96	80 - 120
Chloromethane	50.0	58.2		ug/L		116	69 - 131
2-Chlorotoluene	50.0	51.1		ug/L		102	80 - 120
4-Chlorotoluene	50.0	51.4		ug/L		103	80 - 120
cis-1,2-Dichloroethene	50.0	49.4		ug/L		99	80 - 120
cis-1,3-Dichloropropene	50.0	51.3		ug/L		103	80 - 120
Dibromochloromethane	50.0	51.4		ug/L		103	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	52.4		ug/L		105	71 - 134
1,2-Dibromoethane	50.0	49.3		ug/L		99	80 - 120
Dibromomethane	50.0	49.5		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	49.7		ug/L		99	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	50.0	49.6		ug/L		99	80 - 120
Dichlorodifluoromethane	50.0	49.7		ug/L		99	47 - 155
1,1-Dichloroethane	50.0	50.3		ug/L		101	80 - 120
1,2-Dichloroethane	50.0	44.2		ug/L		88	80 - 120
1,1-Dichloroethene	50.0	54.3		ug/L		109	76 - 120
1,2-Dichloroethene, Total	100	99.0		ug/L		99	80 - 120
1,2-Dichloropropane	50.0	51.4		ug/L		103	80 - 120
1,3-Dichloropropane	50.0	50.8		ug/L		102	80 - 120
2,2-Dichloropropane	50.0	51.8		ug/L		104	76 - 126
1,1-Dichloropropene	50.0	49.2		ug/L		98	80 - 120
Ethylbenzene	50.0	51.4		ug/L		103	80 - 120
Hexachlorobutadiene	50.0	50.4		ug/L		101	60 - 140
2-Hexanone	250	246		ug/L		99	74 - 127
Isopropylbenzene	50.0	52.3		ug/L		105	80 - 120
Methylene Chloride	50.0	48.0		ug/L		96	80 - 120
4-Methyl-2-pentanone	250	244		ug/L		98	76 - 124
Methyl tert-butyl ether	50.0	47.9		ug/L		96	80 - 120
m-Xylene & p-Xylene	50.0	51.2		ug/L		102	80 - 120
n-Butylbenzene	50.0	51.0		ug/L		102	80 - 120
N-Propylbenzene	50.0	52.5		ug/L		105	80 - 120
o-Xylene	50.0	51.6		ug/L		103	80 - 120
p-Isopropyltoluene	50.0	51.4		ug/L		103	80 - 120
sec-Butylbenzene	50.0	51.7		ug/L		103	80 - 120
Styrene	50.0	52.3		ug/L		105	80 - 120
tert-Butylbenzene	50.0	52.6		ug/L		105	80 - 121
1,1,1,2-Tetrachloroethane	50.0	52.2		ug/L		104	80 - 121
1,1,2,2-Tetrachloroethane	50.0	51.6		ug/L		103	80 - 120
Tetrachloroethene	50.0	52.3		ug/L		105	80 - 121
Toluene	50.0	50.7		ug/L		101	80 - 113
trans-1,2-Dichloroethene	50.0	49.6		ug/L		99	80 - 120
trans-1,3-Dichloropropene	50.0	51.0		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	49.0		ug/L		98	61 - 141
1,2,4-Trichlorobenzene	50.0	49.7		ug/L		99	68 - 128
1,1,1-Trichloroethane	50.0	47.5		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	51.2		ug/L		102	80 - 120
Trichloroethene	50.0	50.4		ug/L		101	80 - 120
Trichlorofluoromethane	50.0	53.8		ug/L		108	60 - 141
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 123
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120
1,3,5-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120
Vinyl acetate	100	114		ug/L		114	67 - 135
Vinyl chloride	50.0	57.1		ug/L		114	71 - 128
Xylenes, Total	100	103		ug/L		103	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*

Lab Sample ID: LCSD 680-565029/5
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	256		ug/L		102	70 - 135	3	30
Benzene			50.0	50.5		ug/L		101	80 - 120	1	20
Bromobenzene			50.0	51.7		ug/L		103	80 - 121	2	20
Bromochloromethane			50.0	49.5		ug/L		99	80 - 120	2	20
Bromodichloromethane			50.0	48.1		ug/L		96	80 - 120	2	20
Bromoform			50.0	51.5		ug/L		103	74 - 126	4	20
Bromomethane			50.0	73.3	*	ug/L		147	62 - 130	4	20
2-Butanone			250	249		ug/L		100	80 - 131	5	20
Carbon disulfide			50.0	49.6		ug/L		99	80 - 120	3	20
Carbon tetrachloride			50.0	51.0		ug/L		102	76 - 123	3	20
Chlorobenzene			50.0	50.6		ug/L		101	80 - 120	2	20
Chloroethane			50.0	58.4		ug/L		117	66 - 135	1	20
2-Chloroethyl vinyl ether			50.0	47.5		ug/L		95	71 - 135	4	50
Chloroform			50.0	47.8		ug/L		96	80 - 120	0	20
Chloromethane			50.0	59.1		ug/L		118	69 - 131	1	30
2-Chlorotoluene			50.0	51.3		ug/L		103	80 - 120	0	20
4-Chlorotoluene			50.0	50.7		ug/L		101	80 - 120	1	20
cis-1,2-Dichloroethene			50.0	49.9		ug/L		100	80 - 120	1	20
cis-1,3-Dichloropropene			50.0	50.4		ug/L		101	80 - 120	2	20
Dibromochloromethane			50.0	50.0		ug/L		100	80 - 121	3	20
1,2-Dibromo-3-Chloropropane			50.0	49.4		ug/L		99	71 - 134	6	20
1,2-Dibromoethane			50.0	48.2		ug/L		96	80 - 120	2	20
Dibromomethane			50.0	48.2		ug/L		96	80 - 120	3	20
1,2-Dichlorobenzene			50.0	49.3		ug/L		99	80 - 120	2	20
1,3-Dichlorobenzene			50.0	48.6		ug/L		97	80 - 120	2	20
1,4-Dichlorobenzene			50.0	48.9		ug/L		98	80 - 120	2	20
Dichlorodifluoromethane			50.0	50.9		ug/L		102	47 - 155	2	40
1,1-Dichloroethane			50.0	51.1		ug/L		102	80 - 120	1	20
1,2-Dichloroethane			50.0	43.5		ug/L		87	80 - 120	2	50
1,1-Dichloroethene			50.0	55.7		ug/L		111	76 - 120	3	20
1,2-Dichloroethene, Total			100	99.9		ug/L		100	80 - 120	1	20
1,2-Dichloropropane			50.0	50.6		ug/L		101	80 - 120	2	20
1,3-Dichloropropane			50.0	48.8		ug/L		98	80 - 120	4	20
2,2-Dichloropropane			50.0	52.9		ug/L		106	76 - 126	2	20
1,1-Dichloropropene			50.0	50.9		ug/L		102	80 - 120	3	20
Ethylbenzene			50.0	51.3		ug/L		103	80 - 120	0	20
Hexachlorobutadiene			50.0	52.7		ug/L		105	60 - 140	5	20
2-Hexanone			250	233		ug/L		93	74 - 127	6	20
Isopropylbenzene			50.0	51.7		ug/L		103	80 - 120	1	20
Methylene Chloride			50.0	48.1		ug/L		96	80 - 120	0	20
4-Methyl-2-pentanone			250	230		ug/L		92	76 - 124	6	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565029/5
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether	50.0	46.6		ug/L		93	80 - 120	3	20
m-Xylene & p-Xylene	50.0	51.5		ug/L		103	80 - 120	1	20
n-Butylbenzene	50.0	50.9		ug/L		102	80 - 120	0	20
N-Propylbenzene	50.0	52.2		ug/L		104	80 - 120	1	20
o-Xylene	50.0	51.2		ug/L		102	80 - 120	1	30
p-Isopropyltoluene	50.0	52.0		ug/L		104	80 - 120	1	20
sec-Butylbenzene	50.0	52.4		ug/L		105	80 - 120	1	20
Styrene	50.0	51.7		ug/L		103	80 - 120	1	20
tert-Butylbenzene	50.0	52.5		ug/L		105	80 - 121	0	20
1,1,1,2-Tetrachloroethane	50.0	50.9		ug/L		102	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	49.1		ug/L		98	80 - 120	5	20
Tetrachloroethene	50.0	52.6		ug/L		105	80 - 121	1	20
Toluene	50.0	50.6		ug/L		101	80 - 113	0	20
trans-1,2-Dichloroethene	50.0	50.0		ug/L		100	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	49.2		ug/L		98	80 - 120	4	30
1,2,3-Trichlorobenzene	50.0	48.8		ug/L		98	61 - 141	0	20
1,2,4-Trichlorobenzene	50.0	49.9		ug/L		100	68 - 128	0	20
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	80 - 120	4	20
1,1,2-Trichloroethane	50.0	49.4		ug/L		99	80 - 120	4	20
Trichloroethene	50.0	50.6		ug/L		101	80 - 120	0	20
Trichlorofluoromethane	50.0	55.3		ug/L		111	60 - 141	3	20
1,2,3-Trichloropropane	50.0	49.1		ug/L		98	80 - 123	5	30
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120	0	20
1,3,5-Trimethylbenzene	50.0	52.0		ug/L		104	80 - 120	1	20
Vinyl acetate	100	112		ug/L		112	67 - 135	2	20
Vinyl chloride	50.0	58.6		ug/L		117	71 - 128	3	20
Xylenes, Total	100	103		ug/L		103	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*
Dibromofluoromethane (Surr)	*95*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-564109/19-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564109

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:17	1
Acenaphthylene	<10		10	0.85	ug/L		03/28/19 16:10	03/29/19 15:17	1
Acetophenone	<10		10	0.57	ug/L		03/28/19 16:10	03/29/19 15:17	1
Anthracene	<10		10	0.69	ug/L		03/28/19 16:10	03/29/19 15:17	1
Atrazine	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
Benzaldehyde	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:17	1
Benzo[a]anthracene	<10		10	0.55	ug/L		03/28/19 16:10	03/29/19 15:17	1
Benzo[a]pyrene	<10		10	0.71	ug/L		03/28/19 16:10	03/29/19 15:17	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564109/19-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564109

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[b]fluoranthene	<10		10	2.6	ug/L		03/28/19 16:10	03/29/19 15:17	1
Benzo[g,h,i]perylene	<10		10	0.87	ug/L		03/28/19 16:10	03/29/19 15:17	1
Benzo[k]fluoranthene	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
1,1'-Biphenyl	<10		10	0.58	ug/L		03/28/19 16:10	03/29/19 15:17	1
Bis(2-chloroethoxy)methane	<10		10	0.94	ug/L		03/28/19 16:10	03/29/19 15:17	1
Bis(2-chloroethyl)ether	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:17	1
bis (2-chloroisopropyl) ether	<10		10	0.78	ug/L		03/28/19 16:10	03/29/19 15:17	1
Bis(2-ethylhexyl) phthalate	<10		10	1.6	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Bromophenyl phenyl ether	<10		10	0.77	ug/L		03/28/19 16:10	03/29/19 15:17	1
Butyl benzyl phthalate	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
Caprolactam	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:17	1
Carbazole	<10		10	0.71	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Chloroaniline	<20		20	2.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Chloro-3-methylphenol	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
2-Chloronaphthalene	<10		10	0.80	ug/L		03/28/19 16:10	03/29/19 15:17	1
2-Chlorophenol	<10		10	0.87	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Chlorophenyl phenyl ether	<10		10	0.84	ug/L		03/28/19 16:10	03/29/19 15:17	1
Chrysene	<10		10	0.51	ug/L		03/28/19 16:10	03/29/19 15:17	1
Dibenz(a,h)anthracene	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
Dibenzofuran	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:17	1
1,2-Dichlorobenzene	<10		10	0.53	ug/L		03/28/19 16:10	03/29/19 15:17	1
1,3-Dichlorobenzene	<10		10	0.59	ug/L		03/28/19 16:10	03/29/19 15:17	1
1,4-Dichlorobenzene	<10		10	0.54	ug/L		03/28/19 16:10	03/29/19 15:17	1
3,3'-Dichlorobenzidine	<60		60	30	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4-Dichlorophenol	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:17	1
Diethyl phthalate	<10		10	0.88	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4-Dimethylphenol	<10		10	4.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
Dimethyl phthalate	<10		10	0.99	ug/L		03/28/19 16:10	03/29/19 15:17	1
Di-n-butyl phthalate	<10		10	0.83	ug/L		03/28/19 16:10	03/29/19 15:17	1
4,6-Dinitro-2-methylphenol	<50		50	10	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4-Dinitrophenol	<50		50	10	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4-Dinitrotoluene	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,6-Dinitrotoluene	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:17	1
Di-n-octyl phthalate	<10		10	1.4	ug/L		03/28/19 16:10	03/29/19 15:17	1
Fluoranthene	<10		10	0.74	ug/L		03/28/19 16:10	03/29/19 15:17	1
Fluorene	<10		10	0.96	ug/L		03/28/19 16:10	03/29/19 15:17	1
Hexachlorobenzene	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:17	1
Hexachlorobutadiene	<10		10	0.62	ug/L		03/28/19 16:10	03/29/19 15:17	1
Hexachlorocyclopentadiene	<10		10	2.5	ug/L		03/28/19 16:10	03/29/19 15:17	1
Hexachloroethane	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:17	1
Indeno[1,2,3-cd]pyrene	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
Isophorone	<10		10	0.90	ug/L		03/28/19 16:10	03/29/19 15:17	1
2-Methylnaphthalene	<10		10	0.78	ug/L		03/28/19 16:10	03/29/19 15:17	1
2-Methylphenol	<10		10	0.89	ug/L		03/28/19 16:10	03/29/19 15:17	1
3 & 4 Methylphenol	<10		10	1.3	ug/L		03/28/19 16:10	03/29/19 15:17	1
2-Nitroaniline	<50		50	1.3	ug/L		03/28/19 16:10	03/29/19 15:17	1
3-Nitroaniline	<50		50	5.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Nitroaniline	<50		50	5.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
Nitrobenzene	<10		10	0.73	ug/L		03/28/19 16:10	03/29/19 15:17	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564109/19-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564109

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Nitrophenol	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:17	1
4-Nitrophenol	<50		50	1.9	ug/L		03/28/19 16:10	03/29/19 15:17	1
N-Nitrosodi-n-propylamine	<10		10	0.72	ug/L		03/28/19 16:10	03/29/19 15:17	1
N-Nitrosodiphenylamine	<10		10	0.92	ug/L		03/28/19 16:10	03/29/19 15:17	1
Pentachlorophenol	<50		50	2.0	ug/L		03/28/19 16:10	03/29/19 15:17	1
Phenanthrene	<10		10	0.77	ug/L		03/28/19 16:10	03/29/19 15:17	1
Phenol	<10		10	0.83	ug/L		03/28/19 16:10	03/29/19 15:17	1
Pyrene	<10		10	0.63	ug/L		03/28/19 16:10	03/29/19 15:17	1
1,2,4-Trichlorobenzene	<10		10	0.56	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4,5-Trichlorophenol	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:17	1
2,4,6-Trichlorophenol	<10		10	0.85	ug/L		03/28/19 16:10	03/29/19 15:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*48*		*32 - 113*	*03/28/19 16:10*	*03/29/19 15:17*	*1*
2-Fluorophenol	*64*		*26 - 109*	*03/28/19 16:10*	*03/29/19 15:17*	*1*
Nitrobenzene-d5	*72*		*32 - 118*	*03/28/19 16:10*	*03/29/19 15:17*	*1*
Phenol-d5	*69*		*27 - 110*	*03/28/19 16:10*	*03/29/19 15:17*	*1*
Terphenyl-d14	*64*		*10 - 126*	*03/28/19 16:10*	*03/29/19 15:17*	*1*
2,4,6-Tribromophenol	*80*		*39 - 124*	*03/28/19 16:10*	*03/29/19 15:17*	*1*

Lab Sample ID: LCS 680-564109/20-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564109

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	100	62.3		ug/L		62	48 - 130
Acenaphthylene	100	68.4		ug/L		68	48 - 130
Anthracene	100	77.4		ug/L		77	49 - 130
Atrazine	100	81.3		ug/L		81	39 - 130
Benzaldehyde	100	34.8		ug/L		35	14 - 130
Benzo[a]anthracene	100	77.8		ug/L		78	44 - 130
Benzo[a]pyrene	100	74.2		ug/L		74	44 - 130
Benzo[b]fluoranthene	100	78.1		ug/L		78	43 - 130
Benzo[g,h,i]perylene	100	79.0		ug/L		79	41 - 130
Benzo[k]fluoranthene	100	78.6		ug/L		79	40 - 130
1,1'-Biphenyl	100	66.9		ug/L		67	45 - 130
Bis(2-chloroethoxy)methane	100	66.4		ug/L		66	47 - 130
Bis(2-chloroethyl)ether	100	64.3		ug/L		64	32 - 130
bis (2-chloroisopropyl) ether	100	59.2		ug/L		59	26 - 130
Bis(2-ethylhexyl) phthalate	100	81.1		ug/L		81	45 - 130
4-Bromophenyl phenyl ether	100	70.9		ug/L		71	47 - 130
Butyl benzyl phthalate	100	78.7		ug/L		79	50 - 130
Caprolactam	100	60.5		ug/L		60	26 - 130
Carbazole	100	83.5		ug/L		83	54 - 130
4-Chloroaniline	100	54.7		ug/L		55	42 - 130
4-Chloro-3-methylphenol	100	73.0		ug/L		73	47 - 130
2-Chloronaphthalene	100	65.2		ug/L		65	44 - 130
2-Chlorophenol	100	68.6		ug/L		69	39 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564109/20-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564109

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorophenyl phenyl ether	100	69.4		ug/L		69	45 - 130
Chrysene	100	79.6		ug/L		80	47 - 130
Dibenz(a,h)anthracene	100	81.5		ug/L		82	41 - 130
Dibenzofuran	100	70.6		ug/L		71	50 - 130
1,2-Dichlorobenzene	100	58.5		ug/L		58	31 - 130
1,3-Dichlorobenzene	100	60.8		ug/L		61	30 - 130
1,4-Dichlorobenzene	100	58.7		ug/L		59	31 - 130
3,3'-Dichlorobenzidine	100	82.9		ug/L		83	46 - 130
2,4-Dichlorophenol	100	67.4		ug/L		67	44 - 130
Diethyl phthalate	100	87.8		ug/L		88	53 - 130
2,4-Dimethylphenol	100	64.5		ug/L		65	37 - 130
Dimethyl phthalate	100	81.5		ug/L		82	53 - 130
Di-n-butyl phthalate	100	85.8		ug/L		86	51 - 130
4,6-Dinitro-2-methylphenol	200	202		ug/L		101	42 - 130
2,4-Dinitrophenol	200	176		ug/L		88	31 - 130
2,4-Dinitrotoluene	100	84.9		ug/L		85	52 - 130
2,6-Dinitrotoluene	100	80.8		ug/L		81	52 - 130
Di-n-octyl phthalate	100	80.9		ug/L		81	42 - 130
Fluoranthene	100	84.9		ug/L		85	47 - 130
Fluorene	100	75.2		ug/L		75	50 - 130
Hexachlorobenzene	100	76.7		ug/L		77	43 - 130
Hexachlorobutadiene	100	59.6		ug/L		60	27 - 130
Hexachlorocyclopentadiene	100	43.5		ug/L		43	11 - 130
Hexachloroethane	100	58.0		ug/L		58	29 - 130
Indeno[1,2,3-cd]pyrene	100	85.8		ug/L		86	31 - 130
Isophorone	100	67.1		ug/L		67	47 - 130
2-Methylnaphthalene	100	63.9		ug/L		64	40 - 130
2-Methylphenol	100	69.0		ug/L		69	40 - 130
3 & 4 Methylphenol	100	69.3		ug/L		69	42 - 130
2-Nitroaniline	100	83.8		ug/L		84	51 - 130
3-Nitroaniline	100	72.8		ug/L		73	53 - 130
4-Nitroaniline	100	66.7		ug/L		67	49 - 130
Nitrobenzene	100	64.8		ug/L		65	43 - 130
2-Nitrophenol	100	65.7		ug/L		66	43 - 130
4-Nitrophenol	200	184		ug/L		92	44 - 130
N-Nitrosodi-n-propylamine	100	67.4		ug/L		67	42 - 130
N-Nitrosodiphenylamine	100	80.1		ug/L		80	50 - 130
Pentachlorophenol	200	192		ug/L		96	33 - 130
Phenanthrene	100	78.1		ug/L		78	51 - 130
Phenol	100	59.2		ug/L		59	35 - 130
Pyrene	100	77.7		ug/L		78	52 - 130
1,2,4-Trichlorobenzene	100	59.6		ug/L		60	33 - 130
2,4,5-Trichlorophenol	100	80.9		ug/L		81	48 - 130
2,4,6-Trichlorophenol	100	81.7		ug/L		82	47 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*63*		*32 - 113*
2-Fluorophenol	*59*		*26 - 109*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564109/20-A
Matrix: Water
Analysis Batch: 564309

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564109

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*63*		*32 - 118*
Phenol-d5	*62*		*27 - 110*
Terphenyl-d14	*59*		*10 - 126*
2,4,6-Tribromophenol	*82*		*39 - 124*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 460-598021/1-A
Matrix: Water
Analysis Batch: 597889

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 598021

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/26/19 09:34	03/26/19 10:30	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 09:34	03/26/19 10:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*82*		*38 - 125*	*03/26/19 09:34*	*03/26/19 10:30*	*1*
Terphenyl-d14	*89*		*70 - 130*	*03/26/19 09:34*	*03/26/19 10:30*	*1*

Lab Sample ID: LCS 460-598021/2-A
Matrix: Water
Analysis Batch: 597889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 598021

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			0.800	0.392	J	ug/L		49	10 - 137		
Naphthalene			0.800	0.353		ug/L		44	24 - 124		

Lab Sample ID: LCSD 460-598021/3-A
Matrix: Water
Analysis Batch: 597889

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 598021

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			0.800	0.414		ug/L		52	10 - 137	5	30
Naphthalene			0.800	0.370		ug/L		46	24 - 124	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5			
Terphenyl-d14			

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-565267/2
Matrix: Water
Analysis Batch: 565267

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/05/19 11:00	1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 680-565267/3
Matrix: Water
Analysis Batch: 565267

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	11.0		mg/L		110	90 - 110

Lab Sample ID: LCSD 680-565267/4
Matrix: Water
Analysis Batch: 565267

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	10.9		mg/L		109	90 - 110	1	15

Lab Sample ID: 680-166366-2 MS
Matrix: Water
Analysis Batch: 565267

Client Sample ID: GM-10S (032019)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10		10.0	20.7		mg/L		105	80 - 120

Lab Sample ID: 680-166366-2 MSD
Matrix: Water
Analysis Batch: 565267

Client Sample ID: GM-10S (032019)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10		10.0	20.9		mg/L		107	80 - 120	1	15

Lab Sample ID: MB 680-565384/34
Matrix: Water
Analysis Batch: 565384

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/05/19 18:19	1

Lab Sample ID: LCS 680-565384/35
Matrix: Water
Analysis Batch: 565384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	10.6		mg/L		106	90 - 110

Lab Sample ID: LCSD 680-565384/36
Matrix: Water
Analysis Batch: 565384

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	10.5		mg/L		105	90 - 110	1	15

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 550-173862/4
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/01/19 19:28	1

Lab Sample ID: LCS 550-173862/6
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	22.2		ug/L		89	85 - 115

Lab Sample ID: LCSD 550-173862/10
Matrix: Water
Analysis Batch: 173862

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	25.0	22.8		ug/L		91	85 - 115	2	15

Lab Sample ID: MB 550-173992/4
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/03/19 20:47	1

Lab Sample ID: LCS 550-173992/6
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	22.8		ug/L		91	85 - 115

Lab Sample ID: LCSD 550-173992/10
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	25.0	24.6		ug/L		98	85 - 115	7	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-564493/1-A
Matrix: Water
Analysis Batch: 564612

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564493

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/31/19 13:11	04/01/19 12:33	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-564493/2-A
Matrix: Water
Analysis Batch: 564612

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564493

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron	5000	5090		ug/L		102	80 - 120

Lab Sample ID: MB 680-564584/1-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564584

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<200		200	24	ug/L		04/01/19 11:47	04/04/19 18:05	1
Antimony	<20		20	5.3	ug/L		04/01/19 11:47	04/04/19 18:05	1
Arsenic	<20		20	6.2	ug/L		04/01/19 11:47	04/04/19 18:05	1
Barium	<10		10	1.7	ug/L		04/01/19 11:47	04/04/19 18:05	1
Beryllium	<4.0		4.0	0.10	ug/L		04/01/19 11:47	04/04/19 18:05	1
Cadmium	<5.0		5.0	1.0	ug/L		04/01/19 11:47	04/04/19 18:05	1
Calcium	<500		500	25	ug/L		04/01/19 11:47	04/04/19 18:05	1
Chromium	<10		10	1.6	ug/L		04/01/19 11:47	04/04/19 18:05	1
Cobalt	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:05	1
Copper	2.62	J	20	1.8	ug/L		04/01/19 11:47	04/04/19 18:05	1
Dissolved Iron	<50		50	17	ug/L		04/01/19 11:47	04/04/19 18:05	1
Iron	<50		50	17	ug/L		04/01/19 11:47	04/04/19 18:05	1
Lead	<10		10	3.9	ug/L		04/01/19 11:47	04/04/19 18:05	1
Magnesium	<500		500	33	ug/L		04/01/19 11:47	04/04/19 18:05	1
Manganese	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:05	1
Nickel	<40		40	2.1	ug/L		04/01/19 11:47	04/04/19 18:05	1
Potassium	<1000		1000	17	ug/L		04/01/19 11:47	04/04/19 18:05	1
Selenium	<20		20	9.9	ug/L		04/01/19 11:47	04/04/19 18:05	1
Silver	<10		10	0.60	ug/L		04/01/19 11:47	04/04/19 18:05	1
Sodium	<1000		1000	480	ug/L		04/01/19 11:47	04/04/19 18:05	1
Thallium	<25		25	6.0	ug/L		04/01/19 11:47	04/04/19 18:05	1
Vanadium	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:05	1
Zinc	<20		20	7.0	ug/L		04/01/19 11:47	04/04/19 18:05	1

Lab Sample ID: LCS 680-564584/2-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564584

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5360		ug/L		107	80 - 120
Antimony	50.0	49.3		ug/L		99	80 - 120
Arsenic	100	114		ug/L		114	80 - 120
Barium	100	106		ug/L		106	80 - 120
Beryllium	50.0	56.2		ug/L		112	80 - 120
Cadmium	50.0	54.7		ug/L		109	80 - 120
Calcium	5000	5270		ug/L		105	80 - 120
Chromium	100	109		ug/L		109	80 - 120
Cobalt	50.0	54.2		ug/L		108	80 - 120
Copper	100	113		ug/L		113	80 - 120
Dissolved Iron	5000	5360		ug/L		107	80 - 120
Iron	5000	5360		ug/L		107	80 - 120
Lead	500	535		ug/L		107	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-564584/2-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564584

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Magnesium	5000	5390		ug/L		108	80 - 120
Manganese	500	534		ug/L		107	80 - 120
Nickel	100	108		ug/L		108	80 - 120
Potassium	8000	8940		ug/L		112	80 - 120
Selenium	100	120		ug/L		120	80 - 120
Silver	50.0	53.4		ug/L		107	80 - 120
Sodium	5000	5540		ug/L		111	80 - 120
Thallium	40.0	41.3		ug/L		103	80 - 120
Vanadium	100	107		ug/L		107	80 - 120
Zinc	100	113		ug/L		113	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-564945/13-A
Matrix: Water
Analysis Batch: 565503

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564945

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/03/19 13:10	04/08/19 15:54	1

Lab Sample ID: LCS 680-564945/14-A
Matrix: Water
Analysis Batch: 565503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564945

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.76		ug/L		110	80 - 120

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 680-564726/10-A
Matrix: Water
Analysis Batch: 564941

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564726

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	<0.20		0.20	0.10	mg/L		04/02/19 11:33	04/03/19 10:38	1

Lab Sample ID: LCS 680-564726/11-A
Matrix: Water
Analysis Batch: 564941

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564726

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrogen, Kjeldahl	2.00	2.16		mg/L		108	75 - 125

Lab Sample ID: MB 680-564729/1-A
Matrix: Water
Analysis Batch: 564941

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564729

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	<0.20		0.20	0.10	mg/L		04/02/19 11:37	04/03/19 11:11	1

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: LCS 680-564729/2-A
Matrix: Water
Analysis Batch: 564941

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564729

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrogen, Kjeldahl	2.00	1.97		mg/L		99	75 - 125

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-563897/13
Matrix: Water
Analysis Batch: 563897

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.050		0.050	0.010	mg/L			03/27/19 09:07	1

Lab Sample ID: LCS 680-563897/16
Matrix: Water
Analysis Batch: 563897

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	1.04		mg/L		104	90 - 110

Lab Sample ID: MB 680-565333/13
Matrix: Water
Analysis Batch: 565333

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	<0.050		0.050	0.010	mg/L			04/06/19 12:09	1

Lab Sample ID: LCS 680-565333/16
Matrix: Water
Analysis Batch: 565333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.00	1.00		mg/L		100	90 - 110

Method: 5310 B-2011 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-565233/4
Matrix: Water
Analysis Batch: 565233

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/04/19 19:50	1

Lab Sample ID: LCS 680-565233/5
Matrix: Water
Analysis Batch: 565233

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.3		mg/L		97	80 - 120

Method: 5310 B-2011 - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCSD 680-565233/6
Matrix: Water
Analysis Batch: 565233

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon			20.0	19.6		mg/L		98	80 - 120	1	25

Lab Sample ID: MB 680-565396/2
Matrix: Water
Analysis Batch: 565396

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/06/19 18:49	1

Lab Sample ID: LCS 680-565396/3
Matrix: Water
Analysis Batch: 565396

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			20.0	19.7		mg/L		98	80 - 120		

Lab Sample ID: LCSD 680-565396/4
Matrix: Water
Analysis Batch: 565396

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon			20.0	19.7		mg/L		99	80 - 120	0	25

Lab Sample ID: 680-166366-6 MS
Matrix: Water
Analysis Batch: 565396

Client Sample ID: MW-12 (032019)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon	1.5		20.0	21.2		mg/L		98	80 - 120		

Lab Sample ID: 680-166366-6 MSD
Matrix: Water
Analysis Batch: 565396

Client Sample ID: MW-12 (032019)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	1.5		20.0	21.2		mg/L		98	80 - 120	0	25

GC/MS VOA

Analysis Batch: 564388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-4	MW-2 (032019)	Total/NA	Water	8260B	
MB 680-564388/9	Method Blank	Total/NA	Water	8260B	
LCS 680-564388/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564388/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-1	GM-9M (032019)	Total/NA	Water	8260B	
680-166366-2	GM-10S (032019)	Total/NA	Water	8260B	
680-166366-3	MW-1 (032019)	Total/NA	Water	8260B	
680-166366-5	MW-10 (032019)	Total/NA	Water	8260B	
680-166366-6	MW-12 (032019)	Total/NA	Water	8260B	
680-166366-8	MW-20 (032019)	Total/NA	Water	8260B	
680-166366-9	MW-22 (032019)	Total/NA	Water	8260B	
680-166366-10	DUP-02 (032019)	Total/NA	Water	8260B	
680-166366-11	GM-27 (032119)	Total/NA	Water	8260B	
680-166366-12	TB-02	Total/NA	Water	8260B	
MB 680-564389/9	Method Blank	Total/NA	Water	8260B	
LCS 680-564389/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564389/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-7	MW-13 (032019)	Total/NA	Water	8260B	
MB 680-564517/8	Method Blank	Total/NA	Water	8260B	
LCS 680-564517/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564517/4	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	8260B	
MB 680-564521/8	Method Blank	Total/NA	Water	8260B	
LCS 680-564521/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564521/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 564619

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-11	GM-27 (032119)	Total/NA	Water	8260B	
MB 680-564619/10	Method Blank	Total/NA	Water	8260B	
LCS 680-564619/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-564619/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-4	MW-2 (032019)	Total/NA	Water	8260B	
MB 680-565029/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565029/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565029/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 564109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	3520C	
MB 680-564109/19-A	Method Blank	Total/NA	Water	3520C	
LCS 680-564109/20-A	Lab Control Sample	Total/NA	Water	3520C	

Analysis Batch: 564309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	8270D	564109
MB 680-564109/19-A	Method Blank	Total/NA	Water	8270D	564109
LCS 680-564109/20-A	Lab Control Sample	Total/NA	Water	8270D	564109

Analysis Batch: 597889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 460-598021/1-A	Method Blank	Total/NA	Water	8270D SIM	598021
LCS 460-598021/2-A	Lab Control Sample	Total/NA	Water	8270D SIM	598021
LCSD 460-598021/3-A	Lab Control Sample Dup	Total/NA	Water	8270D SIM	598021

Prep Batch: 598021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-1	GM-9M (032019)	Total/NA	Water	3510C	
680-166366-2	GM-10S (032019)	Total/NA	Water	3510C	
680-166366-11	GM-27 (032119)	Total/NA	Water	3510C	
680-166366-13	EB-01 (032119)	Total/NA	Water	3510C	
MB 460-598021/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-598021/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-598021/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 598294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-1	GM-9M (032019)	Total/NA	Water	8270D SIM	598021
680-166366-2	GM-10S (032019)	Total/NA	Water	8270D SIM	598021
680-166366-11	GM-27 (032119)	Total/NA	Water	8270D SIM	598021
680-166366-13	EB-01 (032119)	Total/NA	Water	8270D SIM	598021

HPLC/IC

Analysis Batch: 173862

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-1	GM-9M (032019)	Total/NA	Water	314.0	
680-166366-2	GM-10S (032019)	Total/NA	Water	314.0	
680-166366-3	MW-1 (032019)	Total/NA	Water	314.0	
680-166366-4	MW-2 (032019)	Total/NA	Water	314.0	
680-166366-5	MW-10 (032019)	Total/NA	Water	314.0	
680-166366-6	MW-12 (032019)	Total/NA	Water	314.0	
680-166366-7	MW-13 (032019)	Total/NA	Water	314.0	
680-166366-8	MW-20 (032019)	Total/NA	Water	314.0	
680-166366-9	MW-22 (032019)	Total/NA	Water	314.0	
680-166366-10	DUP-02 (032019)	Total/NA	Water	314.0	
680-166366-11	GM-27 (032119)	Total/NA	Water	314.0	
MB 550-173862/4	Method Blank	Total/NA	Water	314.0	
LCS 550-173862/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-173862/10	Lab Control Sample Dup	Total/NA	Water	314.0	

HPLC/IC

Analysis Batch: 173992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	314.0	
MB 550-173992/4	Method Blank	Total/NA	Water	314.0	
LCS 550-173992/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-173992/10	Lab Control Sample Dup	Total/NA	Water	314.0	

Analysis Batch: 565267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-2	GM-10S (032019)	Total/NA	Water	300.0-1993 R2.1	
680-166366-4	MW-2 (032019)	Total/NA	Water	300.0-1993 R2.1	
680-166366-6	MW-12 (032019)	Total/NA	Water	300.0-1993 R2.1	
680-166366-9	MW-22 (032019)	Total/NA	Water	300.0-1993 R2.1	
680-166366-10	DUP-02 (032019)	Total/NA	Water	300.0-1993 R2.1	
MB 680-565267/2	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-565267/3	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-565267/4	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	
680-166366-2 MS	GM-10S (032019)	Total/NA	Water	300.0-1993 R2.1	
680-166366-2 MSD	GM-10S (032019)	Total/NA	Water	300.0-1993 R2.1	

Analysis Batch: 565384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	300.0-1993 R2.1	
MB 680-565384/34	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-565384/35	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-565384/36	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Prep Batch: 564493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-4	MW-2 (032019)	Dissolved	Water	3005A	
680-166366-6	MW-12 (032019)	Dissolved	Water	3005A	
680-166366-9	MW-22 (032019)	Dissolved	Water	3005A	
680-166366-10	DUP-02 (032019)	Dissolved	Water	3005A	
680-166366-13	EB-01 (032119)	Dissolved	Water	3005A	
MB 680-564493/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564493/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 564584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-2	GM-10S (032019)	Dissolved	Water	3005A	
680-166366-13	EB-01 (032119)	Total Recoverable	Water	3005A	
MB 680-564584/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564584/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 564612

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-4	MW-2 (032019)	Dissolved	Water	6010C	564493
680-166366-6	MW-12 (032019)	Dissolved	Water	6010C	564493
680-166366-9	MW-22 (032019)	Dissolved	Water	6010C	564493
680-166366-10	DUP-02 (032019)	Dissolved	Water	6010C	564493
680-166366-13	EB-01 (032119)	Dissolved	Water	6010C	564493

Metals (Continued)

Analysis Batch: 564612 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-564493/1-A	Method Blank	Total Recoverable	Water	6010C	564493
LCS 680-564493/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564493

Prep Batch: 564945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	7470A	
MB 680-564945/13-A	Method Blank	Total/NA	Water	7470A	
LCS 680-564945/14-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 565240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-2	GM-10S (032019)	Dissolved	Water	6010C	564584
680-166366-13	EB-01 (032119)	Total Recoverable	Water	6010C	564584
MB 680-564584/1-A	Method Blank	Total Recoverable	Water	6010C	564584
LCS 680-564584/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564584

Analysis Batch: 565503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-13	EB-01 (032119)	Total/NA	Water	7470A	564945
MB 680-564945/13-A	Method Blank	Total/NA	Water	7470A	564945
LCS 680-564945/14-A	Lab Control Sample	Total/NA	Water	7470A	564945

General Chemistry

Analysis Batch: 563897

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-8	MW-20 (032019)	Total/NA	Water	353.2	
MB 680-563897/13	Method Blank	Total/NA	Water	353.2	
LCS 680-563897/16	Lab Control Sample	Total/NA	Water	353.2	

Prep Batch: 564726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-9	MW-22 (032019)	Total/NA	Water	Digestion	
680-166366-13	EB-01 (032119)	Total/NA	Water	Digestion	
MB 680-564726/10-A	Method Blank	Total/NA	Water	Digestion	
LCS 680-564726/11-A	Lab Control Sample	Total/NA	Water	Digestion	

Prep Batch: 564729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-8	MW-20 (032019)	Total/NA	Water	Digestion	
MB 680-564729/1-A	Method Blank	Total/NA	Water	Digestion	
LCS 680-564729/2-A	Lab Control Sample	Total/NA	Water	Digestion	

Analysis Batch: 564941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-8	MW-20 (032019)	Total/NA	Water	351.2	564729
680-166366-9	MW-22 (032019)	Total/NA	Water	351.2	564726
680-166366-13	EB-01 (032119)	Total/NA	Water	351.2	564726
MB 680-564726/10-A	Method Blank	Total/NA	Water	351.2	564726
MB 680-564729/1-A	Method Blank	Total/NA	Water	351.2	564729
LCS 680-564726/11-A	Lab Control Sample	Total/NA	Water	351.2	564726

General Chemistry (Continued)

Analysis Batch: 564941 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-564729/2-A	Lab Control Sample	Total/NA	Water	351.2	564729

Analysis Batch: 565233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-2	GM-10S (032019)	Total/NA	Water	5310 B-2011	
680-166366-4	MW-2 (032019)	Total/NA	Water	5310 B-2011	
MB 680-565233/4	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-565233/5	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-565233/6	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Analysis Batch: 565333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-9	MW-22 (032019)	Total/NA	Water	353.2	
680-166366-13	EB-01 (032119)	Total/NA	Water	353.2	
MB 680-565333/13	Method Blank	Total/NA	Water	353.2	
LCS 680-565333/16	Lab Control Sample	Total/NA	Water	353.2	

Analysis Batch: 565396

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166366-6	MW-12 (032019)	Total/NA	Water	5310 B-2011	
680-166366-9	MW-22 (032019)	Total/NA	Water	5310 B-2011	
680-166366-10	DUP-02 (032019)	Total/NA	Water	5310 B-2011	
680-166366-13	EB-01 (032119)	Total/NA	Water	5310 B-2011	
MB 680-565396/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-565396/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-565396/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	
680-166366-6 MS	MW-12 (032019)	Total/NA	Water	5310 B-2011	
680-166366-6 MSD	MW-12 (032019)	Total/NA	Water	5310 B-2011	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-9M (032019)

Lab Sample ID: 680-166366-1

Date Collected: 03/20/19 09:40
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 16:15	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	598021	03/26/19 11:53	JMS	TAL EDI
Total/NA	Analysis	8270D SIM		1			598294	03/27/19 16:37	P1M	TAL EDI
	Instrument ID: CBNAMS4									
Total/NA	Analysis	314.0		100			173862	04/02/19 18:53	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-10S (032019)

Lab Sample ID: 680-166366-2

Date Collected: 03/20/19 09:45
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 16:41	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	598021	03/26/19 11:53	JMS	TAL EDI
Total/NA	Analysis	8270D SIM		1			598294	03/27/19 16:58	P1M	TAL EDI
	Instrument ID: CBNAMS4									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565267	04/05/19 16:38	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			173862	04/02/19 01:57	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564584	04/01/19 11:47	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 18:42	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565233	04/05/19 01:58	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: MW-1 (032019)

Lab Sample ID: 680-166366-3

Date Collected: 03/20/19 12:00
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 17:07	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		100			173862	04/02/19 19:16	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: MW-2 (032019)

Lab Sample ID: 680-166366-4

Date Collected: 03/20/19 13:20
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		20	5 mL	5 mL	564388	03/30/19 17:45	UI	TAL SAV
	Instrument ID: CMSB									

Client Sample ID: MW-2 (032019)

Lab Sample ID: 680-166366-4

Date Collected: 03/20/19 13:20

Matrix: Water

Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565267	04/05/19 17:16	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		200			173862	04/02/19 19:39	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564493	03/31/19 13:11	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564612	04/01/19 13:04	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565233	04/05/19 02:18	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: MW-10 (032019)

Lab Sample ID: 680-166366-5

Date Collected: 03/20/19 15:45

Matrix: Water

Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 17:33	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		1			173862	04/02/19 03:06	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: MW-12 (032019)

Lab Sample ID: 680-166366-6

Date Collected: 03/20/19 15:05

Matrix: Water

Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 17:58	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565267	04/05/19 17:29	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		100			173862	04/02/19 20:02	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564493	03/31/19 13:11	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564612	04/01/19 13:13	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565396	04/06/19 21:17	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: MW-13 (032019)

Lab Sample ID: 680-166366-7

Date Collected: 03/20/19 14:40

Matrix: Water

Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	5 mL	5 mL	564517	04/01/19 13:37	UI	TAL SAV
	Instrument ID: CMSA2									
Total/NA	Analysis	314.0		100			173862	04/02/19 20:25	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-20 (032019)

Lab Sample ID: 680-166366-8

Date Collected: 03/20/19 13:30
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 18:24	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		100			173862	04/02/19 20:48	NEL	TAL PHX
	Instrument ID: IC4									
Total/NA	Prep	Digestion			20 mL	20 mL	564729	04/02/19 11:37	NVF	TAL SAV
Total/NA	Analysis	351.2		1			564941	04/03/19 11:47	JER	TAL SAV
	Instrument ID: LACHAT3									
Total/NA	Analysis	353.2		10	2 mL	2 mL	563897	03/27/19 09:32	AMH	TAL SAV
	Instrument ID: LACHAT2									

Client Sample ID: MW-22 (032019)

Lab Sample ID: 680-166366-9

Date Collected: 03/20/19 12:15
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 18:50	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565267	04/05/19 17:41	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			173862	04/02/19 05:24	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564493	03/31/19 13:11	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564612	04/01/19 13:09	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	Digestion			20 mL	20 mL	564726	04/02/19 11:33	NVF	TAL SAV
Total/NA	Analysis	351.2		1			564941	04/03/19 11:06	JER	TAL SAV
	Instrument ID: LACHAT3									
Total/NA	Analysis	353.2		1	2 mL	2 mL	565333	04/06/19 12:29	EJP	TAL SAV
	Instrument ID: LACHAT2									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565396	04/06/19 22:24	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: DUP-02 (032019)

Lab Sample ID: 680-166366-10

Date Collected: 03/20/19 12:00
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 19:15	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565267	04/05/19 17:54	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		200			173862	04/02/19 21:11	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: DUP-02 (032019)

Lab Sample ID: 680-166366-10

Date Collected: 03/20/19 12:00
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1			564612	04/01/19 13:17	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565396	04/06/19 22:50	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-27 (032119)

Lab Sample ID: 680-166366-11

Date Collected: 03/21/19 11:15
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564619	04/02/19 02:13	UI	TAL SAV
	Instrument ID: CMSA2									
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 15:50	UI	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	598021	03/26/19 11:53	JMS	TAL EDI
Total/NA	Analysis	8270D SIM		1			598294	03/27/19 17:19	P1M	TAL EDI
	Instrument ID: CBNAMS4									
Total/NA	Analysis	314.0		1			173862	04/02/19 06:09	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: TB-02

Lab Sample ID: 680-166366-12

Date Collected: 03/20/19 00:00
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564389	03/30/19 11:58	UI	TAL SAV
	Instrument ID: CMSP2									

Client Sample ID: EB-01 (032119)

Lab Sample ID: 680-166366-13

Date Collected: 03/21/19 12:00
Matrix: Water
Date Received: 03/23/19 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	564521	04/01/19 17:21	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3520C			565.5 mL	1 mL	564109	03/28/19 16:10	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564309	03/29/19 18:59	DBM	TAL SAV
	Instrument ID: CMST									
Total/NA	Prep	3510C			250 mL	2 mL	598021	03/26/19 11:53	JMS	TAL EDI
Total/NA	Analysis	8270D SIM		1			598294	03/27/19 17:41	P1M	TAL EDI
	Instrument ID: CBNAMS4									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565384	04/05/19 22:45	SMP	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			173992	04/03/19 21:10	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)

Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13

Matrix: Water

Dissolved	Analysis	6010C	1			564612	04/01/19 13:22	BCB	TAL SAV
	Instrument ID: ICPE								
Total Recoverable	Prep	3005A		50 mL	50 mL	564584	04/01/19 11:47	AJR	TAL SAV
Total Recoverable	Analysis	6010C	1			565240	04/04/19 18:47	BCB	TAL SAV
	Instrument ID: ICPE								
Total/NA	Prep	7470A		50 mL	50 mL	564945	04/03/19 13:10	PEP	TAL SAV
Total/NA	Analysis	7470A	1			565503	04/08/19 11:48	PEP	TAL SAV
	Instrument ID: LEEMAN2								
Total/NA	Prep	Digestion		20 mL	20 mL	564726	04/02/19 11:33	NVF	TAL SAV
Total/NA	Analysis	351.2	1			564941	04/03/19 11:05	JER	TAL SAV
	Instrument ID: LACHAT3								
Total/NA	Analysis	353.2	1	2 mL	2 mL	565333	04/06/19 12:30	EJP	TAL SAV
	Instrument ID: LACHAT2								
Total/NA	Analysis	5310 B-2011	1	40 mL	40 mL	565396	04/06/19 23:09	KDM	TAL SAV
	Instrument ID: TOC7								

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Baltimore #201

Chain of Custody Record 309992

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact:	Date:	COC No:
Company Name: Arcadis	Tel/Fax: 1410 279 8637	Lab Contact:	Carrier:	1 of 2 COCs
Address: 7550 Teague Rd ste. 210	Analysis Turnaround Time			Sampler: AF / KM / MK
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day			Lab Sampling:
Project Name: ATK Orbital Elkton				Job / SDG No.:
Site: Elkton				
PO# MD001006.0006				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOC	8270D - SVOC	6010C - Total Metals	6010C - Dissolved Iron	SM5310 - TOC	300 ORGFM - Sulfate	Nitrite, Nitrate, TCN	1,4-Dioxane	314.0 Perchlorate	Sample Specific Notes:
GM-9M (032019)	3/20	0940	G	GW	6	N	N	3							2	1	
GM-10S (032019		0945			11	Y		3			1	3	1		2	1	
MW-1 (032019)		1200			4	N		3								1	
MW-2 (032019		1320			9	Y		3			1	3	1			1	
MW-10 (032019)		1545			4	N		3								1	
MW-12 (032019		1505			9	Y		3			1	3	1			1	
MW-13 (032019		1440			4	N		3								1	
MW-20 (032019		1330			5	N		3						1		1	
MW-22 (032019		1215			10	Y		3			1	3	1	1		1	
DUP-02 (032019	3/20	1200			9	Y		3			1	3	1			1	
GM-27 (03219	3/21	1115	G	GW	6	N		3							2	1	
TB-02					3	N	N	3									

680-166366 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: 2 coolers 1.3/1.5 1.6/1.8 CUICES

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: ____ Corr'd: ____	Therm ID No.: ____

Relinquished by:	Company: Arcadis	Date/Time: 3/22	Received by:	Company: TA	Date/Time: 3/22/19 1600
Relinquished by:	Company: TA	Date/Time: 3/22/19 1700	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA SDV	Date/Time: 3/23/19 1040

4/8/2019

Baltimore #201

Chain of Custody Record

309993

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

4/8/2019

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact:	Date:	COC No:
Company Name: Arcadis	Tel/Fax: 1410 279 8637	Lab Contact:	Carrier:	2 of 2 COCs
Address: 7550 Teague Rd ste. 210	Analysis Turnaround Time			Sampler: AF/EM/MK
City/State/Zip: Hanover, Md 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital/Elkton	☐ 1 week			
Site: Elkton	☐ 2 days			Job / SDG No.:
PO# MD001006.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	8260B - VOC	8270D - SVOC	6010C - Total/Metals	6010C - dissolved Metals	SM 5310 - TOC	300.0 R6FM - Sulfate	Nitrate, Nitrate, TKN	1,4-Dioxane	314.0 Perchlorate	Sample Specific Notes:
EB-01 (032119)	3/21	1200			24	Y	N	9	1	1	1	3	1	1	4	3	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 2coolers 1.3/1.5 1.6/1.8 CUI#25

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	3/22		TA	3/22/19 1600
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	TA 3/22/19	1700			
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				TA STL	3/23/19 1041

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559011.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166366-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/4/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
		Preservation Codes:						
GM-9M (032019) (680-166366-1)	3/20/19	09:40 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-10S (032019) (680-166366-2)	3/20/19	09:45 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-27 (032119) (680-166366-11)	3/21/19	11:15 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
EB-01 (032119) (680-166366-13)	3/21/19	12:00 Eastern		Water		X	4	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 3-25-19 1323	Company	Received by: Angela Pinta via FEDEX	Date/Time: 03/26/19 09:10	Company TA Edison		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 700292		Cooler Temperature(s) °C and Other Remarks: 1.2°C IR#9				

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166366-1

Login Number: 166366

List Source: Eurofins TestAmerica, Savannah

List Number: 1

Creator: Weston, Pamela

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166366-1

Login Number: 166366
List Number: 2
Creator: Meyers, Gary

List Source: Eurofins TestAmerica, Edison
List Creation: 03/26/19 11:28 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166366-1

Login Number: 166366
List Number: 3
Creator: Armbruster, Chris

List Source: Eurofins TestAmerica, Edison
List Creation: 03/26/19 11:30 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	700292
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2°C IR9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166366-1

Login Number: 166366
List Number: 4
Creator: Gravlin, Andrea

List Source: Eurofins TestAmerica, Phoenix
List Creation: 03/26/19 10:53 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	250	12-31-19

Laboratory: Eurofins TestAmerica, Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-19
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

Laboratory: Eurofins TestAmerica, Phoenix

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP		154268	07-01-19
AIHA-LAP, LLC	IHLAP		154268	07-01-19
Arizona	State Program	9	AZ0728	06-09-19
California	LA Cty Sanitation Districts	9	9254471	04-10-19 *
California	State Program	9	2941	03-09-19 *
Nevada	State Program	9	AZ01030	07-31-19
Oregon	NELAP	10	AZ100001	03-09-20
USDA	Federal		P330-16-00302	08-27-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

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ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-166434-1
Client Project/Site: ATK Orbital Elkton

For:
ARCADIS U.S., Inc.
7550 Teague Road
Suite 210
Hanover, Maryland 21076

Attn: Ms. Tina Armstrong

Authorized for release by:
4/9/2019 6:46:47 PM

Jerry Lanier, Project Manager I
(912)250-0281
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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 680-166434-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: ATK Orbital Elkton

Report Number: 680-166434-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 03/26/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.6 C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples BS-1 (032219) (680-166434-1), MW-5 (032219) (680-166434-2), MW-19 (032219) (680-166434-4), MW-23 (032219) (680-166434-5), DUP03 (032219) (680-166434-6), MW-25 (032219) (680-166434-7), MW-28 (032219) (680-166434-8), MW-29 (032219) (680-166434-9) and TB-03 (032519) (680-166434-10) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 04/04/2019 and 04/05/2019.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-565029 recovered outside control limits for the following analytes: Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

The laboratory control sample duplicate (LCSD) for analytical batch 680-565158 recovered outside control limits for the following analyte: Chloromethane. This analyte was biased high in the LCSD but was not detected in the associated samples; therefore, the data have been reported.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-565029, and 680-565158.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (AQUEOUS)

Sample BS-1 (032219) (680-166434-1) was analyzed for Semivolatile Organic Compounds (Aqueous) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 03/28/2019 and analyzed on 03/29/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCHLORATE (IC)

Samples BS-1 (032219) (680-166434-1), MW-5 (032219) (680-166434-2), MW-19 (032219) (680-166434-4), MW-23 (032219) (680-166434-5), DUP03 (032219) (680-166434-6), MW-25 (032219) (680-166434-7), MW-28 (032219) (680-166434-8) and MW-29 (032219) (680-166434-9) were analyzed for perchlorate (IC) in accordance with EPA Method 314.0. The samples were analyzed on 04/03/2019 and 04/04/2019.

Samples MW-19 (032219) (680-166434-4)[100X], MW-25 (032219) (680-166434-7)[10X], MW-28 (032219) (680-166434-8)[10X] and

Job ID: 680-166434-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

MW-29 (032219) (680-166434-9)[200X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP) - DISSOLVED

Samples BS-1 (032219) (680-166434-1), MW-25 (032219) (680-166434-7) and MW-28 (032219) (680-166434-8) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/02/2019 and analyzed on 04/03/2019.

Dissolved Iron failed the recovery criteria low for the MS/MSD of sample MW-28 (032219) (680-166434-8) in batch 680-564904.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)

Sample BS-1 (032219) (680-166434-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/02/2019 and analyzed on 04/04/2019.

Copper and Selenium were detected in method blank MB 680-564743/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Sample BS-1 (032219) (680-166434-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 04/03/2019 and analyzed on 04/05/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples BS-1 (032219) (680-166434-1), MW-25 (032219) (680-166434-7) and MW-28 (032219) (680-166434-8) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 04/08/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL NITROGEN BY CALCULATION

Sample MW-11 (032219) (680-166434-3) was analyzed for total nitrogen by calculation in accordance with a calculated method. The samples were analyzed on 03/26/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples BS-1 (032219) (680-166434-1), MW-25 (032219) (680-166434-7) and MW-28 (032219) (680-166434-8) were analyzed for total organic carbon in accordance with SM 5310B. The samples were analyzed on 04/07/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-166434-1	BS-1 (032219)	Water	03/22/19 12:30	03/26/19 08:58
680-166434-2	MW-5 (032219)	Water	03/22/19 14:00	03/26/19 08:58
680-166434-3	MW-11 (032219)	Water	03/22/19 13:00	03/26/19 08:58
680-166434-4	MW-19 (032219)	Water	03/22/19 14:45	03/26/19 08:58
680-166434-5	MW-23 (032219)	Water	03/22/19 10:30	03/26/19 08:58
680-166434-6	DUP03 (032219)	Water	03/22/19 12:00	03/26/19 08:58
680-166434-7	MW-25 (032219)	Water	03/22/19 15:40	03/26/19 08:58
680-166434-8	MW-28 (032219)	Water	03/22/19 10:25	03/26/19 08:58
680-166434-9	MW-29 (032219)	Water	03/22/19 11:40	03/26/19 08:58
680-166434-10	TB-03 (032519)	Water	03/22/19 00:00	03/26/19 08:58

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SAV
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
314.0	Perchlorate (IC)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
5310 B-2011	Organic Carbon, Total (TOC)	SM	TAL SAV
Total Nitrogen	Nitrogen, Total	EPA	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219) — Lab Sample ID: 680-166434-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Caprolactam	87		9.6	0.76	ug/L	1		8270D	Total/NA
Sulfate	1.2		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Aluminum	320		200	24	ug/L	1		6010C	Total Recoverable
Barium	21		10	1.7	ug/L	1		6010C	Total Recoverable
Calcium	35000		500	25	ug/L	1		6010C	Total Recoverable
Chromium	3.0	J	10	1.6	ug/L	1		6010C	Total Recoverable
Cobalt	2.7	J	10	1.0	ug/L	1		6010C	Total Recoverable
Copper	6.5	J B	20	1.8	ug/L	1		6010C	Total Recoverable
Iron	1800		50	17	ug/L	1		6010C	Total Recoverable
Magnesium	10000		500	33	ug/L	1		6010C	Total Recoverable
Manganese	230		10	1.0	ug/L	1		6010C	Total Recoverable
Nickel	5.5	J	40	2.1	ug/L	1		6010C	Total Recoverable
Potassium	1100		1000	17	ug/L	1		6010C	Total Recoverable
Sodium	24000		1000	480	ug/L	1		6010C	Total Recoverable
Vanadium	2.4	J	10	1.0	ug/L	1		6010C	Total Recoverable
Zinc	7.3	J	20	7.0	ug/L	1		6010C	Total Recoverable
Dissolved Iron	200		50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	4.0		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-5 (032219) — Lab Sample ID: 680-166434-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.7		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	0.62	J	1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	0.60	J	1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	2.7		2.0	0.37	ug/L	1		8260B	Total/NA
Tetrachloroethene	29		1.0	0.74	ug/L	1		8260B	Total/NA
Trichloroethene	14		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	15		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: MW-11 (032219) — Lab Sample ID: 680-166434-3

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrogen, Total	1.6		0.25	0.25	mg/L	1		Total Nitrogen	Total/NA

Client Sample ID: MW-19 (032219) — Lab Sample ID: 680-166434-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	1.5		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	10		1.0	0.36	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	2.8		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	1.7		1.0	0.48	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-19 (032219) (Continued) — Lab Sample ID: 680-166434-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perchlorate	650		100	31	ug/L	100		314.0	Total/NA

Client Sample ID: MW-23 (032219) — Lab Sample ID: 680-166434-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	1.8		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	1.4		1.0	0.36	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	7.9		1.0	0.37	ug/L	1		8260B	Total/NA
Perchlorate	7.9		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: DUP03 (032219) — Lab Sample ID: 680-166434-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	1.6		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	1.3		1.0	0.36	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	7.3		1.0	0.37	ug/L	1		8260B	Total/NA
Perchlorate	7.7		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: MW-25 (032219) — Lab Sample ID: 680-166434-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	22		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	56		10	3.1	ug/L	10		314.0	Total/NA
Total Organic Carbon	3.1		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-28 (032219) — Lab Sample ID: 680-166434-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.9		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	30		1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.64	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	2.3		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	2.9		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	14		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	20		1.0	0.48	ug/L	1		8260B	Total/NA
Vinyl chloride	2.1		1.0	0.50	ug/L	1		8260B	Total/NA
Sulfate	26		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	160		10	3.1	ug/L	10		314.0	Total/NA
Dissolved Iron	14000	F1	50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	9.2		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: MW-29 (032219) — Lab Sample ID: 680-166434-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.7		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	4.6		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	7.8		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	1.7	J	2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	12		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	17		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	4100		200	63	ug/L	200		314.0	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: TB-03 (032519) **Lab Sample ID: 680-166434-10**

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 12:10	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 12:10	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 12:10	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 12:10	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 12:10	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 12:10	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 12:10	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 12:10	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 12:10	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 12:10	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 12:10	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 12:10	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 12:10	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 12:10	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 12:10	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 12:10	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 12:10	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 12:10	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 12:10	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 12:10	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 12:10	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 12:10	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 12:10	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 12:10	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 12:10	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 12:10	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 12:10	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 12:10	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 12:10	1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 12:10	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 12:10	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 12:10	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 12:10	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 12:10	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 12:10	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 12:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 12:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 12:10*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 12:10*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 12:10*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
Acenaphthylene	<9.6		9.6	0.82	ug/L		03/28/19 16:10	03/29/19 20:30	1
Acetophenone	<9.6		9.6	0.55	ug/L		03/28/19 16:10	03/29/19 20:30	1
Anthracene	<9.6		9.6	0.67	ug/L		03/28/19 16:10	03/29/19 20:30	1
Atrazine	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzaldehyde	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[a]anthracene	<9.6		9.6	0.53	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[a]pyrene	<9.6		9.6	0.68	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[b]fluoranthene	<9.6		9.6	2.5	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[g,h,i]perylene	<9.6		9.6	0.84	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[k]fluoranthene	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,1'-Biphenyl	<9.6		9.6	0.56	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-chloroethoxy)methane	<9.6		9.6	0.91	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-chloroethyl)ether	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
bis (2-chloroisopropyl) ether	<9.6		9.6	0.75	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-ethylhexyl) phthalate	<9.6		9.6	1.5	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Bromophenyl phenyl ether	<9.6		9.6	0.74	ug/L		03/28/19 16:10	03/29/19 20:30	1
Butyl benzyl phthalate	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
Caprolactam	**87**		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
Carbazole	<9.6		9.6	0.68	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chloroaniline	<19		19	2.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chloro-3-methylphenol	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.6		9.6	0.77	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Chlorophenol	<9.6		9.6	0.84	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chlorophenyl phenyl ether	<9.6		9.6	0.81	ug/L		03/28/19 16:10	03/29/19 20:30	1
Chrysene	<9.6		9.6	0.49	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dibenz(a,h)anthracene	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dibenzofuran	<9.6		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,2-Dichlorobenzene	<9.6		9.6	0.51	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,3-Dichlorobenzene	<9.6		9.6	0.57	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,4-Dichlorobenzene	<9.6		9.6	0.52	ug/L		03/28/19 16:10	03/29/19 20:30	1
3,3'-Dichlorobenzidine	<58		58	29	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dichlorophenol	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Diethyl phthalate	<9.6		9.6	0.85	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dimethylphenol	<9.6		9.6	3.9	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dimethyl phthalate	<9.6		9.6	0.95	ug/L		03/28/19 16:10	03/29/19 20:30	1
Di-n-butyl phthalate	<9.6		9.6	0.80	ug/L		03/28/19 16:10	03/29/19 20:30	1
4,6-Dinitro-2-methylphenol	<48		48	9.6	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dinitrophenol	<48		48	9.6	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dinitrotoluene	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,6-Dinitrotoluene	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Di-n-octyl phthalate	<9.6		9.6	1.4	ug/L		03/28/19 16:10	03/29/19 20:30	1
Fluoranthene	<9.6		9.6	0.71	ug/L		03/28/19 16:10	03/29/19 20:30	1
Fluorene	<9.6		9.6	0.93	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorobenzene	<9.6		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorobutadiene	<9.6		9.6	0.60	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorocyclopentadiene	<9.6		9.6	2.4	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachloroethane	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
Indeno[1,2,3-cd]pyrene	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1
Isophorone	<9.6		9.6	0.87	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Methylnaphthalene	<9.6		9.6	0.75	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Methylphenol	<9.6		9.6	0.86	ug/L		03/28/19 16:10	03/29/19 20:30	1
3 & 4 Methylphenol	<9.6		9.6	1.3	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Nitroaniline	<48		48	1.3	ug/L		03/28/19 16:10	03/29/19 20:30	1
3-Nitroaniline	<48		48	4.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Nitroaniline	<48		48	4.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
Nitrobenzene	<9.6		9.6	0.70	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Nitrophenol	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Nitrophenol	<48		48	1.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
N-Nitrosodi-n-propylamine	<9.6		9.6	0.69	ug/L		03/28/19 16:10	03/29/19 20:30	1
N-Nitrosodiphenylamine	<9.6		9.6	0.89	ug/L		03/28/19 16:10	03/29/19 20:30	1
Pentachlorophenol	<48		48	1.9	ug/L		03/28/19 16:10	03/29/19 20:30	1
Phenanthrene	<9.6		9.6	0.74	ug/L		03/28/19 16:10	03/29/19 20:30	1
Phenol	<9.6		9.6	0.80	ug/L		03/28/19 16:10	03/29/19 20:30	1
Pyrene	<9.6		9.6	0.61	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,2,4-Trichlorobenzene	<9.6		9.6	0.54	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4,5-Trichlorophenol	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4,6-Trichlorophenol	<9.6		9.6	0.82	ug/L		03/28/19 16:10	03/29/19 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*76*		*32 - 113*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
2-Fluorophenol	*57*		*26 - 109*	*03/28/19 16:10*	*03/29/19 20:30*	*1*

Client Sample ID: BS-1 (032219)

Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*32 - 118*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
Phenol-d5	*63*		*27 - 110*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
Terphenyl-d14	*37*		*10 - 126*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*03/28/19 16:10*	*03/29/19 20:30*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**1.2**		1.0	0.40	mg/L			04/08/19 23:22	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/03/19 21:56	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**320**		200	24	ug/L		04/02/19 12:50	04/04/19 19:55	1
Antimony	<20		20	5.3	ug/L		04/02/19 12:50	04/04/19 19:55	1
Arsenic	<20		20	6.2	ug/L		04/02/19 12:50	04/04/19 19:55	1
Barium	**21**		10	1.7	ug/L		04/02/19 12:50	04/04/19 19:55	1
Beryllium	<4.0		4.0	0.10	ug/L		04/02/19 12:50	04/04/19 19:55	1
Cadmium	<5.0		5.0	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Calcium	**35000**		500	25	ug/L		04/02/19 12:50	04/04/19 19:55	1
Chromium	**3.0**	**J**	10	1.6	ug/L		04/02/19 12:50	04/04/19 19:55	1
Cobalt	**2.7**	**J**	10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Copper	**6.5**	**J B**	20	1.8	ug/L		04/02/19 12:50	04/04/19 19:55	1
Iron	**1800**		50	17	ug/L		04/02/19 12:50	04/04/19 19:55	1
Lead	<10		10	3.9	ug/L		04/02/19 12:50	04/04/19 19:55	1
Magnesium	**10000**		500	33	ug/L		04/02/19 12:50	04/04/19 19:55	1
Manganese	**230**		10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Nickel	**5.5**	**J**	40	2.1	ug/L		04/02/19 12:50	04/04/19 19:55	1
Potassium	**1100**		1000	17	ug/L		04/02/19 12:50	04/04/19 19:55	1
Selenium	<20		20	9.9	ug/L		04/02/19 12:50	04/04/19 19:55	1
Silver	<10		10	0.60	ug/L		04/02/19 12:50	04/04/19 19:55	1
Sodium	**24000**		1000	480	ug/L		04/02/19 12:50	04/04/19 19:55	1
Thallium	<25		25	6.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Vanadium	**2.4**	**J**	10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Zinc	**7.3**	**J**	20	7.0	ug/L		04/02/19 12:50	04/04/19 19:55	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**200**		50	17	ug/L		04/02/19 11:24	04/03/19 01:15	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/03/19 14:17	04/05/19 22:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**4.0**		1.0	0.50	mg/L			04/07/19 07:16	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-5 (032219)
Date Collected: 03/22/19 14:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 02:17	1
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 02:17	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 02:17	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 02:17	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 02:17	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/05/19 02:17	1
Chloroform	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Chloromethane	<1.0	*	1.0	0.40	ug/L			04/05/19 02:17	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 02:17	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
cis-1,2-Dichloroethene	**2.7**		1.0	0.41	ug/L			04/05/19 02:17	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 02:17	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 02:17	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 02:17	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 02:17	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 02:17	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 02:17	1
1,1-Dichloroethane	**0.62**	**J**	1.0	0.38	ug/L			04/05/19 02:17	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
1,1-Dichloroethene	**0.60**	**J**	1.0	0.36	ug/L			04/05/19 02:17	1
1,2-Dichloroethene, Total	**2.7**		2.0	0.37	ug/L			04/05/19 02:17	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 02:17	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 02:17	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 02:17	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 02:17	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 02:17	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 02:17	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 02:17	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 02:17	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 02:17	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 02:17	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 02:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-5 (032219)
Date Collected: 03/22/19 14:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 02:17	1
Tetrachloroethene	**29**		1.0	0.74	ug/L			04/05/19 02:17	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 02:17	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Trichloroethene	**14**		1.0	0.48	ug/L			04/05/19 02:17	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 02:17	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 02:17	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 02:17	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 02:17	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 02:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/05/19 02:17*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/05/19 02:17*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/05/19 02:17*	*1*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*		*04/05/19 02:17*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**15**		1.0	0.31	ug/L			04/03/19 23:28	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-11 (032219)
Date Collected: 03/22/19 13:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-3
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Total	1.6		0.25	0.25	mg/L			03/26/19 15:01	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-19 (032219)
Date Collected: 03/22/19 14:45
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 15:36	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 15:36	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 15:36	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 15:36	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 15:36	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 15:36	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 15:36	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 15:36	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 15:36	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 15:36	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 15:36	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 15:36	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 15:36	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 15:36	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 15:36	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 15:36	1
1,1-Dichloroethane	**1.5**		1.0	0.38	ug/L			04/04/19 15:36	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
1,1-Dichloroethene	**10**		1.0	0.36	ug/L			04/04/19 15:36	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 15:36	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 15:36	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 15:36	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 15:36	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 15:36	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 15:36	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 15:36	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:36	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 15:36	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 15:36	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 15:36	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 15:36	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-19 (032219)
Date Collected: 03/22/19 14:45
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 15:36	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 15:36	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 15:36	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
1,1,1-Trichloroethane	**2.8**		1.0	0.37	ug/L			04/04/19 15:36	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Trichloroethene	**1.7**		1.0	0.48	ug/L			04/04/19 15:36	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 15:36	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:36	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 15:36	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 15:36	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 15:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 15:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 15:36*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 15:36*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/04/19 15:36*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**650**		100	31	ug/L			04/04/19 17:27	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-23 (032219)
Date Collected: 03/22/19 10:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 13:28	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 13:28	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 13:28	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 13:28	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 13:28	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 13:28	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 13:28	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 13:28	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 13:28	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 13:28	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 13:28	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 13:28	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 13:28	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 13:28	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 13:28	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 13:28	1
1,1-Dichloroethane	**1.8**		1.0	0.38	ug/L			04/04/19 13:28	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
1,1-Dichloroethene	**1.4**		1.0	0.36	ug/L			04/04/19 13:28	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 13:28	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 13:28	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 13:28	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 13:28	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 13:28	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 13:28	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 13:28	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:28	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 13:28	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 13:28	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 13:28	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-23 (032219)
Date Collected: 03/22/19 10:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 13:28	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 13:28	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
1,1,1-Trichloroethane	**7.9**		1.0	0.37	ug/L			04/04/19 13:28	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 13:28	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:28	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 13:28	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 13:28	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 13:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*04/04/19 13:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 13:28*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 13:28*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 13:28*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**7.9**		1.0	0.31	ug/L			04/04/19 00:14	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: DUP03 (032219)
Date Collected: 03/22/19 12:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 13:53	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 13:53	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 13:53	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 13:53	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 13:53	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 13:53	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 13:53	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 13:53	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 13:53	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 13:53	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 13:53	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 13:53	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 13:53	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 13:53	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 13:53	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 13:53	1
1,1-Dichloroethane	**1.6**		1.0	0.38	ug/L			04/04/19 13:53	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
1,1-Dichloroethene	**1.3**		1.0	0.36	ug/L			04/04/19 13:53	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 13:53	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 13:53	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 13:53	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 13:53	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 13:53	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 13:53	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 13:53	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:53	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 13:53	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 13:53	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 13:53	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: DUP03 (032219)
Date Collected: 03/22/19 12:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 13:53	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 13:53	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
1,1,1-Trichloroethane	**7.3**		1.0	0.37	ug/L			04/04/19 13:53	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 13:53	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:53	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 13:53	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 13:53	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 13:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 13:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 13:53*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 13:53*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 13:53*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**7.7**		1.0	0.31	ug/L			04/04/19 00:36	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-25 (032219)
Date Collected: 03/22/19 15:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 14:19	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 14:19	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 14:19	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 14:19	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 14:19	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 14:19	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 14:19	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 14:19	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 14:19	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 14:19	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 14:19	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 14:19	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 14:19	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 14:19	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 14:19	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 14:19	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 14:19	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 14:19	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 14:19	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 14:19	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 14:19	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 14:19	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 14:19	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 14:19	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 14:19	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:19	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 14:19	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 14:19	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 14:19	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-25 (032219)

Date Collected: 03/22/19 15:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-7

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 14:19	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 14:19	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 14:19	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:19	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 14:19	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 14:19	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 14:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 14:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 14:19*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 14:19*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/04/19 14:19*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**22**		1.0	0.40	mg/L			04/08/19 23:35	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**56**		10	3.1	ug/L			04/04/19 17:50	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/02/19 11:24	04/03/19 01:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**3.1**		1.0	0.50	mg/L			04/07/19 08:31	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-28 (032219)
Date Collected: 03/22/19 10:25
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 14:45	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 14:45	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 14:45	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 14:45	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 14:45	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 14:45	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 14:45	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 14:45	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 14:45	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 14:45	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 14:45	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
cis-1,2-Dichloroethene	**2.9**		1.0	0.41	ug/L			04/04/19 14:45	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 14:45	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 14:45	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 14:45	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 14:45	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 14:45	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 14:45	1
1,1-Dichloroethane	**30**		1.0	0.38	ug/L			04/04/19 14:45	1
1,2-Dichloroethane	**0.64**	**J**	1.0	0.50	ug/L			04/04/19 14:45	1
1,1-Dichloroethene	**2.3**		1.0	0.36	ug/L			04/04/19 14:45	1
1,2-Dichloroethene, Total	**2.9**		2.0	0.37	ug/L			04/04/19 14:45	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 14:45	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 14:45	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 14:45	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 14:45	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 14:45	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 14:45	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:45	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 14:45	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 14:45	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 14:45	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 14:45	1

Client Sample ID: MW-28 (032219)
Date Collected: 03/22/19 10:25
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 14:45	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 14:45	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 14:45	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
1,1,1-Trichloroethane	**14**		1.0	0.37	ug/L			04/04/19 14:45	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Trichloroethene	**20**		1.0	0.48	ug/L			04/04/19 14:45	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 14:45	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:45	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 14:45	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 14:45	1
Vinyl chloride	**2.1**		1.0	0.50	ug/L			04/04/19 14:45	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 14:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 14:45*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 14:45*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/04/19 14:45*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**26**		1.0	0.40	mg/L			04/08/19 23:47	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**160**		10	3.1	ug/L			04/04/19 18:13	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**14000**	**F1**	50	17	ug/L		04/02/19 11:24	04/03/19 00:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**9.2**		1.0	0.50	mg/L			04/07/19 08:56	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-29 (032219)
Date Collected: 03/22/19 11:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 15:10	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 15:10	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 15:10	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 15:10	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 15:10	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 15:10	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 15:10	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 15:10	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 15:10	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
cis-1,2-Dichloroethene	**1.7**		1.0	0.41	ug/L			04/04/19 15:10	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 15:10	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 15:10	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 15:10	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 15:10	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 15:10	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 15:10	1
1,1-Dichloroethane	**4.6**		1.0	0.38	ug/L			04/04/19 15:10	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
1,1-Dichloroethene	**7.8**		1.0	0.36	ug/L			04/04/19 15:10	1
1,2-Dichloroethene, Total	**1.7**	**J**	2.0	0.37	ug/L			04/04/19 15:10	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 15:10	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 15:10	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 15:10	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 15:10	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 15:10	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 15:10	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:10	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 15:10	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 15:10	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 15:10	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 15:10	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-29 (032219)
Date Collected: 03/22/19 11:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 15:10	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 15:10	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 15:10	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
1,1,1-Trichloroethane	**12**		1.0	0.37	ug/L			04/04/19 15:10	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Trichloroethene	**17**		1.0	0.48	ug/L			04/04/19 15:10	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 15:10	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:10	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 15:10	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 15:10	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 15:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 15:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 15:10*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 15:10*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 15:10*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4100**		200	63	ug/L			04/04/19 23:11	200

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: TB-03 (032519)
Date Collected: 03/22/19 00:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 11:19	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 11:19	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/04/19 11:19	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 11:19	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 11:19	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 11:19	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 11:19	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 11:19	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 11:19	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 11:19	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 11:19	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 11:19	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 11:19	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 11:19	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 11:19	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 11:19	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 11:19	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 11:19	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 11:19	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 11:19	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 11:19	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 11:19	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 11:19	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 11:19	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 11:19	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 11:19	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 11:19	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 11:19	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 11:19	1

Client Sample ID: TB-03 (032519)
Date Collected: 03/22/19 00:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 11:19	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 11:19	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 11:19	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 11:19	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 11:19	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 11:19	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 11:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*80 - 120*		*04/04/19 11:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 11:19*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 11:19*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/04/19 11:19*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-166434-1	BS-1 (032219)	103	86	93	98
680-166434-2	MW-5 (032219)	96	93	101	86
680-166434-4	MW-19 (032219)	104	86	94	99
680-166434-5	MW-23 (032219)	102	86	93	98
680-166434-6	DUP03 (032219)	104	85	94	98
680-166434-7	MW-25 (032219)	104	86	95	97
680-166434-8	MW-28 (032219)	103	86	95	97
680-166434-9	MW-29 (032219)	103	85	95	98
680-166434-10	TB-03 (032519)	101	85	93	96
LCS 680-565029/4	Lab Control Sample	102	88	96	96
LCS 680-565158/4	Lab Control Sample	95	90	93	95
LCSD 680-565029/5	Lab Control Sample Dup	101	87	95	94
LCSD 680-565158/5	Lab Control Sample Dup	100	95	99	99
MB 680-565029/8	Method Blank	103	85	94	96
MB 680-565158/10	Method Blank	90	90	97	91

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(32-113)	(26-109)	(32-118)	(27-110)	(10-126)	(39-124)
680-166434-1	BS-1 (032219)	76	57	70	63	37	74
LCS 680-564111/16-A	Lab Control Sample	76	52	66	56	75	79
MB 680-564111/15-A	Method Blank	49	41	50	35	44	55

Surrogate Legend

FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
TPHL = Terphenyl-d14
TBP = 2,4,6-Tribromophenol

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-565029/8
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 10:53	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 10:53	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 10:53	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 10:53	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 10:53	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 10:53	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 10:53	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 10:53	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 10:53	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 10:53	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 10:53	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 10:53	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 10:53	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 10:53	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 10:53	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 10:53	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 10:53	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 10:53	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 10:53	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 10:53	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 10:53	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 10:53	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 10:53	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 10:53	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 10:53	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 10:53	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 10:53	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 10:53	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 10:53	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565029/8
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 10:53	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 10:53	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 10:53	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 10:53	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 10:53	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 10:53	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 10:53	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 10:53	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 10:53	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 10:53	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 10:53	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 10:53	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 10:53	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 10:53	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 10:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 10:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 10:53*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 10:53*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/04/19 10:53*	*1*

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	265		ug/L		106	70 - 135
Benzene	50.0	50.2		ug/L		100	80 - 120
Bromobenzene	50.0	52.5		ug/L		105	80 - 121
Bromochloromethane	50.0	50.4		ug/L		101	80 - 120
Bromodichloromethane	50.0	49.2		ug/L		98	80 - 120
Bromoform	50.0	53.6		ug/L		107	74 - 126
Bromomethane	50.0	76.7	*	ug/L		153	62 - 130
2-Butanone	250	262		ug/L		105	80 - 131
Carbon disulfide	50.0	48.2		ug/L		96	80 - 120
Carbon tetrachloride	50.0	49.6		ug/L		99	76 - 123
Chlorobenzene	50.0	51.8		ug/L		104	80 - 120
Chloroethane	50.0	57.9		ug/L		116	66 - 135
2-Chloroethyl vinyl ether	50.0	49.4		ug/L		99	71 - 135
Chloroform	50.0	47.9		ug/L		96	80 - 120
Chloromethane	50.0	58.2		ug/L		116	69 - 131
2-Chlorotoluene	50.0	51.1		ug/L		102	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	51.4		ug/L		103	80 - 120
cis-1,2-Dichloroethene	50.0	49.4		ug/L		99	80 - 120
cis-1,3-Dichloropropene	50.0	51.3		ug/L		103	80 - 120
Dibromochloromethane	50.0	51.4		ug/L		103	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	52.4		ug/L		105	71 - 134
1,2-Dibromoethane	50.0	49.3		ug/L		99	80 - 120
Dibromomethane	50.0	49.5		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	49.7		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	49.6		ug/L		99	80 - 120
Dichlorodifluoromethane	50.0	49.7		ug/L		99	47 - 155
1,1-Dichloroethane	50.0	50.3		ug/L		101	80 - 120
1,2-Dichloroethane	50.0	44.2		ug/L		88	80 - 120
1,1-Dichloroethene	50.0	54.3		ug/L		109	76 - 120
1,2-Dichloroethene, Total	100	99.0		ug/L		99	80 - 120
1,2-Dichloropropane	50.0	51.4		ug/L		103	80 - 120
1,3-Dichloropropane	50.0	50.8		ug/L		102	80 - 120
2,2-Dichloropropane	50.0	51.8		ug/L		104	76 - 126
1,1-Dichloropropene	50.0	49.2		ug/L		98	80 - 120
Ethylbenzene	50.0	51.4		ug/L		103	80 - 120
Hexachlorobutadiene	50.0	50.4		ug/L		101	60 - 140
2-Hexanone	250	246		ug/L		99	74 - 127
Isopropylbenzene	50.0	52.3		ug/L		105	80 - 120
Methylene Chloride	50.0	48.0		ug/L		96	80 - 120
4-Methyl-2-pentanone	250	244		ug/L		98	76 - 124
Methyl tert-butyl ether	50.0	47.9		ug/L		96	80 - 120
m-Xylene & p-Xylene	50.0	51.2		ug/L		102	80 - 120
n-Butylbenzene	50.0	51.0		ug/L		102	80 - 120
N-Propylbenzene	50.0	52.5		ug/L		105	80 - 120
o-Xylene	50.0	51.6		ug/L		103	80 - 120
p-Isopropyltoluene	50.0	51.4		ug/L		103	80 - 120
sec-Butylbenzene	50.0	51.7		ug/L		103	80 - 120
Styrene	50.0	52.3		ug/L		105	80 - 120
tert-Butylbenzene	50.0	52.6		ug/L		105	80 - 121
1,1,1,2-Tetrachloroethane	50.0	52.2		ug/L		104	80 - 121
1,1,2,2-Tetrachloroethane	50.0	51.6		ug/L		103	80 - 120
Tetrachloroethene	50.0	52.3		ug/L		105	80 - 121
Toluene	50.0	50.7		ug/L		101	80 - 113
trans-1,2-Dichloroethene	50.0	49.6		ug/L		99	80 - 120
trans-1,3-Dichloropropene	50.0	51.0		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	49.0		ug/L		98	61 - 141
1,2,4-Trichlorobenzene	50.0	49.7		ug/L		99	68 - 128
1,1,1-Trichloroethane	50.0	47.5		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	51.2		ug/L		102	80 - 120
Trichloroethene	50.0	50.4		ug/L		101	80 - 120
Trichlorofluoromethane	50.0	53.8		ug/L		108	60 - 141
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 123
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120
1,3,5-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565029/4
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl acetate	100	114		ug/L		114	67 - 135
Vinyl chloride	50.0	57.1		ug/L		114	71 - 128
Xylenes, Total	100	103		ug/L		103	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*

Lab Sample ID: LCSD 680-565029/5
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	256		ug/L		102	70 - 135	3	30
Benzene	50.0	50.5		ug/L		101	80 - 120	1	20
Bromobenzene	50.0	51.7		ug/L		103	80 - 121	2	20
Bromochloromethane	50.0	49.5		ug/L		99	80 - 120	2	20
Bromodichloromethane	50.0	48.1		ug/L		96	80 - 120	2	20
Bromoform	50.0	51.5		ug/L		103	74 - 126	4	20
Bromomethane	50.0	73.3	*	ug/L		147	62 - 130	4	20
2-Butanone	250	249		ug/L		100	80 - 131	5	20
Carbon disulfide	50.0	49.6		ug/L		99	80 - 120	3	20
Carbon tetrachloride	50.0	51.0		ug/L		102	76 - 123	3	20
Chlorobenzene	50.0	50.6		ug/L		101	80 - 120	2	20
Chloroethane	50.0	58.4		ug/L		117	66 - 135	1	20
2-Chloroethyl vinyl ether	50.0	47.5		ug/L		95	71 - 135	4	50
Chloroform	50.0	47.8		ug/L		96	80 - 120	0	20
Chloromethane	50.0	59.1		ug/L		118	69 - 131	1	30
2-Chlorotoluene	50.0	51.3		ug/L		103	80 - 120	0	20
4-Chlorotoluene	50.0	50.7		ug/L		101	80 - 120	1	20
cis-1,2-Dichloroethene	50.0	49.9		ug/L		100	80 - 120	1	20
cis-1,3-Dichloropropene	50.0	50.4		ug/L		101	80 - 120	2	20
Dibromochloromethane	50.0	50.0		ug/L		100	80 - 121	3	20
1,2-Dibromo-3-Chloropropane	50.0	49.4		ug/L		99	71 - 134	6	20
1,2-Dibromoethane	50.0	48.2		ug/L		96	80 - 120	2	20
Dibromomethane	50.0	48.2		ug/L		96	80 - 120	3	20
1,2-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	2	20
1,3-Dichlorobenzene	50.0	48.6		ug/L		97	80 - 120	2	20
1,4-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120	2	20
Dichlorodifluoromethane	50.0	50.9		ug/L		102	47 - 155	2	40
1,1-Dichloroethane	50.0	51.1		ug/L		102	80 - 120	1	20
1,2-Dichloroethane	50.0	43.5		ug/L		87	80 - 120	2	50
1,1-Dichloroethene	50.0	55.7		ug/L		111	76 - 120	3	20
1,2-Dichloroethene, Total	100	99.9		ug/L		100	80 - 120	1	20
1,2-Dichloropropane	50.0	50.6		ug/L		101	80 - 120	2	20
1,3-Dichloropropane	50.0	48.8		ug/L		98	80 - 120	4	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565029/5
Matrix: Water
Analysis Batch: 565029

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,2-Dichloropropane	50.0	52.9		ug/L		106	76 - 126	2	20
1,1-Dichloropropene	50.0	50.9		ug/L		102	80 - 120	3	20
Ethylbenzene	50.0	51.3		ug/L		103	80 - 120	0	20
Hexachlorobutadiene	50.0	52.7		ug/L		105	60 - 140	5	20
2-Hexanone	250	233		ug/L		93	74 - 127	6	20
Isopropylbenzene	50.0	51.7		ug/L		103	80 - 120	1	20
Methylene Chloride	50.0	48.1		ug/L		96	80 - 120	0	20
4-Methyl-2-pentanone	250	230		ug/L		92	76 - 124	6	20
Methyl tert-butyl ether	50.0	46.6		ug/L		93	80 - 120	3	20
m-Xylene & p-Xylene	50.0	51.5		ug/L		103	80 - 120	1	20
n-Butylbenzene	50.0	50.9		ug/L		102	80 - 120	0	20
N-Propylbenzene	50.0	52.2		ug/L		104	80 - 120	1	20
o-Xylene	50.0	51.2		ug/L		102	80 - 120	1	30
p-Isopropyltoluene	50.0	52.0		ug/L		104	80 - 120	1	20
sec-Butylbenzene	50.0	52.4		ug/L		105	80 - 120	1	20
Styrene	50.0	51.7		ug/L		103	80 - 120	1	20
tert-Butylbenzene	50.0	52.5		ug/L		105	80 - 121	0	20
1,1,1,2-Tetrachloroethane	50.0	50.9		ug/L		102	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	49.1		ug/L		98	80 - 120	5	20
Tetrachloroethene	50.0	52.6		ug/L		105	80 - 121	1	20
Toluene	50.0	50.6		ug/L		101	80 - 113	0	20
trans-1,2-Dichloroethene	50.0	50.0		ug/L		100	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	49.2		ug/L		98	80 - 120	4	30
1,2,3-Trichlorobenzene	50.0	48.8		ug/L		98	61 - 141	0	20
1,2,4-Trichlorobenzene	50.0	49.9		ug/L		100	68 - 128	0	20
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	80 - 120	4	20
1,1,2-Trichloroethane	50.0	49.4		ug/L		99	80 - 120	4	20
Trichloroethene	50.0	50.6		ug/L		101	80 - 120	0	20
Trichlorofluoromethane	50.0	55.3		ug/L		111	60 - 141	3	20
1,2,3-Trichloropropane	50.0	49.1		ug/L		98	80 - 123	5	30
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	80 - 120	0	20
1,3,5-Trimethylbenzene	50.0	52.0		ug/L		104	80 - 120	1	20
Vinyl acetate	100	112		ug/L		112	67 - 135	2	20
Vinyl chloride	50.0	58.6		ug/L		117	71 - 128	3	20
Xylenes, Total	100	103		ug/L		103	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*
Dibromofluoromethane (Surr)	*95*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Lab Sample ID: MB 680-565158/10
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 22:19	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565158/10
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 22:19	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 22:19	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 22:19	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 22:19	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 22:19	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 22:19	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 22:19	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 22:19	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 22:19	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/04/19 22:19	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 22:19	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 22:19	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 22:19	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 22:19	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 22:19	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 22:19	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 22:19	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 22:19	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 22:19	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 22:19	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 22:19	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 22:19	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 22:19	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 22:19	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 22:19	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 22:19	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 22:19	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 22:19	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 22:19	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 22:19	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 22:19	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 22:19	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 22:19	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 22:19	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 22:19	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 22:19	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 22:19	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 22:19	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 22:19	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 22:19	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 22:19	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 22:19	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 22:19	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 22:19	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 22:19	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565158/10
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 22:19	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 22:19	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 22:19	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 22:19	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 22:19	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 22:19	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 22:19	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 22:19	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 22:19	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 22:19	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 22:19	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 22:19	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 22:19	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 22:19	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 22:19	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 22:19	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 22:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*80 - 120*		*04/04/19 22:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*		*04/04/19 22:19*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 122*		*04/04/19 22:19*	*1*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*		*04/04/19 22:19*	*1*

Lab Sample ID: LCS 680-565158/4
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	279		ug/L		112	70 - 135
Benzene	50.0	48.6		ug/L		97	80 - 120
Bromobenzene	50.0	50.5		ug/L		101	80 - 121
Bromochloromethane	50.0	49.0		ug/L		98	80 - 120
Bromodichloromethane	50.0	50.8		ug/L		102	80 - 120
Bromoform	50.0	49.6		ug/L		99	74 - 126
Bromomethane	50.0	45.2		ug/L		90	62 - 130
2-Butanone	250	252		ug/L		101	80 - 131
Carbon disulfide	50.0	49.7		ug/L		99	80 - 120
Carbon tetrachloride	50.0	49.0		ug/L		98	76 - 123
Chlorobenzene	50.0	50.2		ug/L		100	80 - 120
Chloroethane	50.0	51.5		ug/L		103	66 - 135
2-Chloroethyl vinyl ether	50.0	50.7		ug/L		101	71 - 135
Chloroform	50.0	48.3		ug/L		97	80 - 120
Chloromethane	50.0	59.1		ug/L		118	69 - 131
2-Chlorotoluene	50.0	49.7		ug/L		99	80 - 120
4-Chlorotoluene	50.0	49.6		ug/L		99	80 - 120
cis-1,2-Dichloroethene	50.0	46.7		ug/L		93	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565158/4
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	50.0	49.5		ug/L		99	80 - 120
Dibromochloromethane	50.0	47.8		ug/L		96	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	49.9		ug/L		100	71 - 134
1,2-Dibromoethane	50.0	49.4		ug/L		99	80 - 120
Dibromomethane	50.0	50.0		ug/L		100	80 - 120
1,2-Dichlorobenzene	50.0	51.9		ug/L		104	80 - 120
1,3-Dichlorobenzene	50.0	49.9		ug/L		100	80 - 120
1,4-Dichlorobenzene	50.0	50.4		ug/L		101	80 - 120
Dichlorodifluoromethane	50.0	62.6		ug/L		125	47 - 155
1,1-Dichloroethane	50.0	47.4		ug/L		95	80 - 120
1,2-Dichloroethane	50.0	47.3		ug/L		95	80 - 120
1,1-Dichloroethene	50.0	46.9		ug/L		94	76 - 120
1,2-Dichloroethene, Total	100	93.4		ug/L		93	80 - 120
1,2-Dichloropropane	50.0	48.6		ug/L		97	80 - 120
1,3-Dichloropropane	50.0	50.1		ug/L		100	80 - 120
2,2-Dichloropropane	50.0	44.8		ug/L		90	76 - 126
1,1-Dichloropropene	50.0	50.3		ug/L		101	80 - 120
Ethylbenzene	50.0	50.5		ug/L		101	80 - 120
Hexachlorobutadiene	50.0	48.6		ug/L		97	60 - 140
2-Hexanone	250	238		ug/L		95	74 - 127
Isopropylbenzene	50.0	49.7		ug/L		99	80 - 120
Methylene Chloride	50.0	48.3		ug/L		97	80 - 120
4-Methyl-2-pentanone	250	250		ug/L		100	76 - 124
Methyl tert-butyl ether	50.0	47.8		ug/L		96	80 - 120
m-Xylene & p-Xylene	50.0	50.3		ug/L		101	80 - 120
n-Butylbenzene	50.0	52.1		ug/L		104	80 - 120
N-Propylbenzene	50.0	51.2		ug/L		102	80 - 120
o-Xylene	50.0	50.7		ug/L		101	80 - 120
p-Isopropyltoluene	50.0	50.5		ug/L		101	80 - 120
sec-Butylbenzene	50.0	50.5		ug/L		101	80 - 120
Styrene	50.0	50.6		ug/L		101	80 - 120
tert-Butylbenzene	50.0	50.5		ug/L		101	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.5		ug/L		101	80 - 121
1,1,2,2-Tetrachloroethane	50.0	49.3		ug/L		99	80 - 120
Tetrachloroethene	50.0	49.7		ug/L		99	80 - 121
Toluene	50.0	47.9		ug/L		96	80 - 113
trans-1,2-Dichloroethene	50.0	46.7		ug/L		93	80 - 120
trans-1,3-Dichloropropene	50.0	53.5		ug/L		107	80 - 120
1,2,3-Trichlorobenzene	50.0	51.1		ug/L		102	61 - 141
1,2,4-Trichlorobenzene	50.0	51.9		ug/L		104	68 - 128
1,1,1-Trichloroethane	50.0	47.7		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	49.2		ug/L		98	80 - 120
Trichloroethene	50.0	50.6		ug/L		101	80 - 120
Trichlorofluoromethane	50.0	52.9		ug/L		106	60 - 141
1,2,3-Trichloropropane	50.0	48.4		ug/L		97	80 - 123
1,2,4-Trimethylbenzene	50.0	49.6		ug/L		99	80 - 120
1,3,5-Trimethylbenzene	50.0	49.6		ug/L		99	80 - 120
Vinyl acetate	100	96.5		ug/L		96	67 - 135
Vinyl chloride	50.0	52.8		ug/L		106	71 - 128

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565158/4
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Xylenes, Total			100	101		ug/L		101	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*95*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Dibromofluoromethane (Surr)	*93*		*80 - 122*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*

Lab Sample ID: LCSD 680-565158/5
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	292		ug/L		117	70 - 135	5	30
Benzene			50.0	51.2		ug/L		102	80 - 120	5	20
Bromobenzene			50.0	52.3		ug/L		105	80 - 121	3	20
Bromochloromethane			50.0	51.8		ug/L		104	80 - 120	6	20
Bromodichloromethane			50.0	52.8		ug/L		106	80 - 120	4	20
Bromoform			50.0	51.0		ug/L		102	74 - 126	3	20
Bromomethane			50.0	53.4		ug/L		107	62 - 130	17	20
2-Butanone			250	268		ug/L		107	80 - 131	6	20
Carbon disulfide			50.0	54.0		ug/L		108	80 - 120	8	20
Carbon tetrachloride			50.0	53.3		ug/L		107	76 - 123	8	20
Chlorobenzene			50.0	51.4		ug/L		103	80 - 120	2	20
Chloroethane			50.0	60.7		ug/L		121	66 - 135	16	20
2-Chloroethyl vinyl ether			50.0	52.1		ug/L		104	71 - 135	3	50
Chloroform			50.0	51.9		ug/L		104	80 - 120	7	20
Chloromethane			50.0	69.4	*	ug/L		139	69 - 131	16	30
2-Chlorotoluene			50.0	50.7		ug/L		101	80 - 120	2	20
4-Chlorotoluene			50.0	51.6		ug/L		103	80 - 120	4	20
cis-1,2-Dichloroethene			50.0	51.2		ug/L		102	80 - 120	9	20
cis-1,3-Dichloropropene			50.0	52.8		ug/L		106	80 - 120	6	20
Dibromochloromethane			50.0	52.0		ug/L		104	80 - 121	8	20
1,2-Dibromo-3-Chloropropane			50.0	49.7		ug/L		99	71 - 134	0	20
1,2-Dibromoethane			50.0	52.7		ug/L		105	80 - 120	6	20
Dibromomethane			50.0	52.7		ug/L		105	80 - 120	5	20
1,2-Dichlorobenzene			50.0	53.0		ug/L		106	80 - 120	2	20
1,3-Dichlorobenzene			50.0	50.7		ug/L		101	80 - 120	2	20
1,4-Dichlorobenzene			50.0	52.1		ug/L		104	80 - 120	3	20
Dichlorodifluoromethane			50.0	69.4		ug/L		139	47 - 155	10	40
1,1-Dichloroethane			50.0	51.5		ug/L		103	80 - 120	8	20
1,2-Dichloroethane			50.0	50.5		ug/L		101	80 - 120	6	50
1,1-Dichloroethene			50.0	50.9		ug/L		102	76 - 120	8	20
1,2-Dichloroethene, Total			100	103		ug/L		103	80 - 120	9	20
1,2-Dichloropropane			50.0	50.4		ug/L		101	80 - 120	4	20
1,3-Dichloropropane			50.0	52.4		ug/L		105	80 - 120	5	20
2,2-Dichloropropane			50.0	49.3		ug/L		99	76 - 126	10	20
1,1-Dichloropropene			50.0	53.2		ug/L		106	80 - 120	6	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565158/5
Matrix: Water
Analysis Batch: 565158

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene			50.0	51.6		ug/L		103	80 - 120	2	20
Hexachlorobutadiene			50.0	50.5		ug/L		101	60 - 140	4	20
2-Hexanone			250	253		ug/L		101	74 - 127	6	20
Isopropylbenzene			50.0	51.3		ug/L		103	80 - 120	3	20
Methylene Chloride			50.0	52.2		ug/L		104	80 - 120	8	20
4-Methyl-2-pentanone			250	251		ug/L		100	76 - 124	0	20
Methyl tert-butyl ether			50.0	51.3		ug/L		103	80 - 120	7	20
m-Xylene & p-Xylene			50.0	52.3		ug/L		105	80 - 120	4	20
n-Butylbenzene			50.0	54.2		ug/L		108	80 - 120	4	20
N-Propylbenzene			50.0	52.5		ug/L		105	80 - 120	2	20
o-Xylene			50.0	52.5		ug/L		105	80 - 120	4	30
p-Isopropyltoluene			50.0	52.2		ug/L		104	80 - 120	3	20
sec-Butylbenzene			50.0	51.8		ug/L		104	80 - 120	2	20
Styrene			50.0	52.3		ug/L		105	80 - 120	3	20
tert-Butylbenzene			50.0	51.4		ug/L		103	80 - 121	2	20
1,1,1,2-Tetrachloroethane			50.0	51.6		ug/L		103	80 - 121	2	20
1,1,2,2-Tetrachloroethane			50.0	49.4		ug/L		99	80 - 120	0	20
Tetrachloroethene			50.0	53.0		ug/L		106	80 - 121	6	20
Toluene			50.0	50.9		ug/L		102	80 - 113	6	20
trans-1,2-Dichloroethene			50.0	51.4		ug/L		103	80 - 120	10	20
trans-1,3-Dichloropropene			50.0	54.9		ug/L		110	80 - 120	3	30
1,2,3-Trichlorobenzene			50.0	52.3		ug/L		105	61 - 141	2	20
1,2,4-Trichlorobenzene			50.0	52.6		ug/L		105	68 - 128	1	20
1,1,1-Trichloroethane			50.0	51.1		ug/L		102	80 - 120	7	20
1,1,2-Trichloroethane			50.0	52.3		ug/L		105	80 - 120	6	20
Trichloroethene			50.0	53.6		ug/L		107	80 - 120	6	20
Trichlorofluoromethane			50.0	62.5		ug/L		125	60 - 141	17	20
1,2,3-Trichloropropane			50.0	49.6		ug/L		99	80 - 123	2	30
1,2,4-Trimethylbenzene			50.0	50.7		ug/L		101	80 - 120	2	20
1,3,5-Trimethylbenzene			50.0	50.9		ug/L		102	80 - 120	2	20
Vinyl acetate			100	105		ug/L		105	67 - 135	8	20
Vinyl chloride			50.0	60.0		ug/L		120	71 - 128	13	20
Xylenes, Total			100	105		ug/L		105	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-564111/15-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564111

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:46	1
Acenaphthylene	<10		10	0.85	ug/L		03/28/19 16:10	03/29/19 15:46	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564111/15-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564111

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetophenone	<10		10	0.57	ug/L		03/28/19 16:10	03/29/19 15:46	1
Anthracene	<10		10	0.69	ug/L		03/28/19 16:10	03/29/19 15:46	1
Atrazine	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzaldehyde	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzo[a]anthracene	<10		10	0.55	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzo[a]pyrene	<10		10	0.71	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzo[b]fluoranthene	<10		10	2.6	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzo[g,h,i]perylene	<10		10	0.87	ug/L		03/28/19 16:10	03/29/19 15:46	1
Benzo[k]fluoranthene	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
1,1'-Biphenyl	<10		10	0.58	ug/L		03/28/19 16:10	03/29/19 15:46	1
Bis(2-chloroethoxy)methane	<10		10	0.94	ug/L		03/28/19 16:10	03/29/19 15:46	1
Bis(2-chloroethyl)ether	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:46	1
bis (2-chloroisopropyl) ether	<10		10	0.78	ug/L		03/28/19 16:10	03/29/19 15:46	1
Bis(2-ethylhexyl) phthalate	<10		10	1.6	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Bromophenyl phenyl ether	<10		10	0.77	ug/L		03/28/19 16:10	03/29/19 15:46	1
Butyl benzyl phthalate	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
Caprolactam	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:46	1
Carbazole	<10		10	0.71	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Chloroaniline	<20		20	2.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Chloro-3-methylphenol	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
2-Chloronaphthalene	<10		10	0.80	ug/L		03/28/19 16:10	03/29/19 15:46	1
2-Chlorophenol	<10		10	0.87	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Chlorophenyl phenyl ether	<10		10	0.84	ug/L		03/28/19 16:10	03/29/19 15:46	1
Chrysene	<10		10	0.51	ug/L		03/28/19 16:10	03/29/19 15:46	1
Dibenz(a,h)anthracene	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
Dibenzofuran	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:46	1
1,2-Dichlorobenzene	<10		10	0.53	ug/L		03/28/19 16:10	03/29/19 15:46	1
1,3-Dichlorobenzene	<10		10	0.59	ug/L		03/28/19 16:10	03/29/19 15:46	1
1,4-Dichlorobenzene	<10		10	0.54	ug/L		03/28/19 16:10	03/29/19 15:46	1
3,3'-Dichlorobenzidine	<60		60	30	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4-Dichlorophenol	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:46	1
Diethyl phthalate	<10		10	0.88	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4-Dimethylphenol	<10		10	4.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
Dimethyl phthalate	<10		10	0.99	ug/L		03/28/19 16:10	03/29/19 15:46	1
Di-n-butyl phthalate	<10		10	0.83	ug/L		03/28/19 16:10	03/29/19 15:46	1
4,6-Dinitro-2-methylphenol	<50		50	10	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4-Dinitrophenol	<50		50	10	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4-Dinitrotoluene	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,6-Dinitrotoluene	<10		10	1.1	ug/L		03/28/19 16:10	03/29/19 15:46	1
Di-n-octyl phthalate	<10		10	1.4	ug/L		03/28/19 16:10	03/29/19 15:46	1
Fluoranthene	<10		10	0.74	ug/L		03/28/19 16:10	03/29/19 15:46	1
Fluorene	<10		10	0.96	ug/L		03/28/19 16:10	03/29/19 15:46	1
Hexachlorobenzene	<10		10	0.79	ug/L		03/28/19 16:10	03/29/19 15:46	1
Hexachlorobutadiene	<10		10	0.62	ug/L		03/28/19 16:10	03/29/19 15:46	1
Hexachlorocyclopentadiene	<10		10	2.5	ug/L		03/28/19 16:10	03/29/19 15:46	1
Hexachloroethane	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:46	1
Indeno[1,2,3-cd]pyrene	<10		10	1.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
Isophorone	<10		10	0.90	ug/L		03/28/19 16:10	03/29/19 15:46	1
2-Methylnaphthalene	<10		10	0.78	ug/L		03/28/19 16:10	03/29/19 15:46	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564111/15-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564111

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	<10		10	0.89	ug/L		03/28/19 16:10	03/29/19 15:46	1
3 & 4 Methylphenol	<10		10	1.3	ug/L		03/28/19 16:10	03/29/19 15:46	1
2-Nitroaniline	<50		50	1.3	ug/L		03/28/19 16:10	03/29/19 15:46	1
3-Nitroaniline	<50		50	5.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Nitroaniline	<50		50	5.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
Nitrobenzene	<10		10	0.73	ug/L		03/28/19 16:10	03/29/19 15:46	1
2-Nitrophenol	<10		10	0.76	ug/L		03/28/19 16:10	03/29/19 15:46	1
4-Nitrophenol	<50		50	1.9	ug/L		03/28/19 16:10	03/29/19 15:46	1
N-Nitrosodi-n-propylamine	<10		10	0.72	ug/L		03/28/19 16:10	03/29/19 15:46	1
N-Nitrosodiphenylamine	<10		10	0.92	ug/L		03/28/19 16:10	03/29/19 15:46	1
Pentachlorophenol	<50		50	2.0	ug/L		03/28/19 16:10	03/29/19 15:46	1
Phenanthrene	<10		10	0.77	ug/L		03/28/19 16:10	03/29/19 15:46	1
Phenol	<10		10	0.83	ug/L		03/28/19 16:10	03/29/19 15:46	1
Pyrene	<10		10	0.63	ug/L		03/28/19 16:10	03/29/19 15:46	1
1,2,4-Trichlorobenzene	<10		10	0.56	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4,5-Trichlorophenol	<10		10	1.2	ug/L		03/28/19 16:10	03/29/19 15:46	1
2,4,6-Trichlorophenol	<10		10	0.85	ug/L		03/28/19 16:10	03/29/19 15:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*49*		*32 - 113*	*03/28/19 16:10*	*03/29/19 15:46*	*1*
2-Fluorophenol	*41*		*26 - 109*	*03/28/19 16:10*	*03/29/19 15:46*	*1*
Nitrobenzene-d5	*50*		*32 - 118*	*03/28/19 16:10*	*03/29/19 15:46*	*1*
Phenol-d5	*35*		*27 - 110*	*03/28/19 16:10*	*03/29/19 15:46*	*1*
Terphenyl-d14	*44*		*10 - 126*	*03/28/19 16:10*	*03/29/19 15:46*	*1*
2,4,6-Tribromophenol	*55*		*39 - 124*	*03/28/19 16:10*	*03/29/19 15:46*	*1*

Lab Sample ID: LCS 680-564111/16-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564111

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	100	81.5		ug/L		82	48 - 130
Acenaphthylene	100	78.5		ug/L		78	48 - 130
Anthracene	100	75.1		ug/L		75	49 - 130
Atrazine	100	68.9		ug/L		69	39 - 130
Benzaldehyde	100	40.1		ug/L		40	14 - 130
Benzo[a]anthracene	100	82.9		ug/L		83	44 - 130
Benzo[a]pyrene	100	76.5		ug/L		77	44 - 130
Benzo[b]fluoranthene	100	81.5		ug/L		82	43 - 130
Benzo[g,h,i]perylene	100	72.7		ug/L		73	41 - 130
Benzo[k]fluoranthene	100	84.1		ug/L		84	40 - 130
1,1'-Biphenyl	100	82.9		ug/L		83	45 - 130
Bis(2-chloroethoxy)methane	100	65.6		ug/L		66	47 - 130
Bis(2-chloroethyl)ether	100	69.9		ug/L		70	32 - 130
bis (2-chloroisopropyl) ether	100	58.2		ug/L		58	26 - 130
Bis(2-ethylhexyl) phthalate	100	81.7		ug/L		82	45 - 130
4-Bromophenyl phenyl ether	100	75.0		ug/L		75	47 - 130
Butyl benzyl phthalate	100	81.0		ug/L		81	50 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564111/16-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564111

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Caprolactam	100	66.4		ug/L		66	26 - 130
Carbazole	100	78.3		ug/L		78	54 - 130
4-Chloroaniline	100	70.4		ug/L		70	42 - 130
4-Chloro-3-methylphenol	100	74.1		ug/L		74	47 - 130
2-Chloronaphthalene	100	79.5		ug/L		79	44 - 130
2-Chlorophenol	100	64.8		ug/L		65	39 - 130
4-Chlorophenyl phenyl ether	100	81.0		ug/L		81	45 - 130
Chrysene	100	84.1		ug/L		84	47 - 130
Dibenz(a,h)anthracene	100	77.2		ug/L		77	41 - 130
Dibenzofuran	100	82.8		ug/L		83	50 - 130
1,2-Dichlorobenzene	100	60.1		ug/L		60	31 - 130
1,3-Dichlorobenzene	100	56.9		ug/L		57	30 - 130
1,4-Dichlorobenzene	100	56.8		ug/L		57	31 - 130
3,3'-Dichlorobenzidine	100	79.3		ug/L		79	46 - 130
2,4-Dichlorophenol	100	79.5		ug/L		80	44 - 130
Diethyl phthalate	100	82.4		ug/L		82	53 - 130
2,4-Dimethylphenol	100	71.2		ug/L		71	37 - 130
Dimethyl phthalate	100	83.7		ug/L		84	53 - 130
Di-n-butyl phthalate	100	74.9		ug/L		75	51 - 130
4,6-Dinitro-2-methylphenol	200	177		ug/L		89	42 - 130
2,4-Dinitrophenol	200	187		ug/L		93	31 - 130
2,4-Dinitrotoluene	100	88.4		ug/L		88	52 - 130
2,6-Dinitrotoluene	100	83.4		ug/L		83	52 - 130
Di-n-octyl phthalate	100	83.8		ug/L		84	42 - 130
Fluoranthene	100	77.8		ug/L		78	47 - 130
Fluorene	100	79.9		ug/L		80	50 - 130
Hexachlorobenzene	100	71.5		ug/L		71	43 - 130
Hexachlorobutadiene	100	63.2		ug/L		63	27 - 130
Hexachlorocyclopentadiene	100	33.2		ug/L		33	11 - 130
Hexachloroethane	100	51.3		ug/L		51	29 - 130
Indeno[1,2,3-cd]pyrene	100	74.7		ug/L		75	31 - 130
Isophorone	100	67.5		ug/L		67	47 - 130
2-Methylnaphthalene	100	80.2		ug/L		80	40 - 130
2-Methylphenol	100	65.4		ug/L		65	40 - 130
3 & 4 Methylphenol	100	60.9		ug/L		61	42 - 130
2-Nitroaniline	100	82.6		ug/L		83	51 - 130
3-Nitroaniline	100	73.7		ug/L		74	53 - 130
4-Nitroaniline	100	61.1		ug/L		61	49 - 130
Nitrobenzene	100	68.9		ug/L		69	43 - 130
2-Nitrophenol	100	83.6		ug/L		84	43 - 130
4-Nitrophenol	200	178		ug/L		89	44 - 130
N-Nitrosodi-n-propylamine	100	55.4		ug/L		55	42 - 130
N-Nitrosodiphenylamine	100	78.7		ug/L		79	50 - 130
Pentachlorophenol	200	166		ug/L		83	33 - 130
Phenanthrene	100	76.7		ug/L		77	51 - 130
Phenol	100	58.1		ug/L		58	35 - 130
Pyrene	100	87.3		ug/L		87	52 - 130
1,2,4-Trichlorobenzene	100	69.0		ug/L		69	33 - 130
2,4,5-Trichlorophenol	100	86.5		ug/L		87	48 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564111/16-A
Matrix: Water
Analysis Batch: 564307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564111

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4,6-Trichlorophenol			100	83.8		ug/L		84	47 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*76*		*32 - 113*
2-Fluorophenol	*52*		*26 - 109*
Nitrobenzene-d5	*66*		*32 - 118*
Phenol-d5	*56*		*27 - 110*
Terphenyl-d14	*75*		*10 - 126*
2,4,6-Tribromophenol	*79*		*39 - 124*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-565520/34
Matrix: Water
Analysis Batch: 565520

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/08/19 21:41	1

Lab Sample ID: LCS 680-565520/35
Matrix: Water
Analysis Batch: 565520

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			10.0	9.98		mg/L		100	90 - 110		

Lab Sample ID: LCSD 680-565520/36
Matrix: Water
Analysis Batch: 565520

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate			10.0	10.0		mg/L		100	90 - 110	0	15

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 550-173992/4
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/03/19 20:47	1

Lab Sample ID: LCS 550-173992/6
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perchlorate			25.0	22.8		ug/L		91	85 - 115		

Method: 314.0 - Perchlorate (IC) (Continued)

Lab Sample ID: LCSD 550-173992/10
Matrix: Water
Analysis Batch: 173992

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate			25.0	24.6		ug/L		98	85 - 115	7	15

Lab Sample ID: 680-166434-1 MS
Matrix: Water
Analysis Batch: 173992

Client Sample ID: BS-1 (032219)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	<1.0		25.0	25.4		ug/L		101	80 - 120

Lab Sample ID: 680-166434-1 MSD
Matrix: Water
Analysis Batch: 173992

Client Sample ID: BS-1 (032219)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	<1.0		25.0	26.2		ug/L		105	80 - 120	3	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-564725/1-A
Matrix: Water
Analysis Batch: 564904

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564725

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/02/19 11:24	04/03/19 00:33	1

Lab Sample ID: LCS 680-564725/2-A
Matrix: Water
Analysis Batch: 564904

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564725

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron			5000	5310		ug/L		106	80 - 120

Lab Sample ID: MB 680-564743/1-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564743

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<200		200	24	ug/L		04/02/19 12:50	04/04/19 19:18	1
Antimony	<20		20	5.3	ug/L		04/02/19 12:50	04/04/19 19:18	1
Arsenic	<20		20	6.2	ug/L		04/02/19 12:50	04/04/19 19:18	1
Barium	<10		10	1.7	ug/L		04/02/19 12:50	04/04/19 19:18	1
Beryllium	<4.0		4.0	0.10	ug/L		04/02/19 12:50	04/04/19 19:18	1
Cadmium	<5.0		5.0	1.0	ug/L		04/02/19 12:50	04/04/19 19:18	1
Calcium	<500		500	25	ug/L		04/02/19 12:50	04/04/19 19:18	1
Chromium	<10		10	1.6	ug/L		04/02/19 12:50	04/04/19 19:18	1
Cobalt	<10		10	1.0	ug/L		04/02/19 12:50	04/04/19 19:18	1
Copper	2.35	J	20	1.8	ug/L		04/02/19 12:50	04/04/19 19:18	1
Iron	<50		50	17	ug/L		04/02/19 12:50	04/04/19 19:18	1
Lead	<10		10	3.9	ug/L		04/02/19 12:50	04/04/19 19:18	1
Magnesium	<500		500	33	ug/L		04/02/19 12:50	04/04/19 19:18	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-564743/1-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564743

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	<10		10	1.0	ug/L		04/02/19 12:50	04/04/19 19:18	1
Nickel	<40		40	2.1	ug/L		04/02/19 12:50	04/04/19 19:18	1
Potassium	<1000		1000	17	ug/L		04/02/19 12:50	04/04/19 19:18	1
Selenium	11.3	J	20	9.9	ug/L		04/02/19 12:50	04/04/19 19:18	1
Silver	<10		10	0.60	ug/L		04/02/19 12:50	04/04/19 19:18	1
Sodium	<1000		1000	480	ug/L		04/02/19 12:50	04/04/19 19:18	1
Thallium	<25		25	6.0	ug/L		04/02/19 12:50	04/04/19 19:18	1
Vanadium	<10		10	1.0	ug/L		04/02/19 12:50	04/04/19 19:18	1
Zinc	<20		20	7.0	ug/L		04/02/19 12:50	04/04/19 19:18	1

Lab Sample ID: LCS 680-564743/2-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564743

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5040		ug/L		101	80 - 120
Antimony	50.0	51.4		ug/L		103	80 - 120
Arsenic	100	104		ug/L		104	80 - 120
Barium	100	98.0		ug/L		98	80 - 120
Beryllium	50.0	53.4		ug/L		107	80 - 120
Cadmium	50.0	52.1		ug/L		104	80 - 120
Calcium	5000	4970		ug/L		99	80 - 120
Chromium	100	102		ug/L		102	80 - 120
Cobalt	50.0	50.5		ug/L		101	80 - 120
Copper	100	107		ug/L		107	80 - 120
Iron	5000	5060		ug/L		101	80 - 120
Lead	500	501		ug/L		100	80 - 120
Magnesium	5000	5100		ug/L		102	80 - 120
Manganese	500	503		ug/L		101	80 - 120
Nickel	100	102		ug/L		102	80 - 120
Potassium	8000	8160		ug/L		102	80 - 120
Selenium	100	115		ug/L		115	80 - 120
Silver	50.0	52.0		ug/L		104	80 - 120
Sodium	5000	5330		ug/L		107	80 - 120
Thallium	40.0	32.4		ug/L		81	80 - 120
Vanadium	100	101		ug/L		101	80 - 120
Zinc	100	108		ug/L		108	80 - 120

Lab Sample ID: 680-166434-8 MS
Matrix: Water
Analysis Batch: 564904

Client Sample ID: MW-28 (032219)
Prep Type: Dissolved
Prep Batch: 564725

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron	14000	F1	5000	16700	F1	ug/L		52	75 - 125

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-166434-8 MSD — **Client Sample ID: MW-28 (032219)**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 564904 — **Prep Batch: 564725**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Iron	14000	F1	5000	16300	F1	ug/L		46	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-564953/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 565380 — **Prep Batch: 564953**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/03/19 14:17	04/05/19 20:36	1

Lab Sample ID: LCS 680-564953/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 565380 — **Prep Batch: 564953**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.15		ug/L		86	80 - 120

Method: 5310 B-2011 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-565397/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 565397

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/07/19 02:18	1

Lab Sample ID: LCS 680-565397/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 565397

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.6		mg/L		98	80 - 120

Lab Sample ID: LCSD 680-565397/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 565397

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	20.0		mg/L		100	80 - 120	2	25

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

GC/MS VOA

Analysis Batch: 565029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	8260B	
680-166434-4	MW-19 (032219)	Total/NA	Water	8260B	
680-166434-5	MW-23 (032219)	Total/NA	Water	8260B	
680-166434-6	DUP03 (032219)	Total/NA	Water	8260B	
680-166434-7	MW-25 (032219)	Total/NA	Water	8260B	
680-166434-8	MW-28 (032219)	Total/NA	Water	8260B	
680-166434-9	MW-29 (032219)	Total/NA	Water	8260B	
680-166434-10	TB-03 (032519)	Total/NA	Water	8260B	
MB 680-565029/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565029/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565029/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565158

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-2	MW-5 (032219)	Total/NA	Water	8260B	
MB 680-565158/10	Method Blank	Total/NA	Water	8260B	
LCS 680-565158/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565158/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 564111

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	3520C	
MB 680-564111/15-A	Method Blank	Total/NA	Water	3520C	
LCS 680-564111/16-A	Lab Control Sample	Total/NA	Water	3520C	

Analysis Batch: 564307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	8270D	564111
MB 680-564111/15-A	Method Blank	Total/NA	Water	8270D	564111
LCS 680-564111/16-A	Lab Control Sample	Total/NA	Water	8270D	564111

HPLC/IC

Analysis Batch: 173992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	314.0	
680-166434-2	MW-5 (032219)	Total/NA	Water	314.0	
680-166434-4	MW-19 (032219)	Total/NA	Water	314.0	
680-166434-5	MW-23 (032219)	Total/NA	Water	314.0	
680-166434-6	DUP03 (032219)	Total/NA	Water	314.0	
680-166434-7	MW-25 (032219)	Total/NA	Water	314.0	
680-166434-8	MW-28 (032219)	Total/NA	Water	314.0	
680-166434-9	MW-29 (032219)	Total/NA	Water	314.0	
MB 550-173992/4	Method Blank	Total/NA	Water	314.0	
LCS 550-173992/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-173992/10	Lab Control Sample Dup	Total/NA	Water	314.0	
680-166434-1 MS	BS-1 (032219)	Total/NA	Water	314.0	
680-166434-1 MSD	BS-1 (032219)	Total/NA	Water	314.0	

HPLC/IC

Analysis Batch: 565520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	300.0-1993 R2.1	
680-166434-7	MW-25 (032219)	Total/NA	Water	300.0-1993 R2.1	
680-166434-8	MW-28 (032219)	Total/NA	Water	300.0-1993 R2.1	
MB 680-565520/34	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-565520/35	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-565520/36	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Prep Batch: 564725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Dissolved	Water	3005A	
680-166434-7	MW-25 (032219)	Dissolved	Water	3005A	
680-166434-8	MW-28 (032219)	Dissolved	Water	3005A	
MB 680-564725/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564725/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-166434-8 MS	MW-28 (032219)	Dissolved	Water	3005A	
680-166434-8 MSD	MW-28 (032219)	Dissolved	Water	3005A	

Prep Batch: 564743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total Recoverable	Water	3005A	
MB 680-564743/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564743/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 564904

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Dissolved	Water	6010C	564725
680-166434-7	MW-25 (032219)	Dissolved	Water	6010C	564725
680-166434-8	MW-28 (032219)	Dissolved	Water	6010C	564725
MB 680-564725/1-A	Method Blank	Total Recoverable	Water	6010C	564725
LCS 680-564725/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564725
680-166434-8 MS	MW-28 (032219)	Dissolved	Water	6010C	564725
680-166434-8 MSD	MW-28 (032219)	Dissolved	Water	6010C	564725

Prep Batch: 564953

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	7470A	
MB 680-564953/1-A	Method Blank	Total/NA	Water	7470A	
LCS 680-564953/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 565240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total Recoverable	Water	6010C	564743
MB 680-564743/1-A	Method Blank	Total Recoverable	Water	6010C	564743
LCS 680-564743/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564743

Analysis Batch: 565380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	7470A	564953
MB 680-564953/1-A	Method Blank	Total/NA	Water	7470A	564953

Metals (Continued)

Analysis Batch: 565380 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-564953/2-A	Lab Control Sample	Total/NA	Water	7470A	564953

General Chemistry

Analysis Batch: 563765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-3	MW-11 (032219)	Total/NA	Water	Total Nitrogen	

Analysis Batch: 565397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166434-1	BS-1 (032219)	Total/NA	Water	5310 B-2011	
680-166434-7	MW-25 (032219)	Total/NA	Water	5310 B-2011	
680-166434-8	MW-28 (032219)	Total/NA	Water	5310 B-2011	
MB 680-565397/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-565397/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-565397/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219)

Lab Sample ID: 680-166434-1

Date Collected: 03/22/19 12:30
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 12:10	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3520C			1037 mL	1 mL	564111	03/28/19 16:10	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564307	03/29/19 20:30	DBM	TAL SAV
	Instrument ID: CMSG									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565520	04/08/19 23:22	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			173992	04/03/19 21:56	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564725	04/02/19 11:24	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564904	04/03/19 01:15	BCB	TAL SAV
	Instrument ID: ICPE									
Total Recoverable	Prep	3005A			50 mL	50 mL	564743	04/02/19 12:50	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1			565240	04/04/19 19:55	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	7470A			50 mL	50 mL	564953	04/03/19 14:17	PEP	TAL SAV
Total/NA	Analysis	7470A		1			565380	04/05/19 22:20	PEP	TAL SAV
	Instrument ID: LEEMAN2									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565397	04/07/19 07:16	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: MW-5 (032219)

Lab Sample ID: 680-166434-2

Date Collected: 03/22/19 14:00
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565158	04/05/19 02:17	UI	TAL SAV
	Instrument ID: CMSA2									
Total/NA	Analysis	314.0		1			173992	04/03/19 23:28	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: MW-11 (032219)

Lab Sample ID: 680-166434-3

Date Collected: 03/22/19 13:00
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Total Nitrogen		1			563765	03/26/19 15:01	ALG	TAL SAV
	Instrument ID: NOEQUIP									

Client Sample ID: MW-19 (032219)

Lab Sample ID: 680-166434-4

Date Collected: 03/22/19 14:45
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 15:36	JLK	TAL SAV
	Instrument ID: CMSP2									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-19 (032219)

Lab Sample ID: 680-166434-4
Matrix: Water
Date Collected: 03/22/19 14:45
Date Received: 03/26/19 08:58

Client Sample ID: MW-23 (032219)

Lab Sample ID: 680-166434-5
Matrix: Water
Date Collected: 03/22/19 10:30
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 13:28	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		1			173992	04/04/19 00:14	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: DUP03 (032219)

Lab Sample ID: 680-166434-6
Matrix: Water
Date Collected: 03/22/19 12:00
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 13:53	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		1			173992	04/04/19 00:36	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: MW-25 (032219)

Lab Sample ID: 680-166434-7
Matrix: Water
Date Collected: 03/22/19 15:40
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 14:19	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565520	04/08/19 23:35	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		10			173992	04/04/19 17:50	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564725	04/02/19 11:24	AJR	TAL SAV
Dissolved	Analysis	6010C		1			564904	04/03/19 01:10	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	565397	04/07/19 08:31	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: MW-28 (032219)

Lab Sample ID: 680-166434-8
Matrix: Water
Date Collected: 03/22/19 10:25
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 14:45	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565520	04/08/19 23:47	UI	TAL SAV
	Instrument ID: CICK									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Job ID: 680-166434-1
Project/Site: ATK Orbital Elkton

Client Sample ID: MW-28 (032219)
Lab Sample ID: 680-166434-8

Date Collected: 03/22/19 10:25
Matrix: Water
Date Received: 03/26/19 08:58

Dissolved	Prep	3005A		50 mL	50 mL	564725	04/02/19 11:24	AJR	TAL SAV
Dissolved	Analysis	6010C	1			564904	04/03/19 00:44	BCB	TAL SAV
	Instrument ID: ICPE								
Total/NA	Analysis	5310 B-2011	1	40 mL	40 mL	565397	04/07/19 08:56	KDM	TAL SAV
	Instrument ID: TOC7								

Client Sample ID: MW-29 (032219)
Lab Sample ID: 680-166434-9

Date Collected: 03/22/19 11:40
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 15:10	JLK	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Analysis	314.0		200			173992	04/04/19 23:11	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: TB-03 (032519)
Lab Sample ID: 680-166434-10

Date Collected: 03/22/19 00:00
Matrix: Water
Date Received: 03/26/19 08:58

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565029	04/04/19 11:19	JLK	TAL SAV
	Instrument ID: CMSP2									

Laboratory References:

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Baltimore #201

Chain of Custody Record 309995

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zambito	Date: 3/22/2019	COC No:
Company Name: Arcadis IAC	Tel/Fax:	Lab Contact:	Carrier:	1 of ____ COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler:
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital	☐ 1 week			Job / SDG No.:
Site: Elkton, MD	☐ 2 days			
PO# MD001606.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOCs	8270D-SVOC	6010C - Dissolved Iron	SM5310_TOC_B	300.0_28D	Total Nitrogen_353.2_351.2	314.0 - Perchlorate	6010C - Total metals	Sample Specific Notes:
BS-1(032219)	3/22/19	1230		GW	11			3	1	1	3	1		1	1	
MW-5(032219)		1400		GW	4			3						1	X KM	
MW-11(032219)		1300		GW	1								1			
MW-19(032219)		1445		GW	4			3						1		
MW-23(032219)		1030		GW	4			3						1		
DUP03(032219)		1200		GW	4			3						1		
MW-25(032219)		1540		GW	9			3		1	3	1		1		
MW-28(032219)		1025		GW	9			3		1	3	1		1		
MW-29(032219)	↓	1140		GW	4			3						1		
TB-03(032519)					2			2								

680-166434 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

1.4 1.6 CW IR35

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ | Therm ID No.: ____

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis		Received by:	TA	3/25/19 1230
Relinquished by:	TA	3/25/19 1700	Received by:		
Relinquished by:			Received in Laboratory by:	TASTAV	3/26/19 858

4/9/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559197.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166434-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/5/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
BS-1 (032219) (680-166434-1)	3/22/19	12:30 Eastern		Water			X	1	
MW-5 (032219) (680-166434-2)	3/22/19	14:00 Eastern		Water			X	1	
MW-19 (032219) (680-166434-4)	3/22/19	14:45 Eastern		Water			X	1	
MW-23 (032219) (680-166434-5)	3/22/19	10:30 Eastern		Water			X	1	
DUP03 (032219) (680-166434-6)	3/22/19	12:00 Eastern		Water			X	1	
MW-25 (032219) (680-166434-7)	3/22/19	15:40 Eastern		Water			X	1	
MW-28 (032219) (680-166434-8)	3/22/19	10:25 Eastern		Water			X	1	
MW-29 (032219) (680-166434-9)	3/22/19	11:40 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	3-26-19 1645	TAL SAV	[signature]		
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	3-27-19 0945	TAL-SAV

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: (2.4°C) RTD

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166434-1

Login Number: 166434

List Source: Eurofins TestAmerica, Savannah

List Number: 1

Creator: Weston, Pamela

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166434-1

Login Number: 166434
List Number: 2
Creator: Doerr, Bret C

List Source: Eurofins TestAmerica, Phoenix
List Creation: 03/27/19 02:05 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	250	12-31-19

Laboratory: Eurofins TestAmerica, Phoenix

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP		154268	07-01-19
AIHA-LAP, LLC	IHLAP		154268	07-01-19
Arizona	State Program	9	AZ0728	06-09-19
California	LA Cty Sanitation Districts	9	9254471	04-10-19 *
California	State Program	9	2941	03-09-19 *
Nevada	State Program	9	AZ01030	07-31-19
Oregon	NELAP	10	AZ100001	03-09-20
USDA	Federal		P330-16-00302	08-27-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-166589-1
Client Project/Site: ATK Orbital Elkton

For:
ARCADIS U.S., Inc.
7550 Teague Road
Suite 210
Hanover, Maryland 21076

Attn: Ms. Tina Armstrong

Authorized for release by:
4/18/2019 9:23:35 AM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 680-166589-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: ATK Orbital Elkton

Report Number: 680-166589-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 03/28/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.5º C and 4.4º C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples GM-21M (032519) (680-166589-1), GM-21S (032519) (680-166589-2), GM-22M (032519) (680-166589-3), GM-22S (032519) (680-166589-4), GM-32 (032519) (680-166589-5), GM-32D (032519) (680-166589-6), DUP04 (032519) (680-166589-7), TB-05 (680-166589-8), EB-02 (032519) (680-166589-9), GM-2B (032619) (680-166589-10), GM-16M (032619) (680-166589-11), GM-16S (032619) (680-166589-12), GM-26M (032619) (680-166589-13), GM-26S (032619) (680-166589-14), GM-30M (032619) (680-166589-15), GM-31M (032619) (680-166589-16), GM-31S (032619) (680-166589-17) and DUP05 (032619) (680-166589-18) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 04/05/2019, 04/06/2019 and 04/09/2019.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-565539 recovered outside control limits for the following analytes: Bromomethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

The following analyte(s) recovered outside control limits for the LCSD associated with analytical batch 680-565539: 1,1-Dichloroethene. This is not indicative of a systematic control problem because these were random marginal exceedances. Qualified results have been reported.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 680-565539 recovered outside control limits for the following analytes: 1,1-Dichloroethene.

The trip blank associated with job number 680-166589-1 indicated a detection above the reporting limit (RL for the following analyte): Acetone and trichloroethene. Reanalysis confirmed the presence of Acetone.
EB-02 (032519) (680-166589-9)

The following sample had an estimated detection for trichloroethene that is probably the result of carry over from the previous injection. The sample was rerun out of hold. Both sets of data have been reported.

EB-02 (032519) (680-166589-9)

Bromomethane failed the recovery criteria high for LCS 680-565539/4. 1,1-Dichloroethene and Bromomethane failed the recovery criteria high for LCSD 680-565539/5. Refer to the QC report for details.

Job ID: 680-166589-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Samples GM-21S (032519) (680-166589-2)[10X], GM-22M (032519) (680-166589-3)[10X], GM-22S (032519) (680-166589-4)[10X] and GM-16S (032619) (680-166589-12)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-565204, 680-565285, and 680-565539.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS BY GCMS - LOW LEVEL

Samples GM-21M (032519) (680-166589-1), GM-21S (032519) (680-166589-2), GM-22M (032519) (680-166589-3), GM-22S (032519) (680-166589-4), GM-32 (032519) (680-166589-5), GM-32D (032519) (680-166589-6), DUP04 (032519) (680-166589-7), EB-02 (032519) (680-166589-9), GM-2B (032619) (680-166589-10), GM-16M (032619) (680-166589-11), GM-16S (032619) (680-166589-12), GM-26M (032619) (680-166589-13), GM-26S (032619) (680-166589-14), GM-30M (032619) (680-166589-15), GM-31M (032619) (680-166589-16), GM-31S (032619) (680-166589-17) and DUP05 (032619) (680-166589-18) were analyzed for Semivolatile Organic Compounds by GCMS - Low Level in accordance with EPA SW-846 Method 8270D. The samples were prepared on 04/01/2019 and analyzed on 04/02/2019 and 04/03/2019.

The following sample was diluted 5X due to the abundance of non-target analytes: GM-21S (032519) (680-166589-2). Elevated reporting limits (RLs) are provided.

Two surrogates are used for this analysis. The laboratory's SOP allows one of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: GM-21S (032519) (680-166589-2). These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCHLORATE (IC)

Samples GM-21M (032519) (680-166589-1), GM-21S (032519) (680-166589-2), GM-22M (032519) (680-166589-3), GM-22S (032519) (680-166589-4), GM-32 (032519) (680-166589-5), GM-32D (032519) (680-166589-6), DUP04 (032519) (680-166589-7), EB-02 (032519) (680-166589-9), GM-2B (032619) (680-166589-10), GM-16M (032619) (680-166589-11), GM-16S (032619) (680-166589-12), GM-26M (032619) (680-166589-13), GM-26S (032619) (680-166589-14), GM-30M (032619) (680-166589-15), GM-31M (032619) (680-166589-16), GM-31S (032619) (680-166589-17) and DUP05 (032619) (680-166589-18) were analyzed for perchlorate (IC) in accordance with EPA Method 314.0. The samples were analyzed on 04/09/2019.

Samples GM-21M (032519) (680-166589-1)[20X], GM-21S (032519) (680-166589-2)[10X], GM-22M (032519) (680-166589-3)[10X], GM-22S (032519) (680-166589-4)[10X], DUP04 (032519) (680-166589-7)[20X], GM-16S (032619) (680-166589-12)[20X], GM-26M (032619) (680-166589-13)[10X] and GM-26S (032619) (680-166589-14)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP) - DISSOLVED

Samples GM-21M (032519) (680-166589-1), GM-22M (032519) (680-166589-3), DUP04 (032519) (680-166589-7), EB-02 (032519) (680-166589-9), GM-2B (032619) (680-166589-10) and GM-26M (032619) (680-166589-13) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/03/2019 and analyzed on 04/04/2019.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples GM-21M (032519) (680-166589-1), GM-22M (032519) (680-166589-3), DUP04 (032519) (680-166589-7), EB-02 (032519)

Job ID: 680-166589-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

(680-166589-9), GM-2B (032619) (680-166589-10) and GM-26M (032619) (680-166589-13) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 04/10/2019 and 04/11/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples GM-21M (032519) (680-166589-1), GM-22M (032519) (680-166589-3), DUP04 (032519) (680-166589-7), EB-02 (032519) (680-166589-9), GM-2B (032619) (680-166589-10) and GM-26M (032619) (680-166589-13) were analyzed for total organic carbon in accordance with SM 5310B. The samples were analyzed on 04/12/2019.

Total Organic Carbon was detected in method blank MB 680-566089/4 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-166589-1	GM-21M (032519)	Water	03/25/19 15:00	03/28/19 08:52
680-166589-2	GM-21S (032519)	Water	03/25/19 13:40	03/28/19 08:52
680-166589-3	GM-22M (032519)	Water	03/25/19 12:45	03/28/19 08:52
680-166589-4	GM-22S (032519)	Water	03/25/19 13:55	03/28/19 08:52
680-166589-5	GM-32 (032519)	Water	03/25/19 10:20	03/28/19 08:52
680-166589-6	GM-32D (032519)	Water	03/25/19 10:25	03/28/19 08:52
680-166589-7	DUP04 (032519)	Water	03/25/19 12:00	03/28/19 08:52
680-166589-8	TB-05	Water	03/25/19 00:00	03/28/19 08:52
680-166589-9	EB-02 (032519)	Water	03/25/19 00:00	03/28/19 08:52
680-166589-10	GM-2B (032619)	Water	03/26/19 14:35	03/28/19 08:52
680-166589-11	GM-16M (032619)	Water	03/26/19 09:10	03/28/19 08:52
680-166589-12	GM-16S (032619)	Water	03/26/19 09:00	03/28/19 08:52
680-166589-13	GM-26M (032619)	Water	03/26/19 12:40	03/28/19 08:52
680-166589-14	GM-26S (032619)	Water	03/26/19 13:50	03/28/19 08:52
680-166589-15	GM-30M (032619)	Water	03/26/19 11:10	03/28/19 08:52
680-166589-16	GM-31M (032619)	Water	03/26/19 12:20	03/28/19 08:52
680-166589-17	GM-31S (032619)	Water	03/26/19 11:05	03/28/19 08:52
680-166589-18	DUP05 (032619)	Water	03/26/19 08:00	03/28/19 08:52

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL EDI
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
314.0	Perchlorate (IC)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL SAV
5310 B-2011	Organic Carbon, Total (TOC)	SM	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL EDI
5030B	Purge and Trap	SW846	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Client: ARCADIS U.S., Inc.
Job ID: 680-166589-1
Project/Site: ATK Orbital Elkton

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-21M (032519) — Lab Sample ID: 680-166589-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	0.53	J	1.0	0.33	ug/L	1		8260B	Total/NA
Chloroform	0.58	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	4.1		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	0.81	J	1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.60	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	15		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	4.1		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	2.7		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	190		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	3.1		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	1.3		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	220		20	6.3	ug/L	20		314.0	Total/NA
Dissolved Iron	150		50	17	ug/L	1		6010C	Dissolved

Client Sample ID: GM-21S (032519) — Lab Sample ID: 680-166589-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	23		10	4.1	ug/L	10		8260B	Total/NA
1,1-Dichloroethane	9.3	J	10	3.8	ug/L	10		8260B	Total/NA
1,2-Dichloroethane	5.9	J	10	5.0	ug/L	10		8260B	Total/NA
1,1-Dichloroethene	210		10	3.6	ug/L	10		8260B	Total/NA
1,2-Dichloroethene, Total	23		20	3.7	ug/L	10		8260B	Total/NA
1,1,1-Trichloroethane	72		10	3.7	ug/L	10		8260B	Total/NA
Trichloroethene	1100		10	4.8	ug/L	10		8260B	Total/NA
1,4-Dioxane	20		2.0	0.87	ug/L	5		8270D SIM	Total/NA
Perchlorate	64		10	3.1	ug/L	10		314.0	Total/NA

Client Sample ID: GM-22M (032519) — Lab Sample ID: 680-166589-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	26		10	4.1	ug/L	10		8260B	Total/NA
1,1-Dichloroethane	14		10	3.8	ug/L	10		8260B	Total/NA
1,1-Dichloroethene	340		10	3.6	ug/L	10		8260B	Total/NA
1,2-Dichloroethene, Total	26		20	3.7	ug/L	10		8260B	Total/NA
1,1,1-Trichloroethane	150		10	3.7	ug/L	10		8260B	Total/NA
Trichloroethene	1500		10	4.8	ug/L	10		8260B	Total/NA
1,4-Dioxane	16		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	8.2		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	71		10	3.1	ug/L	10		314.0	Total/NA
Total Organic Carbon	0.63	J	1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: GM-22S (032519) — Lab Sample ID: 680-166589-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	20		10	4.1	ug/L	10		8260B	Total/NA
1,1-Dichloroethane	11		10	3.8	ug/L	10		8260B	Total/NA
1,1-Dichloroethene	270		10	3.6	ug/L	10		8260B	Total/NA
1,2-Dichloroethene, Total	20		20	3.7	ug/L	10		8260B	Total/NA
1,1,1-Trichloroethane	95		10	3.7	ug/L	10		8260B	Total/NA
Trichloroethene	1200		10	4.8	ug/L	10		8260B	Total/NA
1,4-Dioxane	13		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	61		10	3.1	ug/L	10		314.0	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-32 (032519) — Lab Sample ID: 680-166589-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.6		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	1.4		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	1.6	J	2.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	25		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	0.91		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	11		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: GM-32D (032519) — Lab Sample ID: 680-166589-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.68	J	1.0	0.43	ug/L	1		8260B	Total/NA
m-Xylene & p-Xylene	0.50	J	1.0	0.35	ug/L	1		8260B	Total/NA
n-Butylbenzene	0.55	J	1.0	0.47	ug/L	1		8260B	Total/NA
o-Xylene	0.36	J	1.0	0.23	ug/L	1		8260B	Total/NA
Xylenes, Total	0.86	J	1.0	0.23	ug/L	1		8260B	Total/NA
Naphthalene	0.31		0.20	0.12	ug/L	1		8270D SIM	Total/NA

Client Sample ID: DUP04 (032519) — Lab Sample ID: 680-166589-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	0.53	J	1.0	0.33	ug/L	1		8260B	Total/NA
Chloroform	0.65	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	4.0		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	0.92	J	1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.65	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	14		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	4.0		2.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	190		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	3.6		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	1.3		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	210		20	6.3	ug/L	20		314.0	Total/NA
Dissolved Iron	150		50	17	ug/L	1		6010C	Dissolved

Client Sample ID: TB-05 — Lab Sample ID: 680-166589-8

No Detections.

Client Sample ID: EB-02 (032519) — Lab Sample ID: 680-166589-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	14		10	7.0	ug/L	1		8260B	Total/NA
Trichloroethene	0.57	J	1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	0.27	J	0.40	0.17	ug/L	1		8270D SIM	Total/NA

Client Sample ID: GM-2B (032619) — Lab Sample ID: 680-166589-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	4.6		1.0	0.41	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	4.6		2.0	0.37	ug/L	1		8260B	Total/NA
1,4-Dioxane	1.4		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	3.4		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Dissolved Iron	26000		50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	8.8		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-16M (032619) — Lab Sample ID: 680-166589-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	2.1		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	0.18	J	0.40	0.17	ug/L	1		8270D SIM	Total/NA

Client Sample ID: GM-16S (032619) — Lab Sample ID: 680-166589-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	2.9	J	5.0	2.5	ug/L	5		8260B	Total/NA
cis-1,2-Dichloroethene	150		5.0	2.1	ug/L	5		8260B	Total/NA
1,1-Dichloroethane	11		5.0	1.9	ug/L	5		8260B	Total/NA
1,2-Dichloroethane	4.0	J	5.0	2.5	ug/L	5		8260B	Total/NA
1,1-Dichloroethene	100		5.0	1.8	ug/L	5		8260B	Total/NA
1,2-Dichloroethene, Total	150		10	1.9	ug/L	5		8260B	Total/NA
1,1,1-Trichloroethane	30		5.0	1.9	ug/L	5		8260B	Total/NA
Trichloroethene	740		5.0	2.4	ug/L	5		8260B	Total/NA
Vinyl chloride	12		5.0	2.5	ug/L	5		8260B	Total/NA
1,4-Dioxane	15		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	280		20	6.3	ug/L	20		314.0	Total/NA

Client Sample ID: GM-26M (032619) — Lab Sample ID: 680-166589-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	1.8		1.0	0.33	ug/L	1		8260B	Total/NA
Chloroform	0.80	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	4.9		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	0.67	J	1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.51	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	10		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	4.9		2.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	180		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	2.6		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	1.8		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	96		10	3.1	ug/L	10		314.0	Total/NA
Total Organic Carbon	0.62	J	1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: GM-26S (032619) — Lab Sample ID: 680-166589-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	1.6		1.0	0.33	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	5.1		1.0	0.41	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.51	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	8.6		1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	5.1		2.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	150		1.0	0.48	ug/L	1		8260B	Total/NA
1,4-Dioxane	2.1		0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	110		10	3.1	ug/L	10		314.0	Total/NA

Client Sample ID: GM-30M (032619) — Lab Sample ID: 680-166589-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.70	J	1.0	0.48	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-31M (032619) — Lab Sample ID: 680-166589-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	0.34	J	10	0.30	ug/L	1		8260B	Total/NA

Client Sample ID: GM-31S (032619) — Lab Sample ID: 680-166589-17

No Detections.

Client Sample ID: DUP05 (032619) — Lab Sample ID: 680-166589-18

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-21M (032519)
Date Collected: 03/25/19 15:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 18:13	1
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 18:13	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 18:13	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 18:13	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 18:13	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 18:13	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 18:13	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 18:13	1
Carbon tetrachloride	**0.53**	**J**	1.0	0.33	ug/L			04/05/19 18:13	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 18:13	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/05/19 18:13	1
Chloroform	**0.58**	**J**	1.0	0.50	ug/L			04/05/19 18:13	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/05/19 18:13	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 18:13	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 18:13	1
cis-1,2-Dichloroethene	**4.1**		1.0	0.41	ug/L			04/05/19 18:13	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 18:13	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 18:13	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 18:13	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 18:13	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 18:13	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 18:13	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 18:13	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 18:13	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 18:13	1
1,1-Dichloroethane	**0.81**	**J**	1.0	0.38	ug/L			04/05/19 18:13	1
1,2-Dichloroethane	**0.60**	**J**	1.0	0.50	ug/L			04/05/19 18:13	1
1,1-Dichloroethene	**15**		1.0	0.36	ug/L			04/05/19 18:13	1
1,2-Dichloroethene, Total	**4.1**		2.0	0.37	ug/L			04/05/19 18:13	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 18:13	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 18:13	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 18:13	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 18:13	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 18:13	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 18:13	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 18:13	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 18:13	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 18:13	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 18:13	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 18:13	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 18:13	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 18:13	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 18:13	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 18:13	1
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 18:13	1

Client Sample ID: GM-21M (032519)
Date Collected: 03/25/19 15:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 18:13	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 18:13	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 18:13	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/05/19 18:13	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 18:13	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 18:13	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 18:13	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 18:13	1
1,1,1-Trichloroethane	**2.7**		1.0	0.37	ug/L			04/05/19 18:13	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 18:13	1
Trichloroethene	**190**		1.0	0.48	ug/L			04/05/19 18:13	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 18:13	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 18:13	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 18:13	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 18:13	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 18:13	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 18:13	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 18:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*80 - 120*		*04/05/19 18:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/05/19 18:13*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/05/19 18:13*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/05/19 18:13*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.1**		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 04:00	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 04:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*92*		*38 - 125*	*04/01/19 09:52*	*04/02/19 04:00*	*1*
Terphenyl-d14	*97*		*70 - 130*	*04/01/19 09:52*	*04/02/19 04:00*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**1.3**		1.0	0.40	mg/L			04/10/19 23:58	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**220**		20	6.3	ug/L			04/09/19 19:06	20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**150**		50	17	ug/L		04/03/19 10:50	04/04/19 22:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/12/19 01:04	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-21S (032519)
Date Collected: 03/25/19 13:40
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	70	ug/L			04/05/19 18:39	10
Benzene	<10		10	4.3	ug/L			04/05/19 18:39	10
Bromobenzene	<10		10	5.0	ug/L			04/05/19 18:39	10
Bromochloromethane	<10		10	4.5	ug/L			04/05/19 18:39	10
Bromodichloromethane	<10		10	4.4	ug/L			04/05/19 18:39	10
Bromoform	<10		10	4.3	ug/L			04/05/19 18:39	10
Bromomethane	<50		50	25	ug/L			04/05/19 18:39	10
2-Butanone	<100		100	34	ug/L			04/05/19 18:39	10
Carbon disulfide	<20		20	10	ug/L			04/05/19 18:39	10
Carbon tetrachloride	<10		10	3.3	ug/L			04/05/19 18:39	10
Chlorobenzene	<10		10	2.6	ug/L			04/05/19 18:39	10
Chloroethane	<50		50	25	ug/L			04/05/19 18:39	10
2-Chloroethyl vinyl ether	<100		100	50	ug/L			04/05/19 18:39	10
Chloroform	<10		10	5.0	ug/L			04/05/19 18:39	10
Chloromethane	<10		10	4.0	ug/L			04/05/19 18:39	10
2-Chlorotoluene	<10		10	2.7	ug/L			04/05/19 18:39	10
4-Chlorotoluene	<10		10	4.5	ug/L			04/05/19 18:39	10
cis-1,2-Dichloroethene	**23**		10	4.1	ug/L			04/05/19 18:39	10
cis-1,3-Dichloropropene	<10		10	4.0	ug/L			04/05/19 18:39	10
Dibromochloromethane	<10		10	3.2	ug/L			04/05/19 18:39	10
1,2-Dibromo-3-Chloropropane	<50		50	11	ug/L			04/05/19 18:39	10
1,2-Dibromoethane	<10		10	4.4	ug/L			04/05/19 18:39	10
Dibromomethane	<10		10	3.5	ug/L			04/05/19 18:39	10
1,2-Dichlorobenzene	<10		10	3.7	ug/L			04/05/19 18:39	10
1,3-Dichlorobenzene	<10		10	4.3	ug/L			04/05/19 18:39	10
1,4-Dichlorobenzene	<10		10	4.6	ug/L			04/05/19 18:39	10
Dichlorodifluoromethane	<10		10	6.0	ug/L			04/05/19 18:39	10
1,1-Dichloroethane	**9.3**	**J**	10	3.8	ug/L			04/05/19 18:39	10
1,2-Dichloroethane	**5.9**	**J**	10	5.0	ug/L			04/05/19 18:39	10
1,1-Dichloroethene	**210**		10	3.6	ug/L			04/05/19 18:39	10
1,2-Dichloroethene, Total	**23**		20	3.7	ug/L			04/05/19 18:39	10
1,2-Dichloropropane	<10		10	6.7	ug/L			04/05/19 18:39	10
1,3-Dichloropropane	<10		10	3.4	ug/L			04/05/19 18:39	10
2,2-Dichloropropane	<10		10	3.7	ug/L			04/05/19 18:39	10
1,1-Dichloropropene	<10		10	3.4	ug/L			04/05/19 18:39	10
Ethylbenzene	<10		10	3.3	ug/L			04/05/19 18:39	10
Hexachlorobutadiene	<50		50	25	ug/L			04/05/19 18:39	10
2-Hexanone	<100		100	20	ug/L			04/05/19 18:39	10
Isopropylbenzene	<10		10	3.5	ug/L			04/05/19 18:39	10
Methylene Chloride	<50		50	25	ug/L			04/05/19 18:39	10
4-Methyl-2-pentanone	<100		100	21	ug/L			04/05/19 18:39	10
Methyl tert-butyl ether	<100		100	3.0	ug/L			04/05/19 18:39	10
m-Xylene & p-Xylene	<10		10	3.5	ug/L			04/05/19 18:39	10
n-Butylbenzene	<10		10	4.7	ug/L			04/05/19 18:39	10
N-Propylbenzene	<10		10	3.8	ug/L			04/05/19 18:39	10
o-Xylene	<10		10	2.3	ug/L			04/05/19 18:39	10
p-Isopropyltoluene	<10		10	4.8	ug/L			04/05/19 18:39	10
sec-Butylbenzene	<10		10	4.2	ug/L			04/05/19 18:39	10
Styrene	<10		10	2.7	ug/L			04/05/19 18:39	10

Client Sample ID: GM-21S (032519)
Date Collected: 03/25/19 13:40
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<10		10	4.5	ug/L			04/05/19 18:39	10
1,1,1,2-Tetrachloroethane	<10		10	3.7	ug/L			04/05/19 18:39	10
1,1,2,2-Tetrachloroethane	<10		10	6.2	ug/L			04/05/19 18:39	10
Tetrachloroethene	<10		10	7.4	ug/L			04/05/19 18:39	10
Toluene	<10		10	4.8	ug/L			04/05/19 18:39	10
trans-1,2-Dichloroethene	<10		10	3.7	ug/L			04/05/19 18:39	10
trans-1,3-Dichloropropene	<10		10	4.2	ug/L			04/05/19 18:39	10
1,2,3-Trichlorobenzene	<50		50	25	ug/L			04/05/19 18:39	10
1,2,4-Trichlorobenzene	<50		50	25	ug/L			04/05/19 18:39	10
1,1,1-Trichloroethane	**72**		10	3.7	ug/L			04/05/19 18:39	10
1,1,2-Trichloroethane	<10		10	3.3	ug/L			04/05/19 18:39	10
Trichloroethene	**1100**		10	4.8	ug/L			04/05/19 18:39	10
Trichlorofluoromethane	<10		10	4.2	ug/L			04/05/19 18:39	10
1,2,3-Trichloropropane	<10		10	3.9	ug/L			04/05/19 18:39	10
1,2,4-Trimethylbenzene	<10		10	4.7	ug/L			04/05/19 18:39	10
1,3,5-Trimethylbenzene	<10		10	3.1	ug/L			04/05/19 18:39	10
Vinyl acetate	<20		20	8.1	ug/L			04/05/19 18:39	10
Vinyl chloride	<10		10	5.0	ug/L			04/05/19 18:39	10
Xylenes, Total	<10		10	2.3	ug/L			04/05/19 18:39	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/05/19 18:39*	*10*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/05/19 18:39*	*10*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/05/19 18:39*	*10*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/05/19 18:39*	*10*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**20**		2.0	0.87	ug/L		04/01/19 09:52	04/02/19 18:43	5
Naphthalene	<1.0		1.0	0.62	ug/L		04/01/19 09:52	04/02/19 18:43	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*38 - 125*	*04/01/19 09:52*	*04/02/19 18:43*	*5*
Terphenyl-d14	*58*	*X*	*70 - 130*	*04/01/19 09:52*	*04/02/19 18:43*	*5*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**64**		10	3.1	ug/L			04/09/19 20:14	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-22M (032519)
Date Collected: 03/25/19 12:45
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	70	ug/L			04/05/19 19:05	10
Benzene	<10		10	4.3	ug/L			04/05/19 19:05	10
Bromobenzene	<10		10	5.0	ug/L			04/05/19 19:05	10
Bromochloromethane	<10		10	4.5	ug/L			04/05/19 19:05	10
Bromodichloromethane	<10		10	4.4	ug/L			04/05/19 19:05	10
Bromoform	<10		10	4.3	ug/L			04/05/19 19:05	10
Bromomethane	<50		50	25	ug/L			04/05/19 19:05	10
2-Butanone	<100		100	34	ug/L			04/05/19 19:05	10
Carbon disulfide	<20		20	10	ug/L			04/05/19 19:05	10
Carbon tetrachloride	<10		10	3.3	ug/L			04/05/19 19:05	10
Chlorobenzene	<10		10	2.6	ug/L			04/05/19 19:05	10
Chloroethane	<50		50	25	ug/L			04/05/19 19:05	10
2-Chloroethyl vinyl ether	<100		100	50	ug/L			04/05/19 19:05	10
Chloroform	<10		10	5.0	ug/L			04/05/19 19:05	10
Chloromethane	<10		10	4.0	ug/L			04/05/19 19:05	10
2-Chlorotoluene	<10		10	2.7	ug/L			04/05/19 19:05	10
4-Chlorotoluene	<10		10	4.5	ug/L			04/05/19 19:05	10
cis-1,2-Dichloroethene	**26**		10	4.1	ug/L			04/05/19 19:05	10
cis-1,3-Dichloropropene	<10		10	4.0	ug/L			04/05/19 19:05	10
Dibromochloromethane	<10		10	3.2	ug/L			04/05/19 19:05	10
1,2-Dibromo-3-Chloropropane	<50		50	11	ug/L			04/05/19 19:05	10
1,2-Dibromoethane	<10		10	4.4	ug/L			04/05/19 19:05	10
Dibromomethane	<10		10	3.5	ug/L			04/05/19 19:05	10
1,2-Dichlorobenzene	<10		10	3.7	ug/L			04/05/19 19:05	10
1,3-Dichlorobenzene	<10		10	4.3	ug/L			04/05/19 19:05	10
1,4-Dichlorobenzene	<10		10	4.6	ug/L			04/05/19 19:05	10
Dichlorodifluoromethane	<10		10	6.0	ug/L			04/05/19 19:05	10
1,1-Dichloroethane	**14**		10	3.8	ug/L			04/05/19 19:05	10
1,2-Dichloroethane	<10		10	5.0	ug/L			04/05/19 19:05	10
1,1-Dichloroethene	**340**		10	3.6	ug/L			04/05/19 19:05	10
1,2-Dichloroethene, Total	**26**		20	3.7	ug/L			04/05/19 19:05	10
1,2-Dichloropropane	<10		10	6.7	ug/L			04/05/19 19:05	10
1,3-Dichloropropane	<10		10	3.4	ug/L			04/05/19 19:05	10
2,2-Dichloropropane	<10		10	3.7	ug/L			04/05/19 19:05	10
1,1-Dichloropropene	<10		10	3.4	ug/L			04/05/19 19:05	10
Ethylbenzene	<10		10	3.3	ug/L			04/05/19 19:05	10
Hexachlorobutadiene	<50		50	25	ug/L			04/05/19 19:05	10
2-Hexanone	<100		100	20	ug/L			04/05/19 19:05	10
Isopropylbenzene	<10		10	3.5	ug/L			04/05/19 19:05	10
Methylene Chloride	<50		50	25	ug/L			04/05/19 19:05	10
4-Methyl-2-pentanone	<100		100	21	ug/L			04/05/19 19:05	10
Methyl tert-butyl ether	<100		100	3.0	ug/L			04/05/19 19:05	10
m-Xylene & p-Xylene	<10		10	3.5	ug/L			04/05/19 19:05	10
n-Butylbenzene	<10		10	4.7	ug/L			04/05/19 19:05	10
N-Propylbenzene	<10		10	3.8	ug/L			04/05/19 19:05	10
o-Xylene	<10		10	2.3	ug/L			04/05/19 19:05	10
p-Isopropyltoluene	<10		10	4.8	ug/L			04/05/19 19:05	10
sec-Butylbenzene	<10		10	4.2	ug/L			04/05/19 19:05	10
Styrene	<10		10	2.7	ug/L			04/05/19 19:05	10

Client Sample ID: GM-22M (032519)
Date Collected: 03/25/19 12:45
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<10		10	4.5	ug/L			04/05/19 19:05	10
1,1,1,2-Tetrachloroethane	<10		10	3.7	ug/L			04/05/19 19:05	10
1,1,2,2-Tetrachloroethane	<10		10	6.2	ug/L			04/05/19 19:05	10
Tetrachloroethene	<10		10	7.4	ug/L			04/05/19 19:05	10
Toluene	<10		10	4.8	ug/L			04/05/19 19:05	10
trans-1,2-Dichloroethene	<10		10	3.7	ug/L			04/05/19 19:05	10
trans-1,3-Dichloropropene	<10		10	4.2	ug/L			04/05/19 19:05	10
1,2,3-Trichlorobenzene	<50		50	25	ug/L			04/05/19 19:05	10
1,2,4-Trichlorobenzene	<50		50	25	ug/L			04/05/19 19:05	10
1,1,1-Trichloroethane	**150**		10	3.7	ug/L			04/05/19 19:05	10
1,1,2-Trichloroethane	<10		10	3.3	ug/L			04/05/19 19:05	10
Trichloroethene	**1500**		10	4.8	ug/L			04/05/19 19:05	10
Trichlorofluoromethane	<10		10	4.2	ug/L			04/05/19 19:05	10
1,2,3-Trichloropropane	<10		10	3.9	ug/L			04/05/19 19:05	10
1,2,4-Trimethylbenzene	<10		10	4.7	ug/L			04/05/19 19:05	10
1,3,5-Trimethylbenzene	<10		10	3.1	ug/L			04/05/19 19:05	10
Vinyl acetate	<20		20	8.1	ug/L			04/05/19 19:05	10
Vinyl chloride	<10		10	5.0	ug/L			04/05/19 19:05	10
Xylenes, Total	<10		10	2.3	ug/L			04/05/19 19:05	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/05/19 19:05*	*10*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/05/19 19:05*	*10*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/05/19 19:05*	*10*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/05/19 19:05*	*10*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**16**		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 04:43	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 04:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*99*		*38 - 125*	*04/01/19 09:52*	*04/02/19 04:43*	*1*
Terphenyl-d14	*102*		*70 - 130*	*04/01/19 09:52*	*04/02/19 04:43*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**8.2**		1.0	0.40	mg/L			04/11/19 00:11	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**71**		10	3.1	ug/L			04/09/19 20:37	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/03/19 10:50	04/04/19 22:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.63**	**J**	1.0	0.50	mg/L			04/12/19 19:12	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-22S (032519)
Date Collected: 03/25/19 13:55
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	70	ug/L			04/05/19 19:31	10
Benzene	<10		10	4.3	ug/L			04/05/19 19:31	10
Bromobenzene	<10		10	5.0	ug/L			04/05/19 19:31	10
Bromochloromethane	<10		10	4.5	ug/L			04/05/19 19:31	10
Bromodichloromethane	<10		10	4.4	ug/L			04/05/19 19:31	10
Bromoform	<10		10	4.3	ug/L			04/05/19 19:31	10
Bromomethane	<50		50	25	ug/L			04/05/19 19:31	10
2-Butanone	<100		100	34	ug/L			04/05/19 19:31	10
Carbon disulfide	<20		20	10	ug/L			04/05/19 19:31	10
Carbon tetrachloride	<10		10	3.3	ug/L			04/05/19 19:31	10
Chlorobenzene	<10		10	2.6	ug/L			04/05/19 19:31	10
Chloroethane	<50		50	25	ug/L			04/05/19 19:31	10
2-Chloroethyl vinyl ether	<100		100	50	ug/L			04/05/19 19:31	10
Chloroform	<10		10	5.0	ug/L			04/05/19 19:31	10
Chloromethane	<10		10	4.0	ug/L			04/05/19 19:31	10
2-Chlorotoluene	<10		10	2.7	ug/L			04/05/19 19:31	10
4-Chlorotoluene	<10		10	4.5	ug/L			04/05/19 19:31	10
cis-1,2-Dichloroethene	**20**		10	4.1	ug/L			04/05/19 19:31	10
cis-1,3-Dichloropropene	<10		10	4.0	ug/L			04/05/19 19:31	10
Dibromochloromethane	<10		10	3.2	ug/L			04/05/19 19:31	10
1,2-Dibromo-3-Chloropropane	<50		50	11	ug/L			04/05/19 19:31	10
1,2-Dibromoethane	<10		10	4.4	ug/L			04/05/19 19:31	10
Dibromomethane	<10		10	3.5	ug/L			04/05/19 19:31	10
1,2-Dichlorobenzene	<10		10	3.7	ug/L			04/05/19 19:31	10
1,3-Dichlorobenzene	<10		10	4.3	ug/L			04/05/19 19:31	10
1,4-Dichlorobenzene	<10		10	4.6	ug/L			04/05/19 19:31	10
Dichlorodifluoromethane	<10		10	6.0	ug/L			04/05/19 19:31	10
1,1-Dichloroethane	**11**		10	3.8	ug/L			04/05/19 19:31	10
1,2-Dichloroethane	<10		10	5.0	ug/L			04/05/19 19:31	10
1,1-Dichloroethene	**270**		10	3.6	ug/L			04/05/19 19:31	10
1,2-Dichloroethene, Total	**20**		20	3.7	ug/L			04/05/19 19:31	10
1,2-Dichloropropane	<10		10	6.7	ug/L			04/05/19 19:31	10
1,3-Dichloropropane	<10		10	3.4	ug/L			04/05/19 19:31	10
2,2-Dichloropropane	<10		10	3.7	ug/L			04/05/19 19:31	10
1,1-Dichloropropene	<10		10	3.4	ug/L			04/05/19 19:31	10
Ethylbenzene	<10		10	3.3	ug/L			04/05/19 19:31	10
Hexachlorobutadiene	<50		50	25	ug/L			04/05/19 19:31	10
2-Hexanone	<100		100	20	ug/L			04/05/19 19:31	10
Isopropylbenzene	<10		10	3.5	ug/L			04/05/19 19:31	10
Methylene Chloride	<50		50	25	ug/L			04/05/19 19:31	10
4-Methyl-2-pentanone	<100		100	21	ug/L			04/05/19 19:31	10
Methyl tert-butyl ether	<100		100	3.0	ug/L			04/05/19 19:31	10
m-Xylene & p-Xylene	<10		10	3.5	ug/L			04/05/19 19:31	10
n-Butylbenzene	<10		10	4.7	ug/L			04/05/19 19:31	10
N-Propylbenzene	<10		10	3.8	ug/L			04/05/19 19:31	10
o-Xylene	<10		10	2.3	ug/L			04/05/19 19:31	10
p-Isopropyltoluene	<10		10	4.8	ug/L			04/05/19 19:31	10
sec-Butylbenzene	<10		10	4.2	ug/L			04/05/19 19:31	10
Styrene	<10		10	2.7	ug/L			04/05/19 19:31	10

Client Sample ID: GM-22S (032519)
Date Collected: 03/25/19 13:55
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<10		10	4.5	ug/L			04/05/19 19:31	10
1,1,1,2-Tetrachloroethane	<10		10	3.7	ug/L			04/05/19 19:31	10
1,1,2,2-Tetrachloroethane	<10		10	6.2	ug/L			04/05/19 19:31	10
Tetrachloroethene	<10		10	7.4	ug/L			04/05/19 19:31	10
Toluene	<10		10	4.8	ug/L			04/05/19 19:31	10
trans-1,2-Dichloroethene	<10		10	3.7	ug/L			04/05/19 19:31	10
trans-1,3-Dichloropropene	<10		10	4.2	ug/L			04/05/19 19:31	10
1,2,3-Trichlorobenzene	<50		50	25	ug/L			04/05/19 19:31	10
1,2,4-Trichlorobenzene	<50		50	25	ug/L			04/05/19 19:31	10
1,1,1-Trichloroethane	**95**		10	3.7	ug/L			04/05/19 19:31	10
1,1,2-Trichloroethane	<10		10	3.3	ug/L			04/05/19 19:31	10
Trichloroethene	**1200**		10	4.8	ug/L			04/05/19 19:31	10
Trichlorofluoromethane	<10		10	4.2	ug/L			04/05/19 19:31	10
1,2,3-Trichloropropane	<10		10	3.9	ug/L			04/05/19 19:31	10
1,2,4-Trimethylbenzene	<10		10	4.7	ug/L			04/05/19 19:31	10
1,3,5-Trimethylbenzene	<10		10	3.1	ug/L			04/05/19 19:31	10
Vinyl acetate	<20		20	8.1	ug/L			04/05/19 19:31	10
Vinyl chloride	<10		10	5.0	ug/L			04/05/19 19:31	10
Xylenes, Total	<10		10	2.3	ug/L			04/05/19 19:31	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/05/19 19:31*	*10*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*		*04/05/19 19:31*	*10*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/05/19 19:31*	*10*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/05/19 19:31*	*10*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**13**		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 05:04	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 05:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*96*		*38 - 125*	*04/01/19 09:52*	*04/02/19 05:04*	*1*
Terphenyl-d14	*101*		*70 - 130*	*04/01/19 09:52*	*04/02/19 05:04*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**61**		10	3.1	ug/L			04/09/19 21:00	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-32 (032519)
Date Collected: 03/25/19 10:20
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 02:22	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 02:22	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 02:22	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 02:22	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 02:22	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 02:22	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 02:22	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 02:22	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 02:22	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 02:22	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 02:22	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 02:22	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 02:22	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 02:22	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 02:22	1
cis-1,2-Dichloroethene	**1.6**		1.0	0.41	ug/L			04/06/19 02:22	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 02:22	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 02:22	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 02:22	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 02:22	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 02:22	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 02:22	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 02:22	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 02:22	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 02:22	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 02:22	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 02:22	1
1,1-Dichloroethene	**1.4**		1.0	0.36	ug/L			04/06/19 02:22	1
1,2-Dichloroethene, Total	**1.6**	**J**	2.0	0.37	ug/L			04/06/19 02:22	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 02:22	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 02:22	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 02:22	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 02:22	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 02:22	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 02:22	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 02:22	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 02:22	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 02:22	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 02:22	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 02:22	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 02:22	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 02:22	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 02:22	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 02:22	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 02:22	1

Client Sample ID: GM-32 (032519)
Date Collected: 03/25/19 10:20
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 02:22	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 02:22	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 02:22	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 02:22	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 02:22	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 02:22	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 02:22	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 02:22	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 02:22	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 02:22	1
Trichloroethene	**25**		1.0	0.48	ug/L			04/06/19 02:22	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 02:22	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 02:22	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 02:22	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 02:22	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 02:22	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 02:22	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 02:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 02:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/06/19 02:22*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 02:22*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/06/19 02:22*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.91**		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 05:25	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 05:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*104*		*38 - 125*	*04/01/19 09:52*	*04/02/19 05:25*	*1*
Terphenyl-d14	*114*		*70 - 130*	*04/01/19 09:52*	*04/02/19 05:25*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**11**		1.0	0.31	ug/L			04/09/19 01:05	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-32D (032519)
Date Collected: 03/25/19 10:25
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 02:45	1
Benzene	**0.68**	**J**	1.0	0.43	ug/L			04/06/19 02:45	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 02:45	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 02:45	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 02:45	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 02:45	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 02:45	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 02:45	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 02:45	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 02:45	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 02:45	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 02:45	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 02:45	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 02:45	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 02:45	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 02:45	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 02:45	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 02:45	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 02:45	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 02:45	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 02:45	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 02:45	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 02:45	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 02:45	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 02:45	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 02:45	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 02:45	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 02:45	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 02:45	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 02:45	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 02:45	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 02:45	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 02:45	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 02:45	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 02:45	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 02:45	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 02:45	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 02:45	1
m-Xylene & p-Xylene	**0.50**	**J**	1.0	0.35	ug/L			04/06/19 02:45	1
n-Butylbenzene	**0.55**	**J**	1.0	0.47	ug/L			04/06/19 02:45	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 02:45	1
o-Xylene	**0.36**	**J**	1.0	0.23	ug/L			04/06/19 02:45	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 02:45	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 02:45	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 02:45	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-32D (032519)
Date Collected: 03/25/19 10:25
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 02:45	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 02:45	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 02:45	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 02:45	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 02:45	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 02:45	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 02:45	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 02:45	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 02:45	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 02:45	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/06/19 02:45	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 02:45	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 02:45	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 02:45	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 02:45	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 02:45	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 02:45	1
Xylenes, Total	**0.86**	**J**	1.0	0.23	ug/L			04/06/19 02:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 02:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/06/19 02:45*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 02:45*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/06/19 02:45*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 05:46	1
Naphthalene	**0.31**		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 05:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*38 - 125*	*04/01/19 09:52*	*04/02/19 05:46*	*1*
Terphenyl-d14	*102*		*70 - 130*	*04/01/19 09:52*	*04/02/19 05:46*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 01:28	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: DUP04 (032519)

Date Collected: 03/25/19 12:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-7

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 03:08	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 03:08	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 03:08	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 03:08	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 03:08	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 03:08	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 03:08	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 03:08	1
Carbon tetrachloride	**0.53**	**J**	1.0	0.33	ug/L			04/06/19 03:08	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 03:08	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 03:08	1
Chloroform	**0.65**	**J**	1.0	0.50	ug/L			04/06/19 03:08	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 03:08	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 03:08	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 03:08	1
cis-1,2-Dichloroethene	**4.0**		1.0	0.41	ug/L			04/06/19 03:08	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 03:08	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 03:08	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 03:08	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 03:08	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 03:08	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 03:08	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 03:08	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 03:08	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 03:08	1
1,1-Dichloroethane	**0.92**	**J**	1.0	0.38	ug/L			04/06/19 03:08	1
1,2-Dichloroethane	**0.65**	**J**	1.0	0.50	ug/L			04/06/19 03:08	1
1,1-Dichloroethene	**14**		1.0	0.36	ug/L			04/06/19 03:08	1
1,2-Dichloroethene, Total	**4.0**		2.0	0.37	ug/L			04/06/19 03:08	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 03:08	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 03:08	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 03:08	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 03:08	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 03:08	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 03:08	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 03:08	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 03:08	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 03:08	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 03:08	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:08	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 03:08	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 03:08	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 03:08	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 03:08	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 03:08	1

Client Sample ID: DUP04 (032519)
Date Collected: 03/25/19 12:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 03:08	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:08	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 03:08	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 03:08	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 03:08	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 03:08	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 03:08	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:08	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:08	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 03:08	1
Trichloroethene	**190**		1.0	0.48	ug/L			04/06/19 03:08	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 03:08	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 03:08	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:08	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 03:08	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 03:08	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 03:08	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/06/19 03:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/06/19 03:08*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 03:08*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*04/06/19 03:08*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.6**		0.40	0.17	ug/L		04/01/19 09:52	04/03/19 03:53	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/03/19 03:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*91*		*38 - 125*	*04/01/19 09:52*	*04/03/19 03:53*	*1*
Terphenyl-d14	*88*		*70 - 130*	*04/01/19 09:52*	*04/03/19 03:53*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**1.3**		1.0	0.40	mg/L			04/11/19 00:24	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**210**		20	6.3	ug/L			04/09/19 21:23	20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**150**		50	17	ug/L		04/03/19 10:50	04/04/19 23:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/12/19 02:11	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: TB-05
Date Collected: 03/25/19 00:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 11:22	1
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 11:22	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 11:22	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 11:22	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 11:22	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 11:22	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 11:22	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 11:22	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/05/19 11:22	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 11:22	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/05/19 11:22	1
Chloroform	<1.0		1.0	0.50	ug/L			04/05/19 11:22	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/05/19 11:22	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 11:22	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 11:22	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/05/19 11:22	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 11:22	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 11:22	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 11:22	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 11:22	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 11:22	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 11:22	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 11:22	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 11:22	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 11:22	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/05/19 11:22	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/05/19 11:22	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/05/19 11:22	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/05/19 11:22	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 11:22	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 11:22	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 11:22	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 11:22	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 11:22	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 11:22	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 11:22	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 11:22	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 11:22	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 11:22	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 11:22	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 11:22	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 11:22	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 11:22	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 11:22	1
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 11:22	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: TB-05
Date Collected: 03/25/19 00:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 11:22	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 11:22	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 11:22	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/05/19 11:22	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 11:22	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 11:22	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 11:22	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 11:22	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/05/19 11:22	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 11:22	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/05/19 11:22	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 11:22	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 11:22	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 11:22	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 11:22	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 11:22	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 11:22	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 11:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/05/19 11:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/05/19 11:22*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/05/19 11:22*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/05/19 11:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: EB-02 (032519)
Date Collected: 03/25/19 00:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14		10	7.0	ug/L			04/06/19 03:31	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 03:31	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 03:31	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 03:31	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 03:31	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 03:31	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 03:31	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 03:31	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 03:31	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 03:31	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 03:31	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 03:31	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 03:31	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 03:31	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 03:31	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 03:31	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 03:31	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 03:31	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 03:31	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 03:31	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 03:31	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 03:31	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 03:31	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 03:31	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 03:31	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 03:31	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 03:31	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 03:31	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 03:31	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 03:31	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 03:31	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 03:31	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 03:31	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 03:31	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 03:31	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 03:31	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 03:31	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 03:31	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 03:31	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:31	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 03:31	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 03:31	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 03:31	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 03:31	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 03:31	1

Client Sample ID: EB-02 (032519)
Date Collected: 03/25/19 00:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 03:31	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:31	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 03:31	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 03:31	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 03:31	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 03:31	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 03:31	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:31	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:31	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 03:31	1
Trichloroethene	**0.57**	**J**	1.0	0.48	ug/L			04/06/19 03:31	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 03:31	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 03:31	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:31	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 03:31	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 03:31	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 03:31	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 03:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*04/06/19 03:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/06/19 03:31*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 03:31*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/06/19 03:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	<1.0	H	1.0	0.48	ug/L			04/09/19 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 16:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*73 - 131*		*04/09/19 16:44*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*04/09/19 16:44*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 16:44*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.27**	**J**	0.40	0.17	ug/L		04/01/19 09:52	04/02/19 19:04	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 19:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*101*		*38 - 125*	*04/01/19 09:52*	*04/02/19 19:04*	*1*
Terphenyl-d14	*95*		*70 - 130*	*04/01/19 09:52*	*04/02/19 19:04*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/11/19 00:36	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: EB-02 (032519)
Date Collected: 03/25/19 00:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-9
Matrix: Water

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 02:14	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/03/19 10:50	04/04/19 22:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/12/19 02:59	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-2B (032619)
Date Collected: 03/26/19 14:35
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 03:55	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 03:55	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 03:55	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 03:55	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 03:55	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 03:55	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 03:55	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 03:55	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 03:55	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 03:55	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 03:55	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 03:55	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 03:55	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 03:55	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 03:55	1
cis-1,2-Dichloroethene	**4.6**		1.0	0.41	ug/L			04/06/19 03:55	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 03:55	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 03:55	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 03:55	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 03:55	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 03:55	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 03:55	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 03:55	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 03:55	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 03:55	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 03:55	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 03:55	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 03:55	1
1,2-Dichloroethene, Total	**4.6**		2.0	0.37	ug/L			04/06/19 03:55	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 03:55	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 03:55	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 03:55	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 03:55	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 03:55	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 03:55	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 03:55	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 03:55	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 03:55	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 03:55	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:55	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 03:55	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 03:55	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 03:55	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 03:55	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 03:55	1

Client Sample ID: GM-2B (032619)
Date Collected: 03/26/19 14:35
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 03:55	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:55	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 03:55	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 03:55	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 03:55	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 03:55	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 03:55	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 03:55	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 03:55	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 03:55	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/06/19 03:55	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 03:55	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 03:55	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 03:55	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 03:55	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 03:55	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 03:55	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 03:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 03:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*04/06/19 03:55*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 03:55*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*04/06/19 03:55*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.4**		0.40	0.17	ug/L		04/01/19 16:49	04/02/19 19:25	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/02/19 19:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*91*		*38 - 125*	*04/01/19 16:49*	*04/02/19 19:25*	*1*
Terphenyl-d14	*90*		*70 - 130*	*04/01/19 16:49*	*04/02/19 19:25*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**3.4**		1.0	0.40	mg/L			04/11/19 00:49	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 02:37	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**26000**		50	17	ug/L		04/03/19 10:50	04/04/19 22:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**8.8**		1.0	0.50	mg/L			04/12/19 19:27	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-16M (032619)
Date Collected: 03/26/19 09:10
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 04:18	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 04:18	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 04:18	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 04:18	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 04:18	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 04:18	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 04:18	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 04:18	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 04:18	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 04:18	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 04:18	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 04:18	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 04:18	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 04:18	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 04:18	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 04:18	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 04:18	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 04:18	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 04:18	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 04:18	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 04:18	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 04:18	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 04:18	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 04:18	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 04:18	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 04:18	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 04:18	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 04:18	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 04:18	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 04:18	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 04:18	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 04:18	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 04:18	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 04:18	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 04:18	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 04:18	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 04:18	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 04:18	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 04:18	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 04:18	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 04:18	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 04:18	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 04:18	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 04:18	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 04:18	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-16M (032619)
Date Collected: 03/26/19 09:10
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 04:18	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 04:18	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 04:18	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 04:18	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 04:18	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 04:18	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 04:18	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 04:18	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 04:18	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 04:18	1
Trichloroethene	**2.1**		1.0	0.48	ug/L			04/06/19 04:18	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 04:18	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 04:18	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 04:18	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 04:18	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 04:18	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 04:18	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 04:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 04:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*92*		*73 - 131*		*04/06/19 04:18*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*04/06/19 04:18*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*04/06/19 04:18*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.18**	**J**	0.40	0.17	ug/L		04/01/19 16:49	04/02/19 19:47	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/02/19 19:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*98*		*38 - 125*	*04/01/19 16:49*	*04/02/19 19:47*	*1*
Terphenyl-d14	*90*		*70 - 130*	*04/01/19 16:49*	*04/02/19 19:47*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 03:00	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-16S (032619)
Date Collected: 03/26/19 09:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<50		50	35	ug/L			04/06/19 04:41	5
Benzene	<5.0		5.0	2.2	ug/L			04/06/19 04:41	5
Bromobenzene	<5.0		5.0	2.5	ug/L			04/06/19 04:41	5
Bromochloromethane	<5.0		5.0	2.3	ug/L			04/06/19 04:41	5
Bromodichloromethane	<5.0		5.0	2.2	ug/L			04/06/19 04:41	5
Bromoform	<5.0		5.0	2.2	ug/L			04/06/19 04:41	5
Bromomethane	<25		25	13	ug/L			04/06/19 04:41	5
2-Butanone	<50		50	17	ug/L			04/06/19 04:41	5
Carbon disulfide	<10		10	5.0	ug/L			04/06/19 04:41	5
Carbon tetrachloride	<5.0		5.0	1.7	ug/L			04/06/19 04:41	5
Chlorobenzene	<5.0		5.0	1.3	ug/L			04/06/19 04:41	5
Chloroethane	<25		25	13	ug/L			04/06/19 04:41	5
2-Chloroethyl vinyl ether	<50		50	25	ug/L			04/06/19 04:41	5
Chloroform	**2.9**	**J**	5.0	2.5	ug/L			04/06/19 04:41	5
Chloromethane	<5.0		5.0	2.0	ug/L			04/06/19 04:41	5
2-Chlorotoluene	<5.0		5.0	1.4	ug/L			04/06/19 04:41	5
4-Chlorotoluene	<5.0		5.0	2.3	ug/L			04/06/19 04:41	5
cis-1,2-Dichloroethene	**150**		5.0	2.1	ug/L			04/06/19 04:41	5
cis-1,3-Dichloropropene	<5.0		5.0	2.0	ug/L			04/06/19 04:41	5
Dibromochloromethane	<5.0		5.0	1.6	ug/L			04/06/19 04:41	5
1,2-Dibromo-3-Chloropropane	<25		25	5.5	ug/L			04/06/19 04:41	5
1,2-Dibromoethane	<5.0		5.0	2.2	ug/L			04/06/19 04:41	5
Dibromomethane	<5.0		5.0	1.8	ug/L			04/06/19 04:41	5
1,2-Dichlorobenzene	<5.0		5.0	1.9	ug/L			04/06/19 04:41	5
1,3-Dichlorobenzene	<5.0		5.0	2.2	ug/L			04/06/19 04:41	5
1,4-Dichlorobenzene	<5.0		5.0	2.3	ug/L			04/06/19 04:41	5
Dichlorodifluoromethane	<5.0		5.0	3.0	ug/L			04/06/19 04:41	5
1,1-Dichloroethane	**11**		5.0	1.9	ug/L			04/06/19 04:41	5
1,2-Dichloroethane	**4.0**	**J**	5.0	2.5	ug/L			04/06/19 04:41	5
1,1-Dichloroethene	**100**		5.0	1.8	ug/L			04/06/19 04:41	5
1,2-Dichloroethene, Total	**150**		10	1.9	ug/L			04/06/19 04:41	5
1,2-Dichloropropane	<5.0		5.0	3.4	ug/L			04/06/19 04:41	5
1,3-Dichloropropane	<5.0		5.0	1.7	ug/L			04/06/19 04:41	5
2,2-Dichloropropane	<5.0		5.0	1.9	ug/L			04/06/19 04:41	5
1,1-Dichloropropene	<5.0		5.0	1.7	ug/L			04/06/19 04:41	5
Ethylbenzene	<5.0		5.0	1.7	ug/L			04/06/19 04:41	5
Hexachlorobutadiene	<25		25	13	ug/L			04/06/19 04:41	5
2-Hexanone	<50		50	10	ug/L			04/06/19 04:41	5
Isopropylbenzene	<5.0		5.0	1.8	ug/L			04/06/19 04:41	5
Methylene Chloride	<25		25	13	ug/L			04/06/19 04:41	5
4-Methyl-2-pentanone	<50		50	11	ug/L			04/06/19 04:41	5
Methyl tert-butyl ether	<50		50	1.5	ug/L			04/06/19 04:41	5
m-Xylene & p-Xylene	<5.0		5.0	1.8	ug/L			04/06/19 04:41	5
n-Butylbenzene	<5.0		5.0	2.4	ug/L			04/06/19 04:41	5
N-Propylbenzene	<5.0		5.0	1.9	ug/L			04/06/19 04:41	5
o-Xylene	<5.0		5.0	1.2	ug/L			04/06/19 04:41	5
p-Isopropyltoluene	<5.0		5.0	2.4	ug/L			04/06/19 04:41	5
sec-Butylbenzene	<5.0		5.0	2.1	ug/L			04/06/19 04:41	5
Styrene	<5.0		5.0	1.4	ug/L			04/06/19 04:41	5

Client Sample ID: GM-16S (032619)
Date Collected: 03/26/19 09:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<5.0		5.0	2.3	ug/L			04/06/19 04:41	5
1,1,1,2-Tetrachloroethane	<5.0		5.0	1.9	ug/L			04/06/19 04:41	5
1,1,2,2-Tetrachloroethane	<5.0		5.0	3.1	ug/L			04/06/19 04:41	5
Tetrachloroethene	<5.0		5.0	3.7	ug/L			04/06/19 04:41	5
Toluene	<5.0		5.0	2.4	ug/L			04/06/19 04:41	5
trans-1,2-Dichloroethene	<5.0		5.0	1.9	ug/L			04/06/19 04:41	5
trans-1,3-Dichloropropene	<5.0		5.0	2.1	ug/L			04/06/19 04:41	5
1,2,3-Trichlorobenzene	<25		25	13	ug/L			04/06/19 04:41	5
1,2,4-Trichlorobenzene	<25		25	13	ug/L			04/06/19 04:41	5
1,1,1-Trichloroethane	**30**		5.0	1.9	ug/L			04/06/19 04:41	5
1,1,2-Trichloroethane	<5.0		5.0	1.7	ug/L			04/06/19 04:41	5
Trichloroethene	**740**		5.0	2.4	ug/L			04/06/19 04:41	5
Trichlorofluoromethane	<5.0		5.0	2.1	ug/L			04/06/19 04:41	5
1,2,3-Trichloropropane	<5.0		5.0	2.0	ug/L			04/06/19 04:41	5
1,2,4-Trimethylbenzene	<5.0		5.0	2.4	ug/L			04/06/19 04:41	5
1,3,5-Trimethylbenzene	<5.0		5.0	1.6	ug/L			04/06/19 04:41	5
Vinyl acetate	<10		10	4.1	ug/L			04/06/19 04:41	5
Vinyl chloride	**12**		5.0	2.5	ug/L			04/06/19 04:41	5
Xylenes, Total	<5.0		5.0	1.2	ug/L			04/06/19 04:41	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/06/19 04:41*	*5*
1,2-Dichloroethane-d4 (Surr)	*107*		*73 - 131*		*04/06/19 04:41*	*5*
Dibromofluoromethane (Surr)	*110*		*80 - 122*		*04/06/19 04:41*	*5*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*04/06/19 04:41*	*5*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**15**		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 03:10	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 03:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*98*		*38 - 125*	*04/01/19 16:49*	*04/03/19 03:10*	*1*
Terphenyl-d14	*100*		*70 - 130*	*04/01/19 16:49*	*04/03/19 03:10*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**280**		20	6.3	ug/L			04/09/19 21:46	20

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-26M (032619)
Date Collected: 03/26/19 12:40
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 05:04	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 05:04	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 05:04	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 05:04	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 05:04	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 05:04	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 05:04	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 05:04	1
Carbon tetrachloride	**1.8**		1.0	0.33	ug/L			04/06/19 05:04	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 05:04	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 05:04	1
Chloroform	**0.80**	**J**	1.0	0.50	ug/L			04/06/19 05:04	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 05:04	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 05:04	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 05:04	1
cis-1,2-Dichloroethene	**4.9**		1.0	0.41	ug/L			04/06/19 05:04	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 05:04	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 05:04	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 05:04	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 05:04	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 05:04	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 05:04	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 05:04	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 05:04	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 05:04	1
1,1-Dichloroethane	**0.67**	**J**	1.0	0.38	ug/L			04/06/19 05:04	1
1,2-Dichloroethane	**0.51**	**J**	1.0	0.50	ug/L			04/06/19 05:04	1
1,1-Dichloroethene	**10**		1.0	0.36	ug/L			04/06/19 05:04	1
1,2-Dichloroethene, Total	**4.9**		2.0	0.37	ug/L			04/06/19 05:04	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 05:04	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 05:04	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 05:04	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 05:04	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 05:04	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 05:04	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 05:04	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 05:04	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 05:04	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 05:04	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:04	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 05:04	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 05:04	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 05:04	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 05:04	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 05:04	1

Client Sample ID: GM-26M (032619)
Date Collected: 03/26/19 12:40
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 05:04	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:04	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 05:04	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 05:04	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 05:04	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 05:04	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 05:04	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:04	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:04	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 05:04	1
Trichloroethene	**180**		1.0	0.48	ug/L			04/06/19 05:04	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 05:04	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 05:04	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:04	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 05:04	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 05:04	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 05:04	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 05:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 05:04*	*1*
1,2-Dichloroethane-d4 (Surr)	*92*		*73 - 131*		*04/06/19 05:04*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*04/06/19 05:04*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/06/19 05:04*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.6**		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 04:14	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 04:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*99*		*38 - 125*	*04/01/19 16:49*	*04/03/19 04:14*	*1*
Terphenyl-d14	*97*		*70 - 130*	*04/01/19 16:49*	*04/03/19 04:14*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**1.8**		1.0	0.40	mg/L			04/11/19 01:02	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**96**		10	3.1	ug/L			04/09/19 22:09	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/03/19 10:50	04/04/19 22:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.62**	**J**	1.0	0.50	mg/L			04/12/19 04:54	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-26S (032619)
Date Collected: 03/26/19 13:50
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-14
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 05:27	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 05:27	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 05:27	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 05:27	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 05:27	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 05:27	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 05:27	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 05:27	1
Carbon tetrachloride	**1.6**		1.0	0.33	ug/L			04/06/19 05:27	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 05:27	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 05:27	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 05:27	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 05:27	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 05:27	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 05:27	1
cis-1,2-Dichloroethene	**5.1**		1.0	0.41	ug/L			04/06/19 05:27	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 05:27	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 05:27	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 05:27	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 05:27	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 05:27	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 05:27	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 05:27	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 05:27	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 05:27	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 05:27	1
1,2-Dichloroethane	**0.51**	**J**	1.0	0.50	ug/L			04/06/19 05:27	1
1,1-Dichloroethene	**8.6**		1.0	0.36	ug/L			04/06/19 05:27	1
1,2-Dichloroethene, Total	**5.1**		2.0	0.37	ug/L			04/06/19 05:27	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 05:27	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 05:27	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 05:27	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 05:27	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 05:27	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 05:27	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 05:27	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 05:27	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 05:27	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 05:27	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:27	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 05:27	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 05:27	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 05:27	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 05:27	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 05:27	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-26S (032619)
Date Collected: 03/26/19 13:50
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-14
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 05:27	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:27	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 05:27	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 05:27	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 05:27	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 05:27	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 05:27	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:27	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:27	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 05:27	1
Trichloroethene	**150**		1.0	0.48	ug/L			04/06/19 05:27	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 05:27	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 05:27	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:27	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 05:27	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 05:27	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 05:27	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 05:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 05:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*04/06/19 05:27*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 05:27*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*04/06/19 05:27*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.1**		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 04:36	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 04:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*96*		*38 - 125*	*04/01/19 16:49*	*04/03/19 04:36*	*1*
Terphenyl-d14	*96*		*70 - 130*	*04/01/19 16:49*	*04/03/19 04:36*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**110**		10	3.1	ug/L			04/09/19 22:32	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-30M (032619)
Date Collected: 03/26/19 11:10
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-15
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 05:50	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 05:50	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 05:50	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 05:50	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 05:50	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 05:50	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 05:50	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 05:50	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 05:50	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 05:50	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 05:50	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 05:50	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 05:50	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 05:50	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 05:50	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 05:50	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 05:50	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 05:50	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 05:50	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 05:50	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 05:50	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 05:50	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 05:50	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 05:50	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 05:50	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 05:50	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 05:50	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 05:50	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 05:50	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 05:50	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 05:50	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 05:50	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 05:50	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 05:50	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 05:50	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 05:50	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 05:50	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 05:50	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 05:50	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:50	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 05:50	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 05:50	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 05:50	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 05:50	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 05:50	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-30M (032619)

Lab Sample ID: 680-166589-15

Date Collected: 03/26/19 11:10

Matrix: Water

Date Received: 03/28/19 08:52

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 05:50	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:50	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 05:50	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 05:50	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 05:50	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 05:50	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 05:50	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 05:50	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 05:50	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 05:50	1
Trichloroethene	**0.70**	**J**	1.0	0.48	ug/L			04/06/19 05:50	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 05:50	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 05:50	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 05:50	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 05:50	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 05:50	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 05:50	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 05:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 05:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/06/19 05:50*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 05:50*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/06/19 05:50*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 04:57	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 04:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*81*		*38 - 125*	*04/01/19 16:49*	*04/03/19 04:57*	*1*
Terphenyl-d14	*77*		*70 - 130*	*04/01/19 16:49*	*04/03/19 04:57*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 04:32	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-31M (032619)
Date Collected: 03/26/19 12:20
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-16
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 06:14	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 06:14	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 06:14	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 06:14	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 06:14	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 06:14	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 06:14	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 06:14	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 06:14	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 06:14	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 06:14	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 06:14	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 06:14	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 06:14	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 06:14	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 06:14	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 06:14	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 06:14	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 06:14	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 06:14	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 06:14	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 06:14	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 06:14	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 06:14	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 06:14	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 06:14	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 06:14	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 06:14	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 06:14	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 06:14	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 06:14	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 06:14	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 06:14	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 06:14	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 06:14	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 06:14	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 06:14	1
Methyl tert-butyl ether	**0.34**	**J**	10	0.30	ug/L			04/06/19 06:14	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 06:14	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 06:14	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 06:14	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 06:14	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 06:14	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 06:14	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 06:14	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-31M (032619)
Date Collected: 03/26/19 12:20
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-16
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 06:14	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 06:14	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 06:14	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 06:14	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 06:14	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 06:14	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 06:14	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 06:14	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 06:14	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 06:14	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/06/19 06:14	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 06:14	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 06:14	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 06:14	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 06:14	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 06:14	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 06:14	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 06:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/06/19 06:14*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/06/19 06:14*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 06:14*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*04/06/19 06:14*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 05:18	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 05:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*77*		*38 - 125*	*04/01/19 16:49*	*04/03/19 05:18*	*1*
Terphenyl-d14	*79*		*70 - 130*	*04/01/19 16:49*	*04/03/19 05:18*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 05:40	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-31S (032619)
Date Collected: 03/26/19 11:05
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-17
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 06:37	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 06:37	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 06:37	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 06:37	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 06:37	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 06:37	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 06:37	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 06:37	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 06:37	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 06:37	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 06:37	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 06:37	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 06:37	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 06:37	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 06:37	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 06:37	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 06:37	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 06:37	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 06:37	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 06:37	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 06:37	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 06:37	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 06:37	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 06:37	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 06:37	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 06:37	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 06:37	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 06:37	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 06:37	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 06:37	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 06:37	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 06:37	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 06:37	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 06:37	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 06:37	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 06:37	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 06:37	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 06:37	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 06:37	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 06:37	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 06:37	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 06:37	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 06:37	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 06:37	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 06:37	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-31S (032619)
Date Collected: 03/26/19 11:05
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-17
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 06:37	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 06:37	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 06:37	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 06:37	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 06:37	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 06:37	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 06:37	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 06:37	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 06:37	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 06:37	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/06/19 06:37	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 06:37	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 06:37	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 06:37	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 06:37	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 06:37	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 06:37	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 06:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 06:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/06/19 06:37*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/06/19 06:37*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/06/19 06:37*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 05:39	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 05:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*85*		*38 - 125*	*04/01/19 16:49*	*04/03/19 05:39*	*1*
Terphenyl-d14	*85*		*70 - 130*	*04/01/19 16:49*	*04/03/19 05:39*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 06:03	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: DUP05 (032619)
Date Collected: 03/26/19 08:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-18
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/06/19 07:00	1
Benzene	<1.0		1.0	0.43	ug/L			04/06/19 07:00	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/06/19 07:00	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/06/19 07:00	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/06/19 07:00	1
Bromoform	<1.0		1.0	0.43	ug/L			04/06/19 07:00	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
2-Butanone	<10		10	3.4	ug/L			04/06/19 07:00	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/06/19 07:00	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/06/19 07:00	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/06/19 07:00	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/06/19 07:00	1
Chloroform	<1.0		1.0	0.50	ug/L			04/06/19 07:00	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/06/19 07:00	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/06/19 07:00	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/06/19 07:00	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/06/19 07:00	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/06/19 07:00	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/06/19 07:00	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/06/19 07:00	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/06/19 07:00	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/06/19 07:00	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/06/19 07:00	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/06/19 07:00	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/06/19 07:00	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/06/19 07:00	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/06/19 07:00	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/06/19 07:00	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/06/19 07:00	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/06/19 07:00	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/06/19 07:00	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/06/19 07:00	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/06/19 07:00	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/06/19 07:00	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/06/19 07:00	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
2-Hexanone	<10		10	2.0	ug/L			04/06/19 07:00	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/06/19 07:00	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/06/19 07:00	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/06/19 07:00	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/06/19 07:00	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 07:00	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/06/19 07:00	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/06/19 07:00	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/06/19 07:00	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/06/19 07:00	1
Styrene	<1.0		1.0	0.27	ug/L			04/06/19 07:00	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: DUP05 (032619)
Date Collected: 03/26/19 08:00
Date Received: 03/28/19 08:52

Lab Sample ID: 680-166589-18
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/06/19 07:00	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/06/19 07:00	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/06/19 07:00	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/06/19 07:00	1
Toluene	<1.0		1.0	0.48	ug/L			04/06/19 07:00	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/06/19 07:00	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/06/19 07:00	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/06/19 07:00	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/06/19 07:00	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/06/19 07:00	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/06/19 07:00	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/06/19 07:00	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/06/19 07:00	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/06/19 07:00	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/06/19 07:00	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/06/19 07:00	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/06/19 07:00	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/06/19 07:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/06/19 07:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*04/06/19 07:00*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/06/19 07:00*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/06/19 07:00*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 16:49	04/03/19 06:01	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 16:49	04/03/19 06:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*92*		*38 - 125*	*04/01/19 16:49*	*04/03/19 06:01*	*1*
Terphenyl-d14	*88*		*70 - 130*	*04/01/19 16:49*	*04/03/19 06:01*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/09/19 06:26	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-166589-1	GM-21M (032519)	101	86	94	99
680-166589-2	GM-21S (032519)	99	96	101	96
680-166589-3	GM-22M (032519)	99	96	101	96
680-166589-4	GM-22S (032519)	99	97	100	97
680-166589-5	GM-32 (032519)	105	94	100	105
680-166589-6	GM-32D (032519)	105	94	100	105
680-166589-7	DUP04 (032519)	106	94	100	108
680-166589-8	TB-05	103	86	94	99
680-166589-9	EB-02 (032519)	108	94	100	106
680-166589-9 - RA	EB-02 (032519)	104	99	105	96
680-166589-10	GM-2B (032619)	105	95	100	108
680-166589-11	GM-16M (032619)	105	92	98	107
680-166589-12	GM-16S (032619)	99	107	110	107
680-166589-13	GM-26M (032619)	105	92	98	106
680-166589-14	GM-26S (032619)	105	95	100	107
680-166589-15	GM-30M (032619)	105	93	100	106
680-166589-16	GM-31M (032619)	106	96	100	107
680-166589-17	GM-31S (032619)	105	96	100	106
680-166589-18	DUP05 (032619)	105	95	99	105
LCS 680-565204/4	Lab Control Sample	100	88	96	97
LCS 680-565285/5	Lab Control Sample	104	92	99	102
LCS 680-565539/4	Lab Control Sample	99	84	95	89
LCSD 680-565204/5	Lab Control Sample Dup	100	84	93	95
LCSD 680-565285/6	Lab Control Sample Dup	103	97	99	105
LCSD 680-565539/5	Lab Control Sample Dup	100	81	93	92
MB 680-565204/8	Method Blank	104	85	93	99
MB 680-565285/10	Method Blank	104	93	97	105
MB 680-565539/8	Method Blank	102	83	93	98

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		NBZ	TPHL
Lab Sample ID	Client Sample ID	(38-125)	(70-130)
680-166589-1	GM-21M (032519)	92	97
680-166589-2	GM-21S (032519)	70	58 X
680-166589-3	GM-22M (032519)	99	102
680-166589-4	GM-22S (032519)	96	101
680-166589-5	GM-32 (032519)	104	114
680-166589-6	GM-32D (032519)	100	102
680-166589-7	DUP04 (032519)	91	88
680-166589-9	EB-02 (032519)	101	95
680-166589-10	GM-2B (032619)	91	90

Surrogate Summary

Client: ARCADIS U.S., Inc.
Job ID: 680-166589-1
Project/Site: ATK Orbital Elkton

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Matrix: Water
Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)											
		NBZ	TPHL										
Lab Sample ID	Client Sample ID	(38-125)	(70-130)										
680-166589-11	GM-16M (032619)	98	90										
680-166589-12	GM-16S (032619)	98	100										
680-166589-13	GM-26M (032619)	99	97										
680-166589-14	GM-26S (032619)	96	96										
680-166589-15	GM-30M (032619)	81	77										
680-166589-16	GM-31M (032619)	77	79										
680-166589-17	GM-31S (032619)	85	85										
680-166589-18	DUP05 (032619)	92	88										
LCS 460-599485/2-A	Lab Control Sample	103	101										
LCSD 460-599485/3-A	Lab Control Sample Dup	98	100										
MB 460-599485/1-A	Method Blank	99	98										

Surrogate Legend

NBZ = Nitrobenzene-d5

TPHL = Terphenyl-d14

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-565204/8
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 10:56	1
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 10:56	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 10:56	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 10:56	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 10:56	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 10:56	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 10:56	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 10:56	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/05/19 10:56	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 10:56	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/05/19 10:56	1
Chloroform	<1.0		1.0	0.50	ug/L			04/05/19 10:56	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/05/19 10:56	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 10:56	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 10:56	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/05/19 10:56	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 10:56	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 10:56	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 10:56	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 10:56	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 10:56	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 10:56	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 10:56	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 10:56	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 10:56	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/05/19 10:56	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/05/19 10:56	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/05/19 10:56	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/05/19 10:56	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 10:56	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 10:56	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 10:56	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 10:56	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 10:56	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 10:56	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 10:56	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 10:56	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 10:56	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 10:56	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 10:56	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 10:56	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 10:56	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 10:56	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 10:56	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565204/8
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 10:56	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 10:56	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 10:56	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 10:56	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/05/19 10:56	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 10:56	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 10:56	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 10:56	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 10:56	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/05/19 10:56	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 10:56	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/05/19 10:56	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 10:56	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 10:56	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 10:56	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 10:56	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 10:56	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 10:56	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 10:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/05/19 10:56*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/05/19 10:56*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/05/19 10:56*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/05/19 10:56*	*1*

Lab Sample ID: LCS 680-565204/4
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	256		ug/L		102	70 - 135
Benzene	50.0	49.8		ug/L		100	80 - 120
Bromobenzene	50.0	51.9		ug/L		104	80 - 121
Bromochloromethane	50.0	49.7		ug/L		99	80 - 120
Bromodichloromethane	50.0	48.9		ug/L		98	80 - 120
Bromoform	50.0	51.8		ug/L		104	74 - 126
Bromomethane	50.0	52.0		ug/L		104	62 - 130
2-Butanone	250	261		ug/L		104	80 - 131
Carbon disulfide	50.0	46.5		ug/L		93	80 - 120
Carbon tetrachloride	50.0	49.7		ug/L		99	76 - 123
Chlorobenzene	50.0	51.2		ug/L		102	80 - 120
Chloroethane	50.0	58.7		ug/L		117	66 - 135
2-Chloroethyl vinyl ether	50.0	49.0		ug/L		98	71 - 135
Chloroform	50.0	48.0		ug/L		96	80 - 120
Chloromethane	50.0	53.7		ug/L		107	69 - 131
2-Chlorotoluene	50.0	50.3		ug/L		101	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565204/4
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	50.3		ug/L		101	80 - 120
cis-1,2-Dichloroethene	50.0	50.0		ug/L		100	80 - 120
cis-1,3-Dichloropropene	50.0	51.5		ug/L		103	80 - 120
Dibromochloromethane	50.0	51.5		ug/L		103	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	50.9		ug/L		102	71 - 134
1,2-Dibromoethane	50.0	49.3		ug/L		99	80 - 120
Dibromomethane	50.0	49.5		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	49.6		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
Dichlorodifluoromethane	50.0	44.4		ug/L		89	47 - 155
1,1-Dichloroethane	50.0	49.7		ug/L		99	80 - 120
1,2-Dichloroethane	50.0	44.2		ug/L		88	80 - 120
1,1-Dichloroethene	50.0	52.5		ug/L		105	76 - 120
1,2-Dichloroethene, Total	100	98.8		ug/L		99	80 - 120
1,2-Dichloropropane	50.0	51.8		ug/L		104	80 - 120
1,3-Dichloropropane	50.0	50.1		ug/L		100	80 - 120
2,2-Dichloropropane	50.0	50.8		ug/L		102	76 - 126
1,1-Dichloropropene	50.0	49.4		ug/L		99	80 - 120
Ethylbenzene	50.0	51.2		ug/L		102	80 - 120
Hexachlorobutadiene	50.0	50.3		ug/L		101	60 - 140
2-Hexanone	250	246		ug/L		99	74 - 127
Isopropylbenzene	50.0	51.8		ug/L		104	80 - 120
Methylene Chloride	50.0	47.3		ug/L		95	80 - 120
4-Methyl-2-pentanone	250	245		ug/L		98	76 - 124
Methyl tert-butyl ether	50.0	47.1		ug/L		94	80 - 120
m-Xylene & p-Xylene	50.0	51.2		ug/L		102	80 - 120
n-Butylbenzene	50.0	50.7		ug/L		101	80 - 120
N-Propylbenzene	50.0	51.4		ug/L		103	80 - 120
o-Xylene	50.0	50.6		ug/L		101	80 - 120
p-Isopropyltoluene	50.0	51.2		ug/L		102	80 - 120
sec-Butylbenzene	50.0	51.4		ug/L		103	80 - 120
Styrene	50.0	51.3		ug/L		103	80 - 120
tert-Butylbenzene	50.0	51.6		ug/L		103	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.1		ug/L		102	80 - 121
1,1,2,2-Tetrachloroethane	50.0	50.1		ug/L		100	80 - 120
Tetrachloroethene	50.0	52.5		ug/L		105	80 - 121
Toluene	50.0	50.4		ug/L		101	80 - 113
trans-1,2-Dichloroethene	50.0	48.8		ug/L		98	80 - 120
trans-1,3-Dichloropropene	50.0	51.1		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	47.6		ug/L		95	61 - 141
1,2,4-Trichlorobenzene	50.0	48.4		ug/L		97	68 - 128
1,1,1-Trichloroethane	50.0	47.6		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	50.9		ug/L		102	80 - 120
Trichloroethene	50.0	50.9		ug/L		102	80 - 120
Trichlorofluoromethane	50.0	51.5		ug/L		103	60 - 141
1,2,3-Trichloropropane	50.0	50.0		ug/L		100	80 - 123
1,2,4-Trimethylbenzene	50.0	51.9		ug/L		104	80 - 120
1,3,5-Trimethylbenzene	50.0	51.7		ug/L		103	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565204/4
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl acetate	100	114		ug/L		114	67 - 135
Vinyl chloride	50.0	54.1		ug/L		108	71 - 128
Xylenes, Total	100	102		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*

Lab Sample ID: LCSD 680-565204/5
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	248		ug/L		99	70 - 135	3	30
Benzene	50.0	48.5		ug/L		97	80 - 120	3	20
Bromobenzene	50.0	51.1		ug/L		102	80 - 121	2	20
Bromochloromethane	50.0	47.8		ug/L		96	80 - 120	4	20
Bromodichloromethane	50.0	47.7		ug/L		95	80 - 120	3	20
Bromoform	50.0	51.3		ug/L		103	74 - 126	1	20
Bromomethane	50.0	61.4		ug/L		123	62 - 130	17	20
2-Butanone	250	248		ug/L		99	80 - 131	5	20
Carbon disulfide	50.0	46.6		ug/L		93	80 - 120	0	20
Carbon tetrachloride	50.0	49.6		ug/L		99	76 - 123	0	20
Chlorobenzene	50.0	50.8		ug/L		102	80 - 120	1	20
Chloroethane	50.0	57.4		ug/L		115	66 - 135	2	20
2-Chloroethyl vinyl ether	50.0	47.0		ug/L		94	71 - 135	4	50
Chloroform	50.0	46.8		ug/L		94	80 - 120	3	20
Chloromethane	50.0	53.6		ug/L		107	69 - 131	0	30
2-Chlorotoluene	50.0	50.4		ug/L		101	80 - 120	0	20
4-Chlorotoluene	50.0	50.5		ug/L		101	80 - 120	0	20
cis-1,2-Dichloroethene	50.0	48.4		ug/L		97	80 - 120	3	20
cis-1,3-Dichloropropene	50.0	49.8		ug/L		100	80 - 120	3	20
Dibromochloromethane	50.0	50.1		ug/L		100	80 - 121	3	20
1,2-Dibromo-3-Chloropropane	50.0	51.4		ug/L		103	71 - 134	1	20
1,2-Dibromoethane	50.0	47.5		ug/L		95	80 - 120	4	20
Dibromomethane	50.0	46.7		ug/L		93	80 - 120	6	20
1,2-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	1	20
1,3-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	1	20
1,4-Dichlorobenzene	50.0	48.3		ug/L		97	80 - 120	1	20
Dichlorodifluoromethane	50.0	44.4		ug/L		89	47 - 155	0	40
1,1-Dichloroethane	50.0	48.9		ug/L		98	80 - 120	1	20
1,2-Dichloroethane	50.0	42.2		ug/L		84	80 - 120	5	50
1,1-Dichloroethene	50.0	52.5		ug/L		105	76 - 120	0	20
1,2-Dichloroethene, Total	100	96.8		ug/L		97	80 - 120	2	20
1,2-Dichloropropane	50.0	49.7		ug/L		99	80 - 120	4	20
1,3-Dichloropropane	50.0	48.0		ug/L		96	80 - 120	4	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565204/5
Matrix: Water
Analysis Batch: 565204

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,2-Dichloropropane	50.0	51.3		ug/L		103	76 - 126	1	20
1,1-Dichloropropene	50.0	49.0		ug/L		98	80 - 120	1	20
Ethylbenzene	50.0	51.1		ug/L		102	80 - 120	0	20
Hexachlorobutadiene	50.0	52.3		ug/L		105	60 - 140	4	20
2-Hexanone	250	232		ug/L		93	74 - 127	6	20
Isopropylbenzene	50.0	52.5		ug/L		105	80 - 120	1	20
Methylene Chloride	50.0	46.0		ug/L		92	80 - 120	3	20
4-Methyl-2-pentanone	250	232		ug/L		93	76 - 124	6	20
Methyl tert-butyl ether	50.0	44.8		ug/L		90	80 - 120	5	20
m-Xylene & p-Xylene	50.0	51.5		ug/L		103	80 - 120	1	20
n-Butylbenzene	50.0	51.8		ug/L		104	80 - 120	2	20
N-Propylbenzene	50.0	52.1		ug/L		104	80 - 120	1	20
o-Xylene	50.0	50.7		ug/L		101	80 - 120	0	30
p-Isopropyltoluene	50.0	52.3		ug/L		105	80 - 120	2	20
sec-Butylbenzene	50.0	52.5		ug/L		105	80 - 120	2	20
Styrene	50.0	51.1		ug/L		102	80 - 120	0	20
tert-Butylbenzene	50.0	52.6		ug/L		105	80 - 121	2	20
1,1,1,2-Tetrachloroethane	50.0	51.2		ug/L		102	80 - 121	0	20
1,1,2,2-Tetrachloroethane	50.0	48.9		ug/L		98	80 - 120	2	20
Tetrachloroethene	50.0	52.5		ug/L		105	80 - 121	0	20
Toluene	50.0	50.0		ug/L		100	80 - 113	1	20
trans-1,2-Dichloroethene	50.0	48.3		ug/L		97	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	48.7		ug/L		97	80 - 120	5	30
1,2,3-Trichlorobenzene	50.0	48.7		ug/L		97	61 - 141	2	20
1,2,4-Trichlorobenzene	50.0	49.8		ug/L		100	68 - 128	3	20
1,1,1-Trichloroethane	50.0	47.6		ug/L		95	80 - 120	0	20
1,1,2-Trichloroethane	50.0	48.6		ug/L		97	80 - 120	4	20
Trichloroethene	50.0	49.9		ug/L		100	80 - 120	2	20
Trichlorofluoromethane	50.0	52.3		ug/L		105	60 - 141	2	20
1,2,3-Trichloropropane	50.0	49.2		ug/L		98	80 - 123	2	30
1,2,4-Trimethylbenzene	50.0	51.8		ug/L		104	80 - 120	0	20
1,3,5-Trimethylbenzene	50.0	51.9		ug/L		104	80 - 120	0	20
Vinyl acetate	100	107		ug/L		107	67 - 135	6	20
Vinyl chloride	50.0	53.9		ug/L		108	71 - 128	0	20
Xylenes, Total	100	102		ug/L		102	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*
Dibromofluoromethane (Surr)	*93*		*80 - 122*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*

Lab Sample ID: MB 680-565285/10
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 23:17	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565285/10
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 23:17	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 23:17	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 23:17	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 23:17	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 23:17	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 23:17	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 23:17	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/05/19 23:17	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 23:17	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/05/19 23:17	1
Chloroform	<1.0		1.0	0.50	ug/L			04/05/19 23:17	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/05/19 23:17	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 23:17	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 23:17	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/05/19 23:17	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 23:17	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 23:17	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 23:17	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 23:17	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 23:17	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 23:17	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 23:17	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 23:17	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 23:17	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/05/19 23:17	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/05/19 23:17	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/05/19 23:17	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/05/19 23:17	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 23:17	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 23:17	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 23:17	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 23:17	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 23:17	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 23:17	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 23:17	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 23:17	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 23:17	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 23:17	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 23:17	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 23:17	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 23:17	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 23:17	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 23:17	1
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 23:17	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 23:17	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565285/10
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 23:17	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 23:17	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/05/19 23:17	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 23:17	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 23:17	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 23:17	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 23:17	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/05/19 23:17	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 23:17	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/05/19 23:17	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 23:17	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 23:17	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 23:17	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 23:17	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 23:17	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 23:17	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 23:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/05/19 23:17*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/05/19 23:17*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 122*		*04/05/19 23:17*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/05/19 23:17*	*1*

Lab Sample ID: LCS 680-565285/5
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	262		ug/L		105	70 - 135
Benzene	50.0	49.2		ug/L		98	80 - 120
Bromobenzene	50.0	50.5		ug/L		101	80 - 121
Bromochloromethane	50.0	49.3		ug/L		99	80 - 120
Bromodichloromethane	50.0	46.9		ug/L		94	80 - 120
Bromoform	50.0	51.5		ug/L		103	74 - 126
Bromomethane	50.0	51.5		ug/L		103	62 - 130
2-Butanone	250	258		ug/L		103	80 - 131
Carbon disulfide	50.0	50.0		ug/L		100	80 - 120
Carbon tetrachloride	50.0	50.2		ug/L		100	76 - 123
Chlorobenzene	50.0	50.2		ug/L		100	80 - 120
Chloroethane	50.0	47.5		ug/L		95	66 - 135
2-Chloroethyl vinyl ether	50.0	36.6		ug/L		73	71 - 135
Chloroform	50.0	49.0		ug/L		98	80 - 120
Chloromethane	50.0	50.2		ug/L		100	69 - 131
2-Chlorotoluene	50.0	49.6		ug/L		99	80 - 120
4-Chlorotoluene	50.0	50.0		ug/L		100	80 - 120
cis-1,2-Dichloroethene	50.0	50.1		ug/L		100	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565285/5
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	50.0	48.9		ug/L		98	80 - 120
Dibromochloromethane	50.0	49.2		ug/L		98	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	52.5		ug/L		105	71 - 134
1,2-Dibromoethane	50.0	48.8		ug/L		98	80 - 120
Dibromomethane	50.0	46.6		ug/L		93	80 - 120
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120
1,4-Dichlorobenzene	50.0	48.3		ug/L		97	80 - 120
Dichlorodifluoromethane	50.0	43.1		ug/L		86	47 - 155
1,1-Dichloroethane	50.0	49.5		ug/L		99	80 - 120
1,2-Dichloroethane	50.0	47.3		ug/L		95	80 - 120
1,1-Dichloroethene	50.0	49.3		ug/L		99	76 - 120
1,2-Dichloroethene, Total	100	101		ug/L		101	80 - 120
1,2-Dichloropropane	50.0	48.5		ug/L		97	80 - 120
1,3-Dichloropropane	50.0	47.8		ug/L		96	80 - 120
2,2-Dichloropropane	50.0	51.0		ug/L		102	76 - 126
1,1-Dichloropropene	50.0	49.8		ug/L		100	80 - 120
Ethylbenzene	50.0	50.9		ug/L		102	80 - 120
Hexachlorobutadiene	50.0	50.5		ug/L		101	60 - 140
2-Hexanone	250	246		ug/L		99	74 - 127
Isopropylbenzene	50.0	51.8		ug/L		104	80 - 120
Methylene Chloride	50.0	45.6		ug/L		91	80 - 120
4-Methyl-2-pentanone	250	251		ug/L		100	76 - 124
Methyl tert-butyl ether	50.0	47.3		ug/L		95	80 - 120
m-Xylene & p-Xylene	50.0	51.4		ug/L		103	80 - 120
n-Butylbenzene	50.0	50.5		ug/L		101	80 - 120
N-Propylbenzene	50.0	50.8		ug/L		102	80 - 120
o-Xylene	50.0	50.8		ug/L		102	80 - 120
p-Isopropyltoluene	50.0	51.5		ug/L		103	80 - 120
sec-Butylbenzene	50.0	49.4		ug/L		99	80 - 120
Styrene	50.0	53.1		ug/L		106	80 - 120
tert-Butylbenzene	50.0	49.9		ug/L		100	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.1		ug/L		100	80 - 121
1,1,2,2-Tetrachloroethane	50.0	51.6		ug/L		103	80 - 120
Tetrachloroethene	50.0	46.9		ug/L		94	80 - 121
Toluene	50.0	49.7		ug/L		99	80 - 113
trans-1,2-Dichloroethene	50.0	50.8		ug/L		102	80 - 120
trans-1,3-Dichloropropene	50.0	48.6		ug/L		97	80 - 120
1,2,3-Trichlorobenzene	50.0	51.5		ug/L		103	61 - 141
1,2,4-Trichlorobenzene	50.0	51.4		ug/L		103	68 - 128
1,1,1-Trichloroethane	50.0	50.2		ug/L		100	80 - 120
1,1,2-Trichloroethane	50.0	47.5		ug/L		95	80 - 120
Trichloroethene	50.0	49.8		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	47.8		ug/L		96	60 - 141
1,2,3-Trichloropropane	50.0	49.8		ug/L		100	80 - 123
1,2,4-Trimethylbenzene	50.0	50.6		ug/L		101	80 - 120
1,3,5-Trimethylbenzene	50.0	50.6		ug/L		101	80 - 120
Vinyl acetate	100	104		ug/L		104	67 - 135
Vinyl chloride	50.0	49.3		ug/L		99	71 - 128

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565285/5
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Xylenes, Total			100	102		ug/L		102	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*92*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*

Lab Sample ID: LCSD 680-565285/6
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	281		ug/L		113	70 - 135	7	30
Benzene			50.0	49.8		ug/L		100	80 - 120	1	20
Bromobenzene			50.0	51.1		ug/L		102	80 - 121	1	20
Bromochloromethane			50.0	52.2		ug/L		104	80 - 120	6	20
Bromodichloromethane			50.0	48.4		ug/L		97	80 - 120	3	20
Bromoform			50.0	50.9		ug/L		102	74 - 126	1	20
Bromomethane			50.0	54.4		ug/L		109	62 - 130	6	20
2-Butanone			250	272		ug/L		109	80 - 131	5	20
Carbon disulfide			50.0	51.7		ug/L		103	80 - 120	3	20
Carbon tetrachloride			50.0	50.3		ug/L		101	76 - 123	0	20
Chlorobenzene			50.0	50.4		ug/L		101	80 - 120	0	20
Chloroethane			50.0	48.9		ug/L		98	66 - 135	3	20
2-Chloroethyl vinyl ether			50.0	39.2		ug/L		78	71 - 135	7	50
Chloroform			50.0	49.6		ug/L		99	80 - 120	1	20
Chloromethane			50.0	50.1		ug/L		100	69 - 131	0	30
2-Chlorotoluene			50.0	49.4		ug/L		99	80 - 120	0	20
4-Chlorotoluene			50.0	49.9		ug/L		100	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	50.5		ug/L		101	80 - 120	1	20
cis-1,3-Dichloropropene			50.0	50.4		ug/L		101	80 - 120	3	20
Dibromochloromethane			50.0	51.0		ug/L		102	80 - 121	3	20
1,2-Dibromo-3-Chloropropane			50.0	52.0		ug/L		104	71 - 134	1	20
1,2-Dibromoethane			50.0	50.7		ug/L		101	80 - 120	4	20
Dibromomethane			50.0	49.1		ug/L		98	80 - 120	5	20
1,2-Dichlorobenzene			50.0	50.7		ug/L		101	80 - 120	1	20
1,3-Dichlorobenzene			50.0	49.7		ug/L		99	80 - 120	1	20
1,4-Dichlorobenzene			50.0	48.8		ug/L		98	80 - 120	1	20
Dichlorodifluoromethane			50.0	44.2		ug/L		88	47 - 155	3	40
1,1-Dichloroethane			50.0	50.3		ug/L		101	80 - 120	2	20
1,2-Dichloroethane			50.0	47.9		ug/L		96	80 - 120	1	50
1,1-Dichloroethene			50.0	50.2		ug/L		100	76 - 120	2	20
1,2-Dichloroethene, Total			100	101		ug/L		101	80 - 120	0	20
1,2-Dichloropropane			50.0	49.1		ug/L		98	80 - 120	1	20
1,3-Dichloropropane			50.0	49.7		ug/L		99	80 - 120	4	20
2,2-Dichloropropane			50.0	50.8		ug/L		102	76 - 126	0	20
1,1-Dichloropropene			50.0	50.8		ug/L		102	80 - 120	2	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565285/6
Matrix: Water
Analysis Batch: 565285

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene	50.0	50.5		ug/L		101	80 - 120	1	20
Hexachlorobutadiene	50.0	49.0		ug/L		98	60 - 140	3	20
2-Hexanone	250	255		ug/L		102	74 - 127	4	20
Isopropylbenzene	50.0	51.4		ug/L		103	80 - 120	1	20
Methylene Chloride	50.0	47.2		ug/L		94	80 - 120	3	20
4-Methyl-2-pentanone	250	263		ug/L		105	76 - 124	4	20
Methyl tert-butyl ether	50.0	49.0		ug/L		98	80 - 120	4	20
m-Xylene & p-Xylene	50.0	50.7		ug/L		101	80 - 120	1	20
n-Butylbenzene	50.0	49.0		ug/L		98	80 - 120	3	20
N-Propylbenzene	50.0	49.8		ug/L		100	80 - 120	2	20
o-Xylene	50.0	51.5		ug/L		103	80 - 120	1	30
p-Isopropyltoluene	50.0	51.0		ug/L		102	80 - 120	1	20
sec-Butylbenzene	50.0	48.3		ug/L		97	80 - 120	2	20
Styrene	50.0	52.6		ug/L		105	80 - 120	1	20
tert-Butylbenzene	50.0	49.1		ug/L		98	80 - 121	2	20
1,1,1,2-Tetrachloroethane	50.0	51.0		ug/L		102	80 - 121	2	20
1,1,2,2-Tetrachloroethane	50.0	52.8		ug/L		106	80 - 120	2	20
Tetrachloroethene	50.0	46.2		ug/L		92	80 - 121	2	20
Toluene	50.0	50.2		ug/L		100	80 - 113	1	20
trans-1,2-Dichloroethene	50.0	50.4		ug/L		101	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	50.5		ug/L		101	80 - 120	4	30
1,2,3-Trichlorobenzene	50.0	51.3		ug/L		103	61 - 141	0	20
1,2,4-Trichlorobenzene	50.0	52.4		ug/L		105	68 - 128	2	20
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	80 - 120	2	20
1,1,2-Trichloroethane	50.0	50.5		ug/L		101	80 - 120	6	20
Trichloroethene	50.0	50.2		ug/L		100	80 - 120	1	20
Trichlorofluoromethane	50.0	47.8		ug/L		96	60 - 141	0	20
1,2,3-Trichloropropane	50.0	50.3		ug/L		101	80 - 123	1	30
1,2,4-Trimethylbenzene	50.0	50.1		ug/L		100	80 - 120	1	20
1,3,5-Trimethylbenzene	50.0	50.5		ug/L		101	80 - 120	0	20
Vinyl acetate	100	109		ug/L		109	67 - 135	4	20
Vinyl chloride	50.0	49.7		ug/L		99	71 - 128	1	20
Xylenes, Total	100	102		ug/L		102	80 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*
Dibromofluoromethane (Surr)	*99*		*80 - 122*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 11:35	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 11:35	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 11:35	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 11:35	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 11:35	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 11:35	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 11:35	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 11:35	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 11:35	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 11:35	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 11:35	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 11:35	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 11:35	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 11:35	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 11:35	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 11:35	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 11:35	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 11:35	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 11:35	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 11:35	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 11:35	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 11:35	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 11:35	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 11:35	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:35	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 11:35	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 11:35	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 11:35	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 11:35	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 11:35	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 11:35	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:35	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 11:35	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 11:35	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 11:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*04/09/19 11:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 11:35*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 11:35*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/09/19 11:35*	*1*

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	261		ug/L		104	70 - 135
Benzene	50.0	48.7		ug/L		97	80 - 120
Bromobenzene	50.0	51.0		ug/L		102	80 - 121
Bromochloromethane	50.0	48.0		ug/L		96	80 - 120
Bromodichloromethane	50.0	46.7		ug/L		93	80 - 120
Bromoform	50.0	51.3		ug/L		103	74 - 126
Bromomethane	50.0	67.1	*	ug/L		134	62 - 130
2-Butanone	250	257		ug/L		103	80 - 131
Carbon disulfide	50.0	47.1		ug/L		94	80 - 120
Carbon tetrachloride	50.0	49.0		ug/L		98	76 - 123
Chlorobenzene	50.0	50.1		ug/L		100	80 - 120
Chloroethane	50.0	60.0		ug/L		120	66 - 135
2-Chloroethyl vinyl ether	50.0	46.2		ug/L		92	71 - 135
Chloroform	50.0	46.4		ug/L		93	80 - 120
Chloromethane	50.0	56.1		ug/L		112	69 - 131
2-Chlorotoluene	50.0	49.1		ug/L		98	80 - 120
4-Chlorotoluene	50.0	49.4		ug/L		99	80 - 120
cis-1,2-Dichloroethene	50.0	48.2		ug/L		96	80 - 120
cis-1,3-Dichloropropene	50.0	49.5		ug/L		99	80 - 120
Dibromochloromethane	50.0	49.5		ug/L		99	80 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromo-3-Chloropropane	50.0	50.4		ug/L		101	71 - 134
1,2-Dibromoethane	50.0	47.6		ug/L		95	80 - 120
Dibromomethane	50.0	47.7		ug/L		95	80 - 120
1,2-Dichlorobenzene	50.0	47.4		ug/L		95	80 - 120
1,3-Dichlorobenzene	50.0	47.0		ug/L		94	80 - 120
1,4-Dichlorobenzene	50.0	46.7		ug/L		93	80 - 120
Dichlorodifluoromethane	50.0	49.6		ug/L		99	47 - 155
1,1-Dichloroethane	50.0	48.9		ug/L		98	80 - 120
1,2-Dichloroethane	50.0	41.9		ug/L		84	80 - 120
1,1-Dichloroethene	50.0	52.7		ug/L		105	76 - 120
1,2-Dichloroethene, Total	100	96.6		ug/L		97	80 - 120
1,2-Dichloropropane	50.0	50.1		ug/L		100	80 - 120
1,3-Dichloropropane	50.0	47.9		ug/L		96	80 - 120
2,2-Dichloropropane	50.0	50.1		ug/L		100	76 - 126
1,1-Dichloropropene	50.0	48.6		ug/L		97	80 - 120
Ethylbenzene	50.0	49.6		ug/L		99	80 - 120
Hexachlorobutadiene	50.0	48.3		ug/L		97	60 - 140
2-Hexanone	250	240		ug/L		96	74 - 127
Isopropylbenzene	50.0	50.3		ug/L		101	80 - 120
Methylene Chloride	50.0	46.7		ug/L		93	80 - 120
4-Methyl-2-pentanone	250	235		ug/L		94	76 - 124
Methyl tert-butyl ether	50.0	46.3		ug/L		93	80 - 120
m-Xylene & p-Xylene	50.0	49.6		ug/L		99	80 - 120
n-Butylbenzene	50.0	48.1		ug/L		96	80 - 120
N-Propylbenzene	50.0	50.1		ug/L		100	80 - 120
o-Xylene	50.0	49.5		ug/L		99	80 - 120
p-Isopropyltoluene	50.0	48.8		ug/L		98	80 - 120
sec-Butylbenzene	50.0	50.7		ug/L		101	80 - 120
Styrene	50.0	50.1		ug/L		100	80 - 120
tert-Butylbenzene	50.0	51.4		ug/L		103	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.4		ug/L		101	80 - 121
1,1,2,2-Tetrachloroethane	50.0	49.2		ug/L		98	80 - 120
Tetrachloroethene	50.0	51.9		ug/L		104	80 - 121
Toluene	50.0	49.2		ug/L		98	80 - 113
trans-1,2-Dichloroethene	50.0	48.4		ug/L		97	80 - 120
trans-1,3-Dichloropropene	50.0	48.1		ug/L		96	80 - 120
1,2,3-Trichlorobenzene	50.0	46.8		ug/L		94	61 - 141
1,2,4-Trichlorobenzene	50.0	47.4		ug/L		95	68 - 128
1,1,1-Trichloroethane	50.0	47.3		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	48.5		ug/L		97	80 - 120
Trichloroethene	50.0	49.9		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	58.5		ug/L		117	60 - 141
1,2,3-Trichloropropane	50.0	49.4		ug/L		99	80 - 123
1,2,4-Trimethylbenzene	50.0	50.4		ug/L		101	80 - 120
1,3,5-Trimethylbenzene	50.0	50.5		ug/L		101	80 - 120
Vinyl acetate	100	108		ug/L		108	67 - 135
Vinyl chloride	50.0	58.1		ug/L		116	71 - 128
Xylenes, Total	100	99.1		ug/L		99	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	*99*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*
Dibromofluoromethane (Surr)	*95*		*80 - 122*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*

Lab Sample ID: LCSD 680-565539/5
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	278		ug/L		111	70 - 135	6	30
Benzene	50.0	48.7		ug/L		97	80 - 120	0	20
Bromobenzene	50.0	50.8		ug/L		102	80 - 121	0	20
Bromochloromethane	50.0	46.6		ug/L		93	80 - 120	3	20
Bromodichloromethane	50.0	45.9		ug/L		92	80 - 120	2	20
Bromoform	50.0	51.0		ug/L		102	74 - 126	1	20
Bromomethane	50.0	68.0	*	ug/L		136	62 - 130	1	20
2-Butanone	250	251		ug/L		100	80 - 131	2	20
Carbon disulfide	50.0	53.1		ug/L		106	80 - 120	12	20
Carbon tetrachloride	50.0	49.7		ug/L		99	76 - 123	2	20
Chlorobenzene	50.0	50.4		ug/L		101	80 - 120	1	20
Chloroethane	50.0	60.1		ug/L		120	66 - 135	0	20
2-Chloroethyl vinyl ether	50.0	45.9		ug/L		92	71 - 135	1	50
Chloroform	50.0	46.1		ug/L		92	80 - 120	1	20
Chloromethane	50.0	55.9		ug/L		112	69 - 131	0	30
2-Chlorotoluene	50.0	49.7		ug/L		99	80 - 120	1	20
4-Chlorotoluene	50.0	49.3		ug/L		99	80 - 120	0	20
cis-1,2-Dichloroethene	50.0	48.1		ug/L		96	80 - 120	0	20
cis-1,3-Dichloropropene	50.0	48.5		ug/L		97	80 - 120	2	20
Dibromochloromethane	50.0	48.8		ug/L		98	80 - 121	1	20
1,2-Dibromo-3-Chloropropane	50.0	50.2		ug/L		100	71 - 134	0	20
1,2-Dibromoethane	50.0	45.9		ug/L		92	80 - 120	4	20
Dibromomethane	50.0	46.4		ug/L		93	80 - 120	3	20
1,2-Dichlorobenzene	50.0	48.1		ug/L		96	80 - 120	1	20
1,3-Dichlorobenzene	50.0	48.3		ug/L		97	80 - 120	3	20
1,4-Dichlorobenzene	50.0	47.0		ug/L		94	80 - 120	1	20
Dichlorodifluoromethane	50.0	51.1		ug/L		102	47 - 155	3	40
1,1-Dichloroethane	50.0	51.2		ug/L		102	80 - 120	5	20
1,2-Dichloroethane	50.0	41.7		ug/L		83	80 - 120	1	50
1,1-Dichloroethene	50.0	60.4	*	ug/L		121	76 - 120	14	20
1,2-Dichloroethene, Total	100	103		ug/L		103	80 - 120	7	20
1,2-Dichloropropane	50.0	49.7		ug/L		99	80 - 120	1	20
1,3-Dichloropropane	50.0	46.7		ug/L		93	80 - 120	2	20
2,2-Dichloropropane	50.0	50.1		ug/L		100	76 - 126	0	20
1,1-Dichloropropene	50.0	48.4		ug/L		97	80 - 120	0	20
Ethylbenzene	50.0	50.4		ug/L		101	80 - 120	2	20
Hexachlorobutadiene	50.0	49.4		ug/L		99	60 - 140	2	20
2-Hexanone	250	231		ug/L		92	74 - 127	4	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565539/5
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Isopropylbenzene	50.0	51.0		ug/L		102	80 - 120	1	20
Methylene Chloride	50.0	51.7		ug/L		103	80 - 120	10	20
4-Methyl-2-pentanone	250	227		ug/L		91	76 - 124	4	20
Methyl tert-butyl ether	50.0	51.2		ug/L		102	80 - 120	10	20
m-Xylene & p-Xylene	50.0	50.5		ug/L		101	80 - 120	2	20
n-Butylbenzene	50.0	49.1		ug/L		98	80 - 120	2	20
N-Propylbenzene	50.0	50.8		ug/L		102	80 - 120	1	20
o-Xylene	50.0	49.8		ug/L		100	80 - 120	1	30
p-Isopropyltoluene	50.0	50.3		ug/L		101	80 - 120	3	20
sec-Butylbenzene	50.0	51.6		ug/L		103	80 - 120	2	20
Styrene	50.0	50.0		ug/L		100	80 - 120	0	20
tert-Butylbenzene	50.0	51.4		ug/L		103	80 - 121	0	20
1,1,1,2-Tetrachloroethane	50.0	50.3		ug/L		101	80 - 121	0	20
1,1,2,2-Tetrachloroethane	50.0	48.8		ug/L		98	80 - 120	1	20
Tetrachloroethene	50.0	52.1		ug/L		104	80 - 121	0	20
Toluene	50.0	49.0		ug/L		98	80 - 113	0	20
trans-1,2-Dichloroethene	50.0	55.0		ug/L		110	80 - 120	13	20
trans-1,3-Dichloropropene	50.0	47.3		ug/L		95	80 - 120	2	30
1,2,3-Trichlorobenzene	50.0	46.8		ug/L		94	61 - 141	0	20
1,2,4-Trichlorobenzene	50.0	48.1		ug/L		96	68 - 128	1	20
1,1,1-Trichloroethane	50.0	47.1		ug/L		94	80 - 120	0	20
1,1,2-Trichloroethane	50.0	48.3		ug/L		97	80 - 120	0	20
Trichloroethene	50.0	49.7		ug/L		99	80 - 120	0	20
Trichlorofluoromethane	50.0	60.4		ug/L		121	60 - 141	3	20
1,2,3-Trichloropropane	50.0	49.3		ug/L		99	80 - 123	0	30
1,2,4-Trimethylbenzene	50.0	51.1		ug/L		102	80 - 120	1	20
1,3,5-Trimethylbenzene	50.0	51.3		ug/L		103	80 - 120	2	20
Vinyl acetate	100	111		ug/L		111	67 - 135	3	20
Vinyl chloride	50.0	58.9		ug/L		118	71 - 128	1	20
Xylenes, Total	100	100		ug/L		100	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*81*		*73 - 131*
Dibromofluoromethane (Surr)	*93*		*80 - 122*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 460-599485/1-A
Matrix: Water
Analysis Batch: 599562

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 599485

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/01/19 09:52	04/02/19 02:56	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/01/19 09:52	04/02/19 02:56	1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 460-599485/1-A
Matrix: Water
Analysis Batch: 599562

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 599485

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	99		38 - 125	04/01/19 09:52	04/02/19 02:56	1
Terphenyl-d14	98		70 - 130	04/01/19 09:52	04/02/19 02:56	1

Lab Sample ID: LCS 460-599485/2-A
Matrix: Water
Analysis Batch: 599562

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 599485

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			0.800	0.572		ug/L		71	10 - 137		
Naphthalene			0.800	0.767		ug/L		96	24 - 124		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5	103		38 - 125
Terphenyl-d14	101		70 - 130

Lab Sample ID: LCSD 460-599485/3-A
Matrix: Water
Analysis Batch: 599562

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 599485

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			0.800	0.649		ug/L		81	10 - 137	13	30
Naphthalene			0.800	0.729		ug/L		91	24 - 124	5	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Nitrobenzene-d5	98		38 - 125
Terphenyl-d14	100		70 - 130

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-565829/33
Matrix: Water
Analysis Batch: 565829

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/10/19 19:32	1

Lab Sample ID: LCS 680-565829/34
Matrix: Water
Analysis Batch: 565829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			10.0	9.93		mg/L		99	90 - 110		

Lab Sample ID: LCSD 680-565829/35
Matrix: Water
Analysis Batch: 565829

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate			10.0	9.96		mg/L		100	90 - 110	0	15

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 550-174397/4
Matrix: Water
Analysis Batch: 174397

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/08/19 19:22	1

Lab Sample ID: LCS 550-174397/6
Matrix: Water
Analysis Batch: 174397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	25.0	22.0		ug/L		88	85 - 115

Lab Sample ID: LCSD 550-174397/8
Matrix: Water
Analysis Batch: 174397

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	25.0	21.4		ug/L		86	85 - 115	3	15

Lab Sample ID: 680-166589-1 MS
Matrix: Water
Analysis Batch: 174397

Client Sample ID: GM-21M (032519)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	220		500	735		ug/L		103	80 - 120

Lab Sample ID: 680-166589-1 MSD
Matrix: Water
Analysis Batch: 174397

Client Sample ID: GM-21M (032519)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	220		500	721		ug/L		100	80 - 120	2	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-564893/1-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 564893

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/03/19 10:50	04/04/19 21:54	1

Lab Sample ID: LCS 680-564893/2-A
Matrix: Water
Analysis Batch: 565240

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 564893

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron	5000	5130		ug/L		103	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 680-166589-10 MS
Matrix: Water
Analysis Batch: 565240

Client Sample ID: GM-2B (032619)
Prep Type: Dissolved
Prep Batch: 564893

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Iron	26000		5000	30600	4	ug/L		86	75 - 125

Lab Sample ID: 680-166589-10 MSD
Matrix: Water
Analysis Batch: 565240

Client Sample ID: GM-2B (032619)
Prep Type: Dissolved
Prep Batch: 564893

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Iron	26000		5000	31800	4	ug/L		109	75 - 125	4	20

Method: 5310 B-2011 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-566089/4
Matrix: Water
Analysis Batch: 566089

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.891	J	1.0	0.50	mg/L			04/11/19 22:44	1

Lab Sample ID: LCS 680-566089/5
Matrix: Water
Analysis Batch: 566089

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.6		mg/L		98	80 - 120

Lab Sample ID: LCSD 680-566089/6
Matrix: Water
Analysis Batch: 566089

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	19.7		mg/L		98	80 - 120	0	25

Lab Sample ID: 680-166589-1 MS
Matrix: Water
Analysis Batch: 566089

Client Sample ID: GM-21M (032519)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	<1.0		20.0	20.1		mg/L		101	80 - 120

Lab Sample ID: 680-166589-1 MSD
Matrix: Water
Analysis Batch: 566089

Client Sample ID: GM-21M (032519)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	<1.0		20.0	20.2		mg/L		101	80 - 120	0	25

Method: 5310 B-2011 - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: MB 680-566090/2
Matrix: Water
Analysis Batch: 566090

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/12/19 03:47	1

Lab Sample ID: LCS 680-566090/3
Matrix: Water
Analysis Batch: 566090

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.4		mg/L		97	80 - 120

Lab Sample ID: LCSD 680-566090/4
Matrix: Water
Analysis Batch: 566090

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	19.4		mg/L		97	80 - 120	0	25

Lab Sample ID: MB 680-566244/2
Matrix: Water
Analysis Batch: 566244

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/12/19 14:58	1

Lab Sample ID: LCS 680-566244/3
Matrix: Water
Analysis Batch: 566244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.3		mg/L		97	80 - 120

Lab Sample ID: LCSD 680-566244/4
Matrix: Water
Analysis Batch: 566244

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	19.5		mg/L		98	80 - 120	1	25

GC/MS VOA

Analysis Batch: 565204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	8260B	
680-166589-2	GM-21S (032519)	Total/NA	Water	8260B	
680-166589-3	GM-22M (032519)	Total/NA	Water	8260B	
680-166589-4	GM-22S (032519)	Total/NA	Water	8260B	
680-166589-8	TB-05	Total/NA	Water	8260B	
MB 680-565204/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565204/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565204/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-5	GM-32 (032519)	Total/NA	Water	8260B	
680-166589-6	GM-32D (032519)	Total/NA	Water	8260B	
680-166589-7	DUP04 (032519)	Total/NA	Water	8260B	
680-166589-9	EB-02 (032519)	Total/NA	Water	8260B	
680-166589-10	GM-2B (032619)	Total/NA	Water	8260B	
680-166589-11	GM-16M (032619)	Total/NA	Water	8260B	
680-166589-12	GM-16S (032619)	Total/NA	Water	8260B	
680-166589-13	GM-26M (032619)	Total/NA	Water	8260B	
680-166589-14	GM-26S (032619)	Total/NA	Water	8260B	
680-166589-15	GM-30M (032619)	Total/NA	Water	8260B	
680-166589-16	GM-31M (032619)	Total/NA	Water	8260B	
680-166589-17	GM-31S (032619)	Total/NA	Water	8260B	
680-166589-18	DUP05 (032619)	Total/NA	Water	8260B	
MB 680-565285/10	Method Blank	Total/NA	Water	8260B	
LCS 680-565285/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565285/6	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-9 - RA	EB-02 (032519)	Total/NA	Water	8260B	
MB 680-565539/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565539/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565539/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 599485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	3510C	
680-166589-2	GM-21S (032519)	Total/NA	Water	3510C	
680-166589-3	GM-22M (032519)	Total/NA	Water	3510C	
680-166589-4	GM-22S (032519)	Total/NA	Water	3510C	
680-166589-5	GM-32 (032519)	Total/NA	Water	3510C	
680-166589-6	GM-32D (032519)	Total/NA	Water	3510C	
680-166589-7	DUP04 (032519)	Total/NA	Water	3510C	
680-166589-9	EB-02 (032519)	Total/NA	Water	3510C	
680-166589-10	GM-2B (032619)	Total/NA	Water	3510C	
680-166589-11	GM-16M (032619)	Total/NA	Water	3510C	
680-166589-12	GM-16S (032619)	Total/NA	Water	3510C	
680-166589-13	GM-26M (032619)	Total/NA	Water	3510C	

GC/MS Semi VOA (Continued)

Prep Batch: 599485 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-14	GM-26S (032619)	Total/NA	Water	3510C	
680-166589-15	GM-30M (032619)	Total/NA	Water	3510C	
680-166589-16	GM-31M (032619)	Total/NA	Water	3510C	
680-166589-17	GM-31S (032619)	Total/NA	Water	3510C	
680-166589-18	DUP05 (032619)	Total/NA	Water	3510C	
MB 460-599485/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-599485/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-599485/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 599562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	8270D SIM	599485
680-166589-3	GM-22M (032519)	Total/NA	Water	8270D SIM	599485
680-166589-4	GM-22S (032519)	Total/NA	Water	8270D SIM	599485
680-166589-5	GM-32 (032519)	Total/NA	Water	8270D SIM	599485
680-166589-6	GM-32D (032519)	Total/NA	Water	8270D SIM	599485
MB 460-599485/1-A	Method Blank	Total/NA	Water	8270D SIM	599485
LCS 460-599485/2-A	Lab Control Sample	Total/NA	Water	8270D SIM	599485
LCSD 460-599485/3-A	Lab Control Sample Dup	Total/NA	Water	8270D SIM	599485

Analysis Batch: 599716

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-2	GM-21S (032519)	Total/NA	Water	8270D SIM	599485
680-166589-9	EB-02 (032519)	Total/NA	Water	8270D SIM	599485
680-166589-10	GM-2B (032619)	Total/NA	Water	8270D SIM	599485
680-166589-11	GM-16M (032619)	Total/NA	Water	8270D SIM	599485

Analysis Batch: 599925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-7	DUP04 (032519)	Total/NA	Water	8270D SIM	599485
680-166589-12	GM-16S (032619)	Total/NA	Water	8270D SIM	599485
680-166589-13	GM-26M (032619)	Total/NA	Water	8270D SIM	599485
680-166589-14	GM-26S (032619)	Total/NA	Water	8270D SIM	599485
680-166589-15	GM-30M (032619)	Total/NA	Water	8270D SIM	599485
680-166589-16	GM-31M (032619)	Total/NA	Water	8270D SIM	599485
680-166589-17	GM-31S (032619)	Total/NA	Water	8270D SIM	599485
680-166589-18	DUP05 (032619)	Total/NA	Water	8270D SIM	599485

HPLC/IC

Analysis Batch: 174397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	314.0	
680-166589-2	GM-21S (032519)	Total/NA	Water	314.0	
680-166589-3	GM-22M (032519)	Total/NA	Water	314.0	
680-166589-4	GM-22S (032519)	Total/NA	Water	314.0	
680-166589-5	GM-32 (032519)	Total/NA	Water	314.0	
680-166589-6	GM-32D (032519)	Total/NA	Water	314.0	
680-166589-7	DUP04 (032519)	Total/NA	Water	314.0	
680-166589-9	EB-02 (032519)	Total/NA	Water	314.0	
680-166589-10	GM-2B (032619)	Total/NA	Water	314.0	

HPLC/IC (Continued)

Analysis Batch: 174397 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-11	GM-16M (032619)	Total/NA	Water	314.0	
680-166589-12	GM-16S (032619)	Total/NA	Water	314.0	
680-166589-13	GM-26M (032619)	Total/NA	Water	314.0	
680-166589-14	GM-26S (032619)	Total/NA	Water	314.0	
680-166589-15	GM-30M (032619)	Total/NA	Water	314.0	
680-166589-16	GM-31M (032619)	Total/NA	Water	314.0	
680-166589-17	GM-31S (032619)	Total/NA	Water	314.0	
680-166589-18	DUP05 (032619)	Total/NA	Water	314.0	
MB 550-174397/4	Method Blank	Total/NA	Water	314.0	
LCS 550-174397/6	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-174397/8	Lab Control Sample Dup	Total/NA	Water	314.0	
680-166589-1 MS	GM-21M (032519)	Total/NA	Water	314.0	
680-166589-1 MSD	GM-21M (032519)	Total/NA	Water	314.0	

Analysis Batch: 565829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	300.0-1993 R2.1	
680-166589-3	GM-22M (032519)	Total/NA	Water	300.0-1993 R2.1	
680-166589-7	DUP04 (032519)	Total/NA	Water	300.0-1993 R2.1	
680-166589-9	EB-02 (032519)	Total/NA	Water	300.0-1993 R2.1	
680-166589-10	GM-2B (032619)	Total/NA	Water	300.0-1993 R2.1	
680-166589-13	GM-26M (032619)	Total/NA	Water	300.0-1993 R2.1	
MB 680-565829/33	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-565829/34	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-565829/35	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Prep Batch: 564893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Dissolved	Water	3005A	
680-166589-3	GM-22M (032519)	Dissolved	Water	3005A	
680-166589-7	DUP04 (032519)	Dissolved	Water	3005A	
680-166589-9	EB-02 (032519)	Dissolved	Water	3005A	
680-166589-10	GM-2B (032619)	Dissolved	Water	3005A	
680-166589-13	GM-26M (032619)	Dissolved	Water	3005A	
MB 680-564893/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-564893/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-166589-10 MS	GM-2B (032619)	Dissolved	Water	3005A	
680-166589-10 MSD	GM-2B (032619)	Dissolved	Water	3005A	

Analysis Batch: 565240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Dissolved	Water	6010C	564893
680-166589-3	GM-22M (032519)	Dissolved	Water	6010C	564893
680-166589-7	DUP04 (032519)	Dissolved	Water	6010C	564893
680-166589-9	EB-02 (032519)	Dissolved	Water	6010C	564893
680-166589-10	GM-2B (032619)	Dissolved	Water	6010C	564893
680-166589-13	GM-26M (032619)	Dissolved	Water	6010C	564893
MB 680-564893/1-A	Method Blank	Total Recoverable	Water	6010C	564893
LCS 680-564893/2-A	Lab Control Sample	Total Recoverable	Water	6010C	564893

Metals (Continued)

Analysis Batch: 565240 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-10 MS	GM-2B (032619)	Dissolved	Water	6010C	564893
680-166589-10 MSD	GM-2B (032619)	Dissolved	Water	6010C	564893

General Chemistry

Analysis Batch: 566089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-1	GM-21M (032519)	Total/NA	Water	5310 B-2011	
680-166589-7	DUP04 (032519)	Total/NA	Water	5310 B-2011	
680-166589-9	EB-02 (032519)	Total/NA	Water	5310 B-2011	
MB 680-566089/4	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-566089/5	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-566089/6	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	
680-166589-1 MS	GM-21M (032519)	Total/NA	Water	5310 B-2011	
680-166589-1 MSD	GM-21M (032519)	Total/NA	Water	5310 B-2011	

Analysis Batch: 566090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-13	GM-26M (032619)	Total/NA	Water	5310 B-2011	
MB 680-566090/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-566090/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-566090/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Analysis Batch: 566244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166589-3	GM-22M (032519)	Total/NA	Water	5310 B-2011	
680-166589-10	GM-2B (032619)	Total/NA	Water	5310 B-2011	
MB 680-566244/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-566244/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-566244/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-21M (032519)

Lab Sample ID: 680-166589-1

Date Collected: 03/25/19 15:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565204	04/05/19 18:13	Y1S	TAL SAV
	Instrument ID: CMSP2									
Prep Type	**Batch Type**	**Batch Method**	**Run**	**Dil Factor**	**Initial Amount**	**Final Amount**	**Batch Number**	**Prepared or Analyzed**	**Analyst**	**Lab**
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599562	04/02/19 04:00	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/10/19 23:58	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		20			174397	04/09/19 19:06	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 22:57	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566089	04/12/19 01:04	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-21S (032519)

Lab Sample ID: 680-166589-2

Date Collected: 03/25/19 13:40
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	5 mL	5 mL	565204	04/05/19 18:39	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		5			599716	04/02/19 18:43	CAZ	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		10			174397	04/09/19 20:14	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-22M (032519)

Lab Sample ID: 680-166589-3

Date Collected: 03/25/19 12:45
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	5 mL	5 mL	565204	04/05/19 19:05	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599562	04/02/19 04:43	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/11/19 00:11	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		10			174397	04/09/19 20:37	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-22M (032519)

Lab Sample ID: 680-166589-3

Date Collected: 03/25/19 12:45
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 22:51	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566244	04/12/19 19:12	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-22S (032519)

Lab Sample ID: 680-166589-4

Date Collected: 03/25/19 13:55
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	5 mL	5 mL	565204	04/05/19 19:31	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599562	04/02/19 05:04	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		10			174397	04/09/19 21:00	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-32 (032519)

Lab Sample ID: 680-166589-5

Date Collected: 03/25/19 10:20
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 02:22	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599562	04/02/19 05:25	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 01:05	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-32D (032519)

Lab Sample ID: 680-166589-6

Date Collected: 03/25/19 10:25
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 02:45	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599562	04/02/19 05:46	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 01:28	NEL	TAL PHX
	Instrument ID: IC4									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: DUP04 (032519)

Lab Sample ID: 680-166589-7

Date Collected: 03/25/19 12:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 03:08	Y1S	TAL SAV
	Instrument ID: CMSB									
Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 03:53	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/11/19 00:24	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		20			174397	04/09/19 21:23	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 23:02	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566089	04/12/19 02:11	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: TB-05

Lab Sample ID: 680-166589-8

Date Collected: 03/25/19 00:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565204	04/05/19 11:22	Y1S	TAL SAV
	Instrument ID: CMSP2									

Client Sample ID: EB-02 (032519)

Lab Sample ID: 680-166589-9

Date Collected: 03/25/19 00:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 03:31	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Analysis	8260B	RA	1	5 mL	5 mL	565539	04/09/19 16:44	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 09:52	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599716	04/02/19 19:04	CAZ	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/11/19 00:36	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			174397	04/09/19 02:14	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 22:41	BCB	TAL SAV
	Instrument ID: ICPE									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: EB-02 (032519)

Lab Sample ID: 680-166589-9

Date Collected: 03/25/19 00:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566089	04/12/19 02:59	KDM	TAL SAV

Client Sample ID: GM-2B (032619)

Lab Sample ID: 680-166589-10

Date Collected: 03/26/19 14:35
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 03:55	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599716	04/02/19 19:25	CAZ	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/11/19 00:49	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			174397	04/09/19 02:37	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 22:15	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566244	04/12/19 19:27	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-16M (032619)

Lab Sample ID: 680-166589-11

Date Collected: 03/26/19 09:10
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 04:18	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599716	04/02/19 19:47	CAZ	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 03:00	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-16S (032619)

Lab Sample ID: 680-166589-12

Date Collected: 03/26/19 09:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	5 mL	5 mL	565285	04/06/19 04:41	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 03:10	MME	TAL EDI
	Instrument ID: CBNAMS9									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-16S (032619)

Lab Sample ID: 680-166589-12

Date Collected: 03/26/19 09:00
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	314.0		20			174397	04/09/19 21:46	NEL	TAL PHX

Client Sample ID: GM-26M (032619)

Lab Sample ID: 680-166589-13

Date Collected: 03/26/19 12:40
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 05:04	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 04:14	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	565829	04/11/19 01:02	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		10			174397	04/09/19 22:09	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	564893	04/03/19 10:50	AJR	TAL SAV
Dissolved	Analysis	6010C		1			565240	04/04/19 22:46	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566090	04/12/19 04:54	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: GM-26S (032619)

Lab Sample ID: 680-166589-14

Date Collected: 03/26/19 13:50
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 05:27	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 04:36	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		10			174397	04/09/19 22:32	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-30M (032619)

Lab Sample ID: 680-166589-15

Date Collected: 03/26/19 11:10
Matrix: Water
Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 05:50	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 04:57	MME	TAL EDI
	Instrument ID: CBNAMS9									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Client Sample ID: GM-30M (032619)

Lab Sample ID: 680-166589-15

Date Collected: 03/26/19 11:10

Matrix: Water

Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	314.0		1			174397	04/09/19 04:32	NEL	TAL PHX

Client Sample ID: GM-31M (032619)

Lab Sample ID: 680-166589-16

Date Collected: 03/26/19 12:20

Matrix: Water

Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 06:14	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 05:18	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 05:40	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: GM-31S (032619)

Lab Sample ID: 680-166589-17

Date Collected: 03/26/19 11:05

Matrix: Water

Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 06:37	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 05:39	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 06:03	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: DUP05 (032619)

Lab Sample ID: 680-166589-18

Date Collected: 03/26/19 08:00

Matrix: Water

Date Received: 03/28/19 08:52

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565285	04/06/19 07:00	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3510C			250 mL	2 mL	599485	04/01/19 16:49	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			599925	04/03/19 06:01	MME	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174397	04/09/19 06:26	NEL	TAL PHX
	Instrument ID: IC4									

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Chain of Custody Record 309994

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Baltimore #201

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact:	Project Manager: Tina Armstrong	Site Contact: Rich Zambito	Date: 3/25/19
Company Name: Arcadis Inc	Tel/Fax: 410 987 0032	Lab Contact:	Carrier:
Address: 7550 Teague Road Suite 210			
City/State/Zip: Hanover, MD 21076			
Phone:			
Fax:			
Project Name: ATK Orbital			
Site: Elkton, MD			
P O # MD001006.0006			

COC No: 1 of 2 COCs
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below _____
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B-VOCs	8270D-SIM	314.0-Perchlorate	6010C-Dissolved Iron	SM5310-TOC B-TOC	300-ORG-M-28D	Sample Specific Notes:
GM-21M(032519)	3/25/19	1500	G	GW	11			3	2	1	1	3	1	
GM-21S(032519)		1340	G	GW	6			3	2	1				
GM-22M(032519)		1245	G	GW	11			3	2	1	1	3	1	
GM-22S(032519)		1355	G	GW	6			3	2	1				
GM-32(032519)		1020	G	GW	6			3	2	1				
GM-32D(032519)		1025	G	GW	6			3	2	1				
DUP04(032519)		1200	G	GW	11			3	2	1	1	3	1	
TB-05														
EB-02(032519)	3/25				17			6	4	2	1	3	1	

680-166589 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 3 coolers 04/0.5 4.3/4.4

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis		[signature]	TA	3/27/19 1120
[signature]		3/27/19	[signature]		
			Received in Laboratory by: [signature]		3.28.19 0852

Chain of Custody Record

398998

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Baltimore #201

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact:	Date: 3/26/2019	COC No:
Company Name: Arcadis Inc.	Tel/Fax:	Lab Contact:	Carrier:	1 of 1 COCs
Address: 7550 Teague	Analysis Turnaround Time			Sampler:
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital	☐ 1 week			
Site: Elkton, MD	☐ 2 days			Job / SDG No.:
PO# MD001006.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B-VOCs	6010C-Dissolved Mn	8270D-SIM	300.0/2GFM 2SD	SM5310 TOCs	314.0-Perchlorate	Sample Specific Notes:
GM-2B(032619)	3/26/19	1435	G	GW	11			3	1	2	1	3	1	
GM-16M(032619)		0910	G	GW	6			3		2			1	
GM-16S(032619)		0900	G	GW	6			3		2			1	
GM-26M(032619)		1240	G	GW	11			3	1	2	1	3	1	
GM-26S(032619)		1350	G	GW	6			3		2			1	
GM-30M(032619)		1110	G	GW	6			3		2			1	
GM-31M(032619)		1220	G	GW	6			3		2			1	
GM-31S(032619)		1105	G	GW	6			3		2			1	
DUP05(032619)		0800	G	GW	6			3		2			1	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 3 coolers 0.4/0.5 4.3/4.4

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis		Received by:	TA	3/27/19 1120
Relinquished by:		3/27/19 17:30	Received by:		
Relinquished by:			Received in Laboratory by:		328.19 0852

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4/18/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559806.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166589-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/9/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
GM-21M (032519) (680-166589-1)	3/25/19	15:00 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-21S (032519) (680-166589-2)	3/25/19	13:40 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-22M (032519) (680-166589-3)	3/25/19	12:45 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-22S (032519) (680-166589-4)	3/25/19	13:55 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-32 (032519) (680-166589-5)	3/25/19	10:20 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-32D (032519) (680-166589-6)	3/25/19	10:25 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
DUP04 (032519) (680-166589-7)	3/25/19	12:00 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
EB-02 (032519) (680-166589-9)	3/25/19	Eastern		Water		X	4	1,4 dioxane has been added. Make sure it is spiked
GM-2B (032619) (680-166589-10)	3/26/19	14:35 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	3-29-19 1422		[signature]	3/30/19 1215	FAED
2	Relinquished by:	Date/Time:	Company	Received by: Federal Express	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: 700330, 700331	Cooler Temperature(s) °C and Other Remarks: 3.6°, 5.4° IR#9

Ver: 01/16/2019

4/18/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559806.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166589-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/9/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-16M (032619) (680-166589-11)	3/26/19	09:10 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-16S (032619) (680-166589-12)	3/26/19	09:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-26M (032619) (680-166589-13)	3/26/19	12:40 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-26S (032619) (680-166589-14)	3/26/19	13:50 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-30M (032619) (680-166589-15)	3/26/19	11:10 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-31M (032619) (680-166589-16)	3/26/19	12:20 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-31S (032619) (680-166589-17)	3/26/19	11:05 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
DUP05 (032619) (680-166589-18)	3/26/19	08:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 3-29-19 1422	Company	Received by:	Date/Time: 3/30/19 1215	Company TAEdi
Relinquished by:	Date/Time:	Company	Received by: Fedex Sat	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☒ Yes ☐ No	Custody Seal No.: 700330, 700331	Cooler Temperature(s) °C and Other Remarks: 3.6, 5.4° IR#9

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4/18/2019

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559808.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166589-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/9/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-21M (032519) (680-166589-1)	3/25/19	15:00 Eastern		Water			X	1	
GM-21S (032519) (680-166589-2)	3/25/19	13:40 Eastern		Water			X	1	
GM-22M (032519) (680-166589-3)	3/25/19	12:45 Eastern		Water			X	1	
GM-22S (032519) (680-166589-4)	3/25/19	13:55 Eastern		Water			X	1	
GM-32 (032519) (680-166589-5)	3/25/19	10:20 Eastern		Water			X	1	
GM-32D (032519) (680-166589-6)	3/25/19	10:25 Eastern		Water			X	1	
DUP04 (032519) (680-166589-7)	3/25/19	12:00 Eastern		Water			X	1	
EB-02 (032519) (680-166589-9)	3/25/19	Eastern		Water			X	2	
GM-2B (032619) (680-166589-10)	3/26/19	14:35 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5-30-19 0935	Company TAL SAV

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: (3.2°C) FEDEX

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559808.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166589-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/9/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-16M (032619) (680-166589-11)	3/26/19	09:10 Eastern		Water			X	1	
GM-16S (032619) (680-166589-12)	3/26/19	09:00 Eastern		Water			X	1	
GM-26M (032619) (680-166589-13)	3/26/19	12:40 Eastern		Water			X	1	
GM-26S (032619) (680-166589-14)	3/26/19	13:50 Eastern		Water			X	1	
GM-30M (032619) (680-166589-15)	3/26/19	11:10 Eastern		Water			X	1	
GM-31M (032619) (680-166589-16)	3/26/19	12:20 Eastern		Water			X	1	
GM-31S (032619) (680-166589-17)	3/26/19	11:05 Eastern		Water			X	1	
DUP05 (032619) (680-166589-18)	3/26/19	08:00 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3.29.19 1436				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 3/30/19 0930	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: (3.2°C) RE SAT

Ver: 01/16/2019

4/18/2019

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166589-1

Login Number: 166589

List Source: Eurofins TestAmerica, Savannah

List Number: 1

Creator: Laughlin, Paul D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166589-1

Login Number: 166589
List Number: 3
Creator: Villanueva, Angelica P

List Source: Eurofins TestAmerica, Edison
List Creation: 03/31/19 08:31 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	CS#700330, 700331
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	3.6°C, 5.4°C IR#9
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166589-1

Login Number: 166589
List Number: 2
Creator: Doerr, Bret C

List Source: Eurofins TestAmerica, Phoenix
List Creation: 03/30/19 10:53 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166589-1

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	250	12-31-19

Laboratory: Eurofins TestAmerica, Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-19
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

Laboratory: Eurofins TestAmerica, Phoenix

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP		154268	07-01-19
AIHA-LAP, LLC	IHLAP		154268	07-01-19
Arizona	State Program	9	AZ0728	06-09-19
California	LA Cty Sanitation Districts	9	9254471	04-10-19 *
California	State Program	9	2941	06-09-19
Nevada	State Program	9	AZ01030	07-31-19
Oregon	NELAP	10	AZ100001	03-09-20
USDA	Federal		P330-16-00302	08-27-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

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ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-166627-1
Client Project/Site: ATK Orbital Elkton

For:
ARCADIS U.S., Inc.
7550 Teague Road
Suite 210
Hanover, Maryland 21076

Attn: Ms. Tina Armstrong

Authorized for release by:
4/18/2019 9:15:26 AM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 680-166627-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: ATK Orbital Elkton

Report Number: 680-166627-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT

The samples were received on 03/29/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5º C and 3.0º C

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples SW7B (032719) (680-166627-1), SW6D (032719) (680-166627-2), PW6D (032719) (680-166627-3), SW6C (032719) (680-166627-4), PW6C (032719) (680-166627-5), SW6B (032719) (680-166627-6), PW2B (032719) (680-166627-7), SW2B (032719) (680-166627-8), SW1C (032719) (680-166627-9), DUP06 (032719) (680-166627-10), EB-03 (032719) (680-166627-11) and Trip Blank (680-166627-12) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 04/09/2019 and 04/10/2019.

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 680-565539 recovered outside control limits for the following analytes: Bromomethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

The following analyte(s) recovered outside control limits for the LCSD associated with analytical batch 680-565539: 1,1-Dichloroethene. This is not indicative of a systematic control problem because these were random marginal exceedances. Qualified results have been reported.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 680-565539 recovered outside control limits for the following analytes: 1,1-Dichloroethene.

The following analyte(s) recovered outside control limits for the LCS associated with analytical batch 680-565669: 2-Chloroethyl vinyl ether. This is not indicative of a systematic control problem because these were random marginal exceedances. Qualified results have been reported.

The following analyte(s) recovered outside control limits for the LCSD associated with analytical batch 680-565669: Bromomethane. This is not indicative of a systematic control problem because these were random marginal exceedances. Qualified results have been reported.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 680-565669 recovered outside control limits for the following analytes: 2,2-Dichloropropane, Hexachlorobutadiene, Vinyl acetate and Bromomethane.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-565696 recovered outside control limits for the following analytes: Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Job ID: 680-166627-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

Sample PW6C (032719) (680-166627-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-565538, 680-565539, and 680-565693.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (AQUEOUS)

Samples PW2B (032719) (680-166627-7), SW2B (032719) (680-166627-8), SW1C (032719) (680-166627-9) and DUP06 (032719) (680-166627-10) were analyzed for Semivolatile Organic Compounds (Aqueous) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 04/02/2019 and 04/09/2019 and analyzed on 04/03/2019 and 04/10/2019.

Due to multiple QC/surrogate failures the samples were re-prepped outside of holding time. Sample PW2B (032719) (680-166627-7) was chosen for batch MS/MSD and was not reprepped due to insufficient volume. Both sets of data have been reported.

Surrogate recovery was outside acceptance limits for the following matrix spike/matrix spike duplicate (MS/MSD) samples: (680-166627-C-7-A MS) and (680-166627-C-7-B MSD). The parent sample's surrogate recovery was within limits. The MS/MSD sample has been qualified and reported.

The laboratory control sample (LCS) for preparation batch 680-564685 and analytical batch 680-564905 recovered outside control limits for multiple analytes. The associated sample was re-prepared and/or re-analyzed outside holding time. Both sets of data have been reported.

2-Fluorophenol, Nitrobenzene-d5 and Phenol-d5 failed the surrogate recovery criteria low for DUP06 (032719) (680-166627-10). 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5 and Phenol-d5 failed the surrogate recovery criteria low for MB 680-564685/8-A. 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5 and Phenol-d5 failed the surrogate recovery criteria low for LCS 680-564685/9-A. 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5 and Phenol-d5 failed the surrogate recovery criteria low for PW2B (032719)MS (680-166627-7MS). 2-Fluorophenol, Nitrobenzene-d5 and Phenol-d5 failed the surrogate recovery criteria low for PW2B (032719)MSD (680-166627-7MSD). Refer to the QC report for details.

Several analytes failed the recovery criteria low for LCS 680-564685/9-A. Refer to the QC report for details.

Several analytes failed the recovery criteria low for the MS/MSD of sample PW2B (032719) (680-166627-7) in batch 680-564905.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS BY GCMS - LOW LEVEL

Samples SW7B (032719) (680-166627-1), SW6D (032719) (680-166627-2), PW6D (032719) (680-166627-3), SW6C (032719) (680-166627-4), PW6C (032719) (680-166627-5), SW6B (032719) (680-166627-6) and EB-03 (032719) (680-166627-11) were analyzed for Semivolatile Organic Compounds by GCMS - Low Level in accordance with EPA SW-846 Method 8270D. The samples were prepared on 04/03/2019 and analyzed on 04/03/2019 and 04/04/2019.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch preparation batch 460-600045 and analytical batch 460-600192 recovered outside control limits for the following analytes: 1,4-Dioxane.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCHLORATE (IC)

Samples SW7B (032719) (680-166627-1), SW6D (032719) (680-166627-2), PW6D (032719) (680-166627-3), SW6C (032719)

Job ID: 680-166627-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

(680-166627-4), PW6C (032719) (680-166627-5), SW6B (032719) (680-166627-6), PW2B (032719) (680-166627-7), SW2B (032719) (680-166627-8), SW1C (032719) (680-166627-9), DUP06 (032719) (680-166627-10) and EB-03 (032719) (680-166627-11) were analyzed for perchlorate (IC) in accordance with EPA Method 314.0. The samples were analyzed on 04/10/2019, 04/11/2019 and 04/13/2019.

Sample PW6D (032719) (680-166627-3)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP) - DISSOLVED

Samples PW6D (032719) (680-166627-3), PW6C (032719) (680-166627-5) and PW2B (032719) (680-166627-7) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/04/2019 and analyzed on 04/10/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)

Samples PW2B (032719) (680-166627-7), SW2B (032719) (680-166627-8), SW1C (032719) (680-166627-9) and DUP06 (032719) (680-166627-10) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/04/2019 and analyzed on 04/10/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY

Samples PW2B (032719) (680-166627-7), SW2B (032719) (680-166627-8), SW1C (032719) (680-166627-9) and DUP06 (032719) (680-166627-10) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 04/11/2019.

Mercury was detected in method blank MB 680-565935/13-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples PW6D (032719) (680-166627-3), PW6C (032719) (680-166627-5) and PW2B (032719) (680-166627-7) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 04/11/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples PW6D (032719) (680-166627-3), PW6C (032719) (680-166627-5) and PW2B (032719) (680-166627-7) were analyzed for total organic carbon in accordance with SM 5310B. The samples were analyzed on 04/13/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-166627-1	SW7B (032719)	Water	03/27/19 12:00	03/29/19 09:01
680-166627-2	SW6D (032719)	Water	03/27/19 11:30	03/29/19 09:01
680-166627-3	PW6D (032719)	Water	03/27/19 10:45	03/29/19 09:01
680-166627-4	SW6C (032719)	Water	03/27/19 11:15	03/29/19 09:01
680-166627-5	PW6C (032719)	Water	03/27/19 10:30	03/29/19 09:01
680-166627-6	SW6B (032719)	Water	03/27/19 11:00	03/29/19 09:01
680-166627-7	PW2B (032719)	Water	03/27/19 09:00	03/29/19 09:01
680-166627-8	SW2B (032719)	Water	03/27/19 09:10	03/29/19 09:01
680-166627-9	SW1C (032719)	Water	03/27/19 08:20	03/29/19 09:01
680-166627-10	DUP06 (032719)	Water	03/27/19 08:00	03/29/19 09:01
680-166627-11	EB-03 (032719)	Water	03/27/19 00:00	03/29/19 09:01
680-166627-12	Trip Blank	Water	03/27/19 00:00	03/29/19 09:01

Method Summary

Client: ARCADIS U.S., Inc.
Job ID: 680-166627-1
Project/Site: ATK Orbital Elkton

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL EDI
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
314.0	Perchlorate (IC)	EPA	TAL PHX
6010C	Metals (ICP)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
5310 B-2011	Organic Carbon, Total (TOC)	SM	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL EDI
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV
7470A	Preparation, Mercury	SW846	TAL SAV

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
*	LCS or LCSD is outside acceptance limits.
F1	MS and/or MSD Recovery is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW7B (032719) — Lab Sample ID: 680-166627-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	4.7		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	2.0		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: SW6D (032719) — Lab Sample ID: 680-166627-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	14		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	1.1		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	16	*	1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	14		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	5.4		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	24		1.0	0.48	ug/L	1		8260B	Total/NA
Vinyl chloride	1.1		1.0	0.50	ug/L	1		8260B	Total/NA
1,4-Dioxane	1.6	*	0.40	0.17	ug/L	1		8270D SIM	Total/NA
Perchlorate	4.4		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: PW6D (032719) — Lab Sample ID: 680-166627-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	8.3		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	2.1		1.0	0.38	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	37	*	1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	8.3		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	11		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene	160		1.0	0.48	ug/L	1		8260B	Total/NA
Vinyl chloride	2.0		1.0	0.50	ug/L	1		8260B	Total/NA
1,4-Dioxane	3.7	*	0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	15		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	57		10	3.1	ug/L	10		314.0	Total/NA
Dissolved Iron	270		50	17	ug/L	1		6010C	Dissolved
Total Organic Carbon	1.1		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: SW6C (032719) — Lab Sample ID: 680-166627-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	4.6		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	1.5		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: PW6C (032719) — Lab Sample ID: 680-166627-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.65	J	1.0	0.50	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	8.1		1.0	0.41	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	3.5		1.0	0.38	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.61	J	1.0	0.50	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	77	*	1.0	0.36	ug/L	1		8260B	Total/NA
1,2-Dichloroethene, Total	8.1		2.0	0.37	ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	27		1.0	0.37	ug/L	1		8260B	Total/NA
Trichloroethene - DL	370		5.0	2.4	ug/L	5		8260B	Total/NA
1,4-Dioxane	4.7	*	0.40	0.17	ug/L	1		8270D SIM	Total/NA
Sulfate	17		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	28		1.0	0.31	ug/L	1		314.0	Total/NA
Total Organic Carbon	2.0		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6B (032719) — Lab Sample ID: 680-166627-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	3.8		1.0	0.48	ug/L	1		8260B	Total/NA
Perchlorate	1.6		1.0	0.31	ug/L	1		314.0	Total/NA

Client Sample ID: PW2B (032719) — Lab Sample ID: 680-166627-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroethane	2.8	J	5.0	2.5	ug/L	1		8260B	Total/NA
1,1-Dichloroethene	19	*	1.0	0.36	ug/L	1		8260B	Total/NA
Vinyl chloride	1.5		1.0	0.50	ug/L	1		8260B	Total/NA
Sulfate	9.9		1.0	0.40	mg/L	1		300.0-1993 R2.1	Total/NA
Perchlorate	0.42	J	1.0	0.31	ug/L	1		314.0	Total/NA
Aluminum	2000		200	24	ug/L	1		6010C	Total Recoverable
Barium	64		10	1.7	ug/L	1		6010C	Total Recoverable
Beryllium	0.16	J	4.0	0.10	ug/L	1		6010C	Total Recoverable
Calcium	7800		500	25	ug/L	1		6010C	Total Recoverable
Chromium	12		10	1.6	ug/L	1		6010C	Total Recoverable
Cobalt	12		10	1.0	ug/L	1		6010C	Total Recoverable
Copper	3.4	J	20	1.8	ug/L	1		6010C	Total Recoverable
Iron	12000		50	17	ug/L	1		6010C	Total Recoverable
Lead	7.8	J	10	3.9	ug/L	1		6010C	Total Recoverable
Magnesium	5100		500	33	ug/L	1		6010C	Total Recoverable
Manganese	820		10	1.0	ug/L	1		6010C	Total Recoverable
Nickel	21	J	40	2.1	ug/L	1		6010C	Total Recoverable
Potassium	900	J	1000	17	ug/L	1		6010C	Total Recoverable
Sodium	12000		1000	480	ug/L	1		6010C	Total Recoverable
Vanadium	5.1	J	10	1.0	ug/L	1		6010C	Total Recoverable
Zinc	28		20	7.0	ug/L	1		6010C	Total Recoverable
Dissolved Iron	9900		50	17	ug/L	1		6010C	Dissolved
Mercury	0.12	J B	0.20	0.080	ug/L	1		7470A	Total/NA
Total Organic Carbon	1.7		1.0	0.50	mg/L	1		5310 B-2011	Total/NA

Client Sample ID: SW2B (032719) — Lab Sample ID: 680-166627-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perchlorate	0.80	J	1.0	0.31	ug/L	1		314.0	Total/NA
Aluminum	55	J	200	24	ug/L	1		6010C	Total Recoverable
Barium	36		10	1.7	ug/L	1		6010C	Total Recoverable
Calcium	13000		500	25	ug/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Savannah

Client Sample ID: SW2B (032719) (Continued)

Lab Sample ID: 680-166627-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	140		50	17	ug/L	1		6010C	Total Recoverable
Magnesium	8000		500	33	ug/L	1		6010C	Total Recoverable
Manganese	30		10	1.0	ug/L	1		6010C	Total Recoverable
Potassium	2000		1000	17	ug/L	1		6010C	Total Recoverable
Sodium	15000		1000	480	ug/L	1		6010C	Total Recoverable

Client Sample ID: SW1C (032719)

Lab Sample ID: 680-166627-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perchlorate	0.53	J	1.0	0.31	ug/L	1		314.0	Total/NA
Aluminum	91	J	200	24	ug/L	1		6010C	Total Recoverable
Barium	42		10	1.7	ug/L	1		6010C	Total Recoverable
Calcium	13000		500	25	ug/L	1		6010C	Total Recoverable
Iron	210		50	17	ug/L	1		6010C	Total Recoverable
Magnesium	8300		500	33	ug/L	1		6010C	Total Recoverable
Manganese	34		10	1.0	ug/L	1		6010C	Total Recoverable
Potassium	2200		1000	17	ug/L	1		6010C	Total Recoverable
Sodium	16000		1000	480	ug/L	1		6010C	Total Recoverable
Vanadium	1.0	J	10	1.0	ug/L	1		6010C	Total Recoverable
Mercury	0.082	J B	0.20	0.080	ug/L	1		7470A	Total/NA

Client Sample ID: DUP06 (032719)

Lab Sample ID: 680-166627-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perchlorate	0.83	J	1.0	0.31	ug/L	1		314.0	Total/NA
Aluminum	58	J	200	24	ug/L	1		6010C	Total Recoverable
Barium	36		10	1.7	ug/L	1		6010C	Total Recoverable
Calcium	13000		500	25	ug/L	1		6010C	Total Recoverable
Iron	160		50	17	ug/L	1		6010C	Total Recoverable
Lead	5.3	J	10	3.9	ug/L	1		6010C	Total Recoverable
Magnesium	8200		500	33	ug/L	1		6010C	Total Recoverable
Manganese	31		10	1.0	ug/L	1		6010C	Total Recoverable
Nickel	3.1	J	40	2.1	ug/L	1		6010C	Total Recoverable
Potassium	2100		1000	17	ug/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: DUP06 (032719) (Continued)
Lab Sample ID: 680-166627-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	15000		1000	480	ug/L	1		6010C	Total Recoverable
Mercury	0.084	J B	0.20	0.080	ug/L	1		7470A	Total/NA

Client Sample ID: EB-03 (032719)
Lab Sample ID: 680-166627-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	14		10	7.0	ug/L	1		8260B	Total/NA

Client Sample ID: Trip Blank
Lab Sample ID: 680-166627-12

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW7B (032719)
Date Collected: 03/27/19 12:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 17:09	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 17:09	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 17:09	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 17:09	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 17:09	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 17:09	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 17:09	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 17:09	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 17:09	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 17:09	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 17:09	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 17:09	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 17:09	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 17:09	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 17:09	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 17:09	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 17:09	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
1,1-Dichloroethene	<1.0	*	1.0	0.36	ug/L			04/09/19 17:09	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 17:09	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 17:09	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 17:09	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 17:09	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 17:09	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 17:09	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 17:09	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:09	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 17:09	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 17:09	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 17:09	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 17:09	1

Client Sample ID: SW7B (032719)
Date Collected: 03/27/19 12:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 17:09	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 17:09	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 17:09	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Trichloroethene	**4.7**		1.0	0.48	ug/L			04/09/19 17:09	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 17:09	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:09	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 17:09	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 17:09	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/09/19 17:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/09/19 17:09*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 17:09*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/09/19 17:09*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 21:57	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 21:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*96*		*38 - 125*	*04/03/19 09:50*	*04/03/19 21:57*	*1*
Terphenyl-d14	*88*		*70 - 130*	*04/03/19 09:50*	*04/03/19 21:57*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**2.0**		1.0	0.31	ug/L			04/10/19 23:14	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6D (032719)
Date Collected: 03/27/19 11:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 17:37	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 17:37	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 17:37	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 17:37	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 17:37	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 17:37	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 17:37	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 17:37	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 17:37	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
cis-1,2-Dichloroethene	**14**		1.0	0.41	ug/L			04/09/19 17:37	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 17:37	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 17:37	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 17:37	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 17:37	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 17:37	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 17:37	1
1,1-Dichloroethane	**1.1**		1.0	0.38	ug/L			04/09/19 17:37	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
1,1-Dichloroethene	**16**	*	1.0	0.36	ug/L			04/09/19 17:37	1
1,2-Dichloroethene, Total	**14**		2.0	0.37	ug/L			04/09/19 17:37	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 17:37	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 17:37	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 17:37	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 17:37	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 17:37	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 17:37	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:37	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 17:37	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 17:37	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 17:37	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 17:37	1

Client Sample ID: SW6D (032719)
Date Collected: 03/27/19 11:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 17:37	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 17:37	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 17:37	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
1,1,1-Trichloroethane	**5.4**		1.0	0.37	ug/L			04/09/19 17:37	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Trichloroethene	**24**		1.0	0.48	ug/L			04/09/19 17:37	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 17:37	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:37	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 17:37	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 17:37	1
Vinyl chloride	**1.1**		1.0	0.50	ug/L			04/09/19 17:37	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 17:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*04/09/19 17:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*		*04/09/19 17:37*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/09/19 17:37*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/09/19 17:37*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.6**	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 22:18	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 22:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*107*		*38 - 125*	*04/03/19 09:50*	*04/03/19 22:18*	*1*
Terphenyl-d14	*98*		*70 - 130*	*04/03/19 09:50*	*04/03/19 22:18*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4.4**		1.0	0.31	ug/L			04/10/19 23:37	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6D (032719)
Date Collected: 03/27/19 10:45
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:03	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:03	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 18:03	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:03	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:03	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:03	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 18:03	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:03	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:03	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
cis-1,2-Dichloroethene	**8.3**		1.0	0.41	ug/L			04/09/19 18:03	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:03	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:03	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:03	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:03	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:03	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:03	1
1,1-Dichloroethane	**2.1**		1.0	0.38	ug/L			04/09/19 18:03	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
1,1-Dichloroethene	**37**	*	1.0	0.36	ug/L			04/09/19 18:03	1
1,2-Dichloroethene, Total	**8.3**		2.0	0.37	ug/L			04/09/19 18:03	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:03	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:03	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:03	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:03	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:03	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:03	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:03	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:03	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:03	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:03	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:03	1

Client Sample ID: PW6D (032719)
Date Collected: 03/27/19 10:45
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:03	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:03	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:03	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
1,1,1-Trichloroethane	**11**		1.0	0.37	ug/L			04/09/19 18:03	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Trichloroethene	**160**		1.0	0.48	ug/L			04/09/19 18:03	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:03	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:03	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:03	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:03	1
Vinyl chloride	**2.0**		1.0	0.50	ug/L			04/09/19 18:03	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/09/19 18:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 18:03*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 18:03*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 18:03*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.7**	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 22:40	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 22:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*106*		*38 - 125*	*04/03/19 09:50*	*04/03/19 22:40*	*1*
Terphenyl-d14	*97*		*70 - 130*	*04/03/19 09:50*	*04/03/19 22:40*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**15**		1.0	0.40	mg/L			04/11/19 20:17	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**57**		10	3.1	ug/L			04/13/19 01:59	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**270**		50	17	ug/L		04/04/19 13:37	04/10/19 22:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0	0.50	mg/L			04/13/19 21:46	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6C (032719)
Date Collected: 03/27/19 11:15
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:29	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:29	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 18:29	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:29	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:29	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:29	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 18:29	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:29	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:29	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 18:29	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:29	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:29	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:29	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:29	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:29	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:29	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 18:29	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
1,1-Dichloroethene	<1.0	*	1.0	0.36	ug/L			04/09/19 18:29	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 18:29	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:29	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:29	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:29	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:29	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:29	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:29	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:29	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:29	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:29	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:29	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:29	1

Client Sample ID: SW6C (032719)
Date Collected: 03/27/19 11:15
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:29	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:29	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:29	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Trichloroethene	**4.6**		1.0	0.48	ug/L			04/09/19 18:29	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:29	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:29	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:29	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:29	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/09/19 18:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 18:29*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 18:29*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 18:29*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:01	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:01*	*1*
Terphenyl-d14	*90*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:01*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.5**		1.0	0.31	ug/L			04/11/19 00:23	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:54	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:54	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:54	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 18:54	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:54	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:54	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:54	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 18:54	1
Chloroform	**0.65**	**J**	1.0	0.50	ug/L			04/09/19 18:54	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:54	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:54	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
cis-1,2-Dichloroethene	**8.1**		1.0	0.41	ug/L			04/09/19 18:54	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:54	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:54	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:54	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:54	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:54	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:54	1
1,1-Dichloroethane	**3.5**		1.0	0.38	ug/L			04/09/19 18:54	1
1,2-Dichloroethane	**0.61**	**J**	1.0	0.50	ug/L			04/09/19 18:54	1
1,1-Dichloroethene	**77**	*	1.0	0.36	ug/L			04/09/19 18:54	1
1,2-Dichloroethene, Total	**8.1**		2.0	0.37	ug/L			04/09/19 18:54	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:54	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:54	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:54	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:54	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:54	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:54	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:54	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:54	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:54	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:54	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:54	1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:54	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:54	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:54	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
1,1,1-Trichloroethane	**27**		1.0	0.37	ug/L			04/09/19 18:54	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:54	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:54	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:54	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:54	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 18:54	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 18:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 18:54*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 18:54*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/09/19 18:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**370**		5.0	2.4	ug/L			04/10/19 12:47	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/10/19 12:47*	*5*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*04/10/19 12:47*	*5*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*04/10/19 12:47*	*5*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*04/10/19 12:47*	*5*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4.7**	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:22	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*107*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:22*	*1*
Terphenyl-d14	*95*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:22*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**17**		1.0	0.40	mg/L			04/11/19 20:30	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**28**		1.0	0.31	ug/L			04/11/19 00:46	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/04/19 13:37	04/10/19 21:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	2.0		1.0	0.50	mg/L			04/13/19 22:03	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6B (032719)
Date Collected: 03/27/19 11:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:20	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:20	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 19:20	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:20	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:20	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:20	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 19:20	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:20	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:20	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:20	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:20	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:20	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:20	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:20	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:20	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:20	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:20	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
1,1-Dichloroethene	<1.0	*	1.0	0.36	ug/L			04/09/19 19:20	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:20	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:20	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:20	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:20	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:20	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:20	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:20	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:20	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:20	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:20	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:20	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:20	1

Client Sample ID: SW6B (032719)
Date Collected: 03/27/19 11:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:20	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:20	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:20	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Trichloroethene	**3.8**		1.0	0.48	ug/L			04/09/19 19:20	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:20	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:20	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:20	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:20	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 19:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 19:20*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 19:20*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 19:20*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	*	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:43	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:43*	*1*
Terphenyl-d14	*92*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:43*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.6**		1.0	0.31	ug/L			04/11/19 01:08	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:46	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:46	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 19:46	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:46	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:46	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:46	1
Chloroethane	**2.8**	**J**	5.0	2.5	ug/L			04/09/19 19:46	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 19:46	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:46	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:46	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:46	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:46	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:46	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:46	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:46	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:46	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:46	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:46	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
1,1-Dichloroethene	**19**	*****	1.0	0.36	ug/L			04/09/19 19:46	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:46	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:46	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:46	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:46	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:46	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:46	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:46	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:46	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:46	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:46	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:46	1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:46	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:46	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:46	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:46	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:46	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:46	1
Vinyl chloride	**1.5**		1.0	0.50	ug/L			04/09/19 19:46	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/09/19 19:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 19:46*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/09/19 19:46*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 19:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	* F1	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
Acenaphthylene	<9.9	* F1	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 19:57	1
Acetophenone	<9.9	* F1	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 19:57	1
Anthracene	<9.9	* F1	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 19:57	1
Atrazine	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[a]anthracene	<9.9		9.9	0.55	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,1'-Biphenyl	<9.9	* F1	9.9	0.58	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-chloroethoxy)methane	<9.9	* F1	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-chloroethyl)ether	<9.9	* F1	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
bis (2-chloroisopropyl) ether	<9.9	* F1	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Bromophenyl phenyl ether	<9.9	* F1	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 19:57	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
Caprolactam	<9.9	* F1	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
Carbazole	<9.9	F1	9.9	0.70	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chloroaniline	<20	* F1	20	2.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chloro-3-methylphenol	<9.9	* F1	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	* F1	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Chlorophenol	<9.9	* F1	9.9	0.86	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chlorophenyl phenyl ether	<9.9	* F1	9.9	0.83	ug/L		04/02/19 11:58	04/03/19 19:57	1
Chrysene	<9.9		9.9	0.51	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dibenzofuran	<9.9	* F1	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,2-Dichlorobenzene	<9.9	* F1	9.9	0.53	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,3-Dichlorobenzene	<9.9	* F1	9.9	0.59	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,4-Dichlorobenzene	<9.9	* F1	9.9	0.54	ug/L		04/02/19 11:58	04/03/19 19:57	1
3,3'-Dichlorobenzidine	<60	F1	60	30	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dichlorophenol	<9.9	* F1	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Diethyl phthalate	<9.9	* F1	9.9	0.87	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dimethylphenol	<9.9	* F1	9.9	4.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dimethyl phthalate	<9.9	* F1	9.9	0.98	ug/L		04/02/19 11:58	04/03/19 19:57	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 19:57	1
4,6-Dinitro-2-methylphenol	<50	F1	50	9.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dinitrophenol	<50	F1	50	9.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dinitrotoluene	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,6-Dinitrotoluene	<9.9	* F1	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 19:57	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 19:57	1
Fluorene	<9.9	* F1	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorobenzene	<9.9	* F1	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorobutadiene	<9.9	* F1	9.9	0.62	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorocyclopentadiene	<9.9	* F1	9.9	2.5	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachloroethane	<9.9	* F1	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1
Isophorone	<9.9	* F1	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Methylnaphthalene	<9.9	* F1	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Methylphenol	<9.9	* F1	9.9	0.88	ug/L		04/02/19 11:58	04/03/19 19:57	1
3 & 4 Methylphenol	<9.9	* F1	9.9	1.3	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Nitroaniline	<50	* F1	50	1.3	ug/L		04/02/19 11:58	04/03/19 19:57	1
3-Nitroaniline	<50	* F1	50	5.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Nitroaniline	<50	* F1	50	5.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Nitrobenzene	<9.9	* F1	9.9	0.72	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Nitrophenol	<9.9	* F1	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Nitrophenol	<50	F1	50	1.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
N-Nitrosodi-n-propylamine	<9.9	* F1	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 19:57	1
N-Nitrosodiphenylamine	<9.9	* F1	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 19:57	1
Pentachlorophenol	<50		50	2.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Phenanthrene	<9.9	* F1	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 19:57	1
Phenol	<9.9	* F1	9.9	0.82	ug/L		04/02/19 11:58	04/03/19 19:57	1
Pyrene	<9.9		9.9	0.63	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,2,4-Trichlorobenzene	<9.9	* F1	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4,5-Trichlorophenol	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4,6-Trichlorophenol	<9.9	* F1	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 19:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*62*		*32 - 113*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/02/19 11:58*	*04/03/19 19:57*	*1*

Client Sample ID: PW2B (032719)

Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*62*		*32 - 118*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
Phenol-d5	*54*		*27 - 110*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
Terphenyl-d14	*42*		*10 - 126*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
2,4,6-Tribromophenol	*79*		*39 - 124*	*04/02/19 11:58*	*04/03/19 19:57*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**9.9**		1.0	0.40	mg/L			04/11/19 20:43	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.42**	**J**	1.0	0.31	ug/L			04/11/19 01:31	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2000**		200	24	ug/L		04/04/19 13:37	04/10/19 21:46	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:46	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:46	1
Barium	**64**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:46	1
Beryllium	**0.16**	**J**	4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:46	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Calcium	**7800**		500	25	ug/L		04/04/19 13:37	04/10/19 21:46	1
Chromium	**12**		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:46	1
Cobalt	**12**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Copper	**3.4**	**J**	20	1.8	ug/L		04/04/19 13:37	04/10/19 21:46	1
Iron	**12000**		50	17	ug/L		04/04/19 13:37	04/10/19 21:46	1
Lead	**7.8**	**J**	10	3.9	ug/L		04/04/19 13:37	04/10/19 21:46	1
Magnesium	**5100**		500	33	ug/L		04/04/19 13:37	04/10/19 21:46	1
Manganese	**820**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Nickel	**21**	**J**	40	2.1	ug/L		04/04/19 13:37	04/10/19 21:46	1
Potassium	**900**	**J**	1000	17	ug/L		04/04/19 13:37	04/10/19 21:46	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:46	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:46	1
Sodium	**12000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:46	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Vanadium	**5.1**	**J**	10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Zinc	**28**		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:46	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**9900**		50	17	ug/L		04/04/19 13:37	04/10/19 22:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.12**	**J B**	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.7**		1.0	0.50	mg/L			04/13/19 22:20	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 20:11	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 20:11	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 20:11	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 20:11	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 20:11	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 20:11	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 20:11	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 20:11	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 20:11	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 20:11	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 20:11	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 20:11	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 20:11	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 20:11	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 20:11	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 20:11	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 20:11	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
1,1-Dichloroethene	<1.0	*	1.0	0.36	ug/L			04/09/19 20:11	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 20:11	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 20:11	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 20:11	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 20:11	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 20:11	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 20:11	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 20:11	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 20:11	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 20:11	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 20:11	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 20:11	1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 20:11	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 20:11	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 20:11	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 20:11	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 20:11	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 20:11	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 20:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 20:11*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 20:11*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*04/09/19 20:11*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
Acenaphthylene	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:21	1
Acetophenone	<9.9	*	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 20:21	1
Anthracene	<9.9	*	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 20:21	1
Atrazine	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[a]anthracene	<9.9		9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,1'-Biphenyl	<9.9	*	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-chloroethoxy)methane	<9.9	*	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-chloroethyl)ether	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
bis (2-chloroisopropyl) ether	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Bromophenyl phenyl ether	<9.9	*	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:21	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
Caprolactam	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
Carbazole	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chloroaniline	<20	*	20	2.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chloro-3-methylphenol	<9.9	*	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	*	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Chlorophenol	<9.9	*	9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chlorophenyl phenyl ether	<9.9	*	9.9	0.83	ug/L		04/02/19 11:58	04/03/19 20:21	1
Chrysene	<9.9		9.9	0.50	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dibenzofuran	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,2-Dichlorobenzene	<9.9	*	9.9	0.52	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,3-Dichlorobenzene	<9.9	*	9.9	0.58	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,4-Dichlorobenzene	<9.9	*	9.9	0.53	ug/L		04/02/19 11:58	04/03/19 20:21	1
3,3'-Dichlorobenzidine	<59		59	30	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dichlorophenol	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Diethyl phthalate	<9.9	*	9.9	0.87	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dimethylphenol	<9.9	*	9.9	3.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dimethyl phthalate	<9.9	*	9.9	0.98	ug/L		04/02/19 11:58	04/03/19 20:21	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:21	1
4,6-Dinitro-2-methylphenol	<49		49	9.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dinitrophenol	<49		49	9.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dinitrotoluene	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,6-Dinitrotoluene	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 20:21	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 20:21	1
Fluorene	<9.9	*	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorobenzene	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorobutadiene	<9.9	*	9.9	0.61	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorocyclopentadiene	<9.9	*	9.9	2.5	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachloroethane	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1
Isophorone	<9.9	*	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Methylnaphthalene	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Methylphenol	<9.9	*	9.9	0.88	ug/L		04/02/19 11:58	04/03/19 20:21	1
3 & 4 Methylphenol	<9.9	*	9.9	1.3	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Nitroaniline	<49	*	49	1.3	ug/L		04/02/19 11:58	04/03/19 20:21	1
3-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
Nitrobenzene	<9.9	*	9.9	0.72	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Nitrophenol	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Nitrophenol	<49		49	1.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
N-Nitrosodi-n-propylamine	<9.9	*	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 20:21	1
N-Nitrosodiphenylamine	<9.9	*	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 20:21	1
Pentachlorophenol	<49		49	2.0	ug/L		04/02/19 11:58	04/03/19 20:21	1
Phenanthrene	<9.9	*	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:21	1
Phenol	<9.9	*	9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:21	1
Pyrene	<9.9		9.9	0.62	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,2,4-Trichlorobenzene	<9.9	*	9.9	0.55	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4,5-Trichlorophenol	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4,6-Trichlorophenol	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*62*		*32 - 113*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/02/19 11:58*	*04/03/19 20:21*	*1*

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*64*		*32 - 118*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
Phenol-d5	*55*		*27 - 110*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
Terphenyl-d14	*24*		*10 - 126*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
2,4,6-Tribromophenol	*73*		*39 - 124*	*04/02/19 11:58*	*04/03/19 20:21*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
Acenaphthylene	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 22:49	1
Acetophenone	<9.9	H	9.9	0.56	ug/L		04/09/19 15:03	04/10/19 22:49	1
Anthracene	<9.9	H	9.9	0.68	ug/L		04/09/19 15:03	04/10/19 22:49	1
Atrazine	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzaldehyde	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[a]anthracene	<9.9	H	9.9	0.54	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[a]pyrene	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[b]fluoranthene	<9.9	H	9.9	2.6	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[g,h,i]perylene	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[k]fluoranthene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,1'-Biphenyl	<9.9	H	9.9	0.57	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-chloroethoxy)methane	<9.9	H	9.9	0.93	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-chloroethyl)ether	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
bis (2-chloroisopropyl) ether	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-ethylhexyl) phthalate	<9.9	H	9.9	1.6	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Bromophenyl phenyl ether	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 22:49	1
Butyl benzyl phthalate	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
Caprolactam	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
Carbazole	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chloroaniline	<20	H	20	2.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chloro-3-methylphenol	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Chloronaphthalene	<9.9	H	9.9	0.79	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Chlorophenol	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chlorophenyl phenyl ether	<9.9	H	9.9	0.83	ug/L		04/09/19 15:03	04/10/19 22:49	1
Chrysene	<9.9	H	9.9	0.50	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dibenz(a,h)anthracene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dibenzofuran	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,2-Dichlorobenzene	<9.9	H	9.9	0.52	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,3-Dichlorobenzene	<9.9	H	9.9	0.58	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,4-Dichlorobenzene	<9.9	H	9.9	0.53	ug/L		04/09/19 15:03	04/10/19 22:49	1
3,3'-Dichlorobenzidine	<59	H	59	30	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dichlorophenol	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Diethyl phthalate	<9.9	H	9.9	0.87	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dimethylphenol	<9.9	H	9.9	3.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dimethyl phthalate	<9.9	H	9.9	0.98	ug/L		04/09/19 15:03	04/10/19 22:49	1
Di-n-butyl phthalate	<9.9	H	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 22:49	1
4,6-Dinitro-2-methylphenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dinitrophenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dinitrotoluene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,6-Dinitrotoluene	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Di-n-octyl phthalate	<9.9	H	9.9	1.4	ug/L		04/09/19 15:03	04/10/19 22:49	1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.9	H	9.9	0.73	ug/L		04/09/19 15:03	04/10/19 22:49	1
Fluorene	<9.9	H	9.9	0.95	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorobenzene	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorobutadiene	<9.9	H	9.9	0.61	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorocyclopentadiene	<9.9	H	9.9	2.5	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachloroethane	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
Indeno[1,2,3-cd]pyrene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
Isophorone	<9.9	H	9.9	0.89	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Methylnaphthalene	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Methylphenol	<9.9	H	9.9	0.88	ug/L		04/09/19 15:03	04/10/19 22:49	1
3 & 4 Methylphenol	<9.9	H	9.9	1.3	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 22:49	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
Nitrobenzene	<9.9	H	9.9	0.72	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Nitrophenol	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
N-Nitrosodi-n-propylamine	<9.9	H	9.9	0.71	ug/L		04/09/19 15:03	04/10/19 22:49	1
N-Nitrosodiphenylamine	<9.9	H	9.9	0.91	ug/L		04/09/19 15:03	04/10/19 22:49	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 22:49	1
Phenanthrene	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 22:49	1
Phenol	<9.9	H	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 22:49	1
Pyrene	<9.9	H	9.9	0.62	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,2,4-Trichlorobenzene	<9.9	H	9.9	0.55	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4,5-Trichlorophenol	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4,6-Trichlorophenol	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*60*		*32 - 113*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
2-Fluorophenol	*48*		*26 - 109*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Nitrobenzene-d5	*61*		*32 - 118*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Phenol-d5	*46*		*27 - 110*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Terphenyl-d14	*13*		*10 - 126*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
2,4,6-Tribromophenol	*76*		*39 - 124*	*04/09/19 15:03*	*04/10/19 22:49*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.80**	**J**	1.0	0.31	ug/L			04/11/19 01:54	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**55**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:42	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:42	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:42	1
Barium	**36**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:42	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:42	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:42	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:42	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:42	1
Iron	**140**		50	17	ug/L		04/04/19 13:37	04/10/19 21:42	1
Lead	<10		10	3.9	ug/L		04/04/19 13:37	04/10/19 21:42	1
Magnesium	**8000**		500	33	ug/L		04/04/19 13:37	04/10/19 21:42	1
Manganese	**30**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Nickel	<40		40	2.1	ug/L		04/04/19 13:37	04/10/19 21:42	1
Potassium	**2000**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:42	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:42	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:42	1
Sodium	**15000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:42	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Vanadium	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:42	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:21	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:29	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:29	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:29	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:29	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:29	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 19:29	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:29	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:29	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:29	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:29	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:29	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:29	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:29	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:29	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:29	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:29	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 19:29	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:29	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:29	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:29	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:29	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:29	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:29	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:29	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:29	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:29	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:29	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:29	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:29	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:29	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:29	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:29	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:29	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:29	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/09/19 19:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/09/19 19:29*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/09/19 19:29*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/09/19 19:29*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
Acenaphthylene	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:46	1
Acetophenone	<9.9	*	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 20:46	1
Anthracene	<9.9	*	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 20:46	1
Atrazine	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[a]anthracene	<9.9		9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,1'-Biphenyl	<9.9	*	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-chloroethoxy)methane	<9.9	*	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-chloroethyl)ether	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
bis (2-chloroisopropyl) ether	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Bromophenyl phenyl ether	<9.9	*	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:46	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
Caprolactam	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
Carbazole	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chloroaniline	<20	*	20	2.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chloro-3-methylphenol	<9.9	*	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	*	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Chlorophenol	<9.9	*	9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chlorophenyl phenyl ether	<9.9	*	9.9	0.83	ug/L		04/02/19 11:58	04/03/19 20:46	1
Chrysene	<9.9		9.9	0.51	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dibenzofuran	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,2-Dichlorobenzene	<9.9	*	9.9	0.53	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,3-Dichlorobenzene	<9.9	*	9.9	0.58	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,4-Dichlorobenzene	<9.9	*	9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:46	1
3,3'-Dichlorobenzidine	<59		59	30	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dichlorophenol	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Diethyl phthalate	<9.9	*	9.9	0.87	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dimethylphenol	<9.9	*	9.9	4.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dimethyl phthalate	<9.9	*	9.9	0.98	ug/L		04/02/19 11:58	04/03/19 20:46	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:46	1
4,6-Dinitro-2-methylphenol	<50		50	9.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dinitrophenol	<50		50	9.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dinitrotoluene	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,6-Dinitrotoluene	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 20:46	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 20:46	1
Fluorene	<9.9	*	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorobenzene	<9.9	*	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorobutadiene	<9.9	*	9.9	0.61	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorocyclopentadiene	<9.9	*	9.9	2.5	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachloroethane	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1
Isophorone	<9.9	*	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Methylnaphthalene	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Methylphenol	<9.9	*	9.9	0.88	ug/L		04/02/19 11:58	04/03/19 20:46	1
3 & 4 Methylphenol	<9.9	*	9.9	1.3	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Nitroaniline	<50	*	50	1.3	ug/L		04/02/19 11:58	04/03/19 20:46	1
3-Nitroaniline	<50	*	50	5.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Nitroaniline	<50	*	50	5.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Nitrobenzene	<9.9	*	9.9	0.72	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Nitrophenol	<9.9	*	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Nitrophenol	<50		50	1.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
N-Nitrosodi-n-propylamine	<9.9	*	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 20:46	1
N-Nitrosodiphenylamine	<9.9	*	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 20:46	1
Pentachlorophenol	<50		50	2.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Phenanthrene	<9.9	*	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:46	1
Phenol	<9.9	*	9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:46	1
Pyrene	<9.9		9.9	0.62	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,2,4-Trichlorobenzene	<9.9	*	9.9	0.55	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4,5-Trichlorophenol	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4,6-Trichlorophenol	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*58*		*32 - 113*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
2-Fluorophenol	*47*		*26 - 109*	*04/02/19 11:58*	*04/03/19 20:46*	*1*

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*56*		*32 - 118*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
Phenol-d5	*50*		*27 - 110*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
Terphenyl-d14	*43*		*10 - 126*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*04/02/19 11:58*	*04/03/19 20:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
Acenaphthylene	<9.8	H	9.8	0.83	ug/L		04/09/19 15:03	04/10/19 23:13	1
Acetophenone	<9.8	H	9.8	0.56	ug/L		04/09/19 15:03	04/10/19 23:13	1
Anthracene	<9.8	H	9.8	0.67	ug/L		04/09/19 15:03	04/10/19 23:13	1
Atrazine	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzaldehyde	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[a]anthracene	<9.8	H	9.8	0.54	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[a]pyrene	<9.8	H	9.8	0.69	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[b]fluoranthene	<9.8	H	9.8	2.5	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[g,h,i]perylene	<9.8	H	9.8	0.85	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[k]fluoranthene	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,1'-Biphenyl	<9.8	H	9.8	0.57	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-chloroethoxy)methane	<9.8	H	9.8	0.92	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-chloroethyl)ether	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
bis (2-chloroisopropyl) ether	<9.8	H	9.8	0.76	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-ethylhexyl) phthalate	<9.8	H	9.8	1.6	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Bromophenyl phenyl ether	<9.8	H	9.8	0.75	ug/L		04/09/19 15:03	04/10/19 23:13	1
Butyl benzyl phthalate	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
Caprolactam	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
Carbazole	<9.8	H	9.8	0.69	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chloroaniline	<20	H	20	2.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chloro-3-methylphenol	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Chloronaphthalene	<9.8	H	9.8	0.78	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Chlorophenol	<9.8	H	9.8	0.85	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chlorophenyl phenyl ether	<9.8	H	9.8	0.82	ug/L		04/09/19 15:03	04/10/19 23:13	1
Chrysene	<9.8	H	9.8	0.50	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dibenz(a,h)anthracene	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dibenzofuran	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,2-Dichlorobenzene	<9.8	H	9.8	0.52	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,3-Dichlorobenzene	<9.8	H	9.8	0.58	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,4-Dichlorobenzene	<9.8	H	9.8	0.53	ug/L		04/09/19 15:03	04/10/19 23:13	1
3,3'-Dichlorobenzidine	<59	H	59	29	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dichlorophenol	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Diethyl phthalate	<9.8	H	9.8	0.86	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dimethylphenol	<9.8	H	9.8	3.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dimethyl phthalate	<9.8	H	9.8	0.97	ug/L		04/09/19 15:03	04/10/19 23:13	1
Di-n-butyl phthalate	<9.8	H	9.8	0.81	ug/L		04/09/19 15:03	04/10/19 23:13	1
4,6-Dinitro-2-methylphenol	<49	H	49	9.8	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dinitrophenol	<49	H	49	9.8	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dinitrotoluene	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,6-Dinitrotoluene	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Di-n-octyl phthalate	<9.8	H	9.8	1.4	ug/L		04/09/19 15:03	04/10/19 23:13	1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.8	H	9.8	0.72	ug/L		04/09/19 15:03	04/10/19 23:13	1
Fluorene	<9.8	H	9.8	0.94	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorobenzene	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorobutadiene	<9.8	H	9.8	0.60	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorocyclopentadiene	<9.8	H	9.8	2.4	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachloroethane	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
Indeno[1,2,3-cd]pyrene	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
Isophorone	<9.8	H	9.8	0.88	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Methylnaphthalene	<9.8	H	9.8	0.76	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Methylphenol	<9.8	H	9.8	0.87	ug/L		04/09/19 15:03	04/10/19 23:13	1
3 & 4 Methylphenol	<9.8	H	9.8	1.3	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 23:13	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
Nitrobenzene	<9.8	H	9.8	0.71	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Nitrophenol	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
N-Nitrosodi-n-propylamine	<9.8	H	9.8	0.70	ug/L		04/09/19 15:03	04/10/19 23:13	1
N-Nitrosodiphenylamine	<9.8	H	9.8	0.90	ug/L		04/09/19 15:03	04/10/19 23:13	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 23:13	1
Phenanthrene	<9.8	H	9.8	0.75	ug/L		04/09/19 15:03	04/10/19 23:13	1
Phenol	<9.8	H	9.8	0.81	ug/L		04/09/19 15:03	04/10/19 23:13	1
Pyrene	<9.8	H	9.8	0.61	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,2,4-Trichlorobenzene	<9.8	H	9.8	0.55	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4,5-Trichlorophenol	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4,6-Trichlorophenol	<9.8	H	9.8	0.83	ug/L		04/09/19 15:03	04/10/19 23:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*63*		*32 - 113*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
2-Fluorophenol	*51*		*26 - 109*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Nitrobenzene-d5	*64*		*32 - 118*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Phenol-d5	*50*		*27 - 110*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Terphenyl-d14	*15*		*10 - 126*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*04/09/19 15:03*	*04/10/19 23:13*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.53**	**J**	1.0	0.31	ug/L			04/11/19 02:17	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**91**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:33	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:33	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:33	1
Barium	**42**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:33	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:33	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:33	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:33	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:33	1
Iron	**210**		50	17	ug/L		04/04/19 13:37	04/10/19 21:33	1
Lead	<10		10	3.9	ug/L		04/04/19 13:37	04/10/19 21:33	1
Magnesium	**8300**		500	33	ug/L		04/04/19 13:37	04/10/19 21:33	1
Manganese	**34**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Nickel	<40		40	2.1	ug/L		04/04/19 13:37	04/10/19 21:33	1
Potassium	**2200**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:33	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:33	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:33	1
Sodium	**16000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:33	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Vanadium	**1.0**	**J**	10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:33	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.082**	**J B**	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:25	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 02:27	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 02:27	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/10/19 02:27	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 02:27	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 02:27	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 02:27	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
2-Chloroethyl vinyl ether	<10	*	10	5.0	ug/L			04/10/19 02:27	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 02:27	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 02:27	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 02:27	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 02:27	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 02:27	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 02:27	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 02:27	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 02:27	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 02:27	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 02:27	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 02:27	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 02:27	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 02:27	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 02:27	1
2,2-Dichloropropane	<1.0	*	1.0	0.37	ug/L			04/10/19 02:27	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 02:27	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Hexachlorobutadiene	<5.0	*	5.0	2.5	ug/L			04/10/19 02:27	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 02:27	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 02:27	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 02:27	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:27	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 02:27	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 02:27	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 02:27	1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 02:27	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 02:27	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 02:27	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:27	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 02:27	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 02:27	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 02:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/10/19 02:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/10/19 02:27*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/10/19 02:27*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 02:27*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.7	*	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
Acenaphthylene	<9.7	*	9.7	0.83	ug/L		04/02/19 11:58	04/03/19 21:11	1
Acetophenone	<9.7	*	9.7	0.55	ug/L		04/02/19 11:58	04/03/19 21:11	1
Anthracene	<9.7	*	9.7	0.67	ug/L		04/02/19 11:58	04/03/19 21:11	1
Atrazine	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzaldehyde	<9.7		9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[a]anthracene	<9.7		9.7	0.53	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[a]pyrene	<9.7		9.7	0.69	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[b]fluoranthene	<9.7		9.7	2.5	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[g,h,i]perylene	<9.7		9.7	0.84	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[k]fluoranthene	<9.7		9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,1'-Biphenyl	<9.7	*	9.7	0.56	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-chloroethoxy)methane	<9.7	*	9.7	0.91	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-chloroethyl)ether	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
bis (2-chloroisopropyl) ether	<9.7	*	9.7	0.76	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-ethylhexyl) phthalate	<9.7		9.7	1.6	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Bromophenyl phenyl ether	<9.7	*	9.7	0.75	ug/L		04/02/19 11:58	04/03/19 21:11	1
Butyl benzyl phthalate	<9.7		9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
Caprolactam	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
Carbazole	<9.7		9.7	0.69	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chloroaniline	<19	*	19	2.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chloro-3-methylphenol	<9.7	*	9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.7	*	9.7	0.78	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Chlorophenol	<9.7	*	9.7	0.84	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chlorophenyl phenyl ether	<9.7	*	9.7	0.82	ug/L		04/02/19 11:58	04/03/19 21:11	1
Chrysene	<9.7		9.7	0.50	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dibenz(a,h)anthracene	<9.7		9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dibenzofuran	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,2-Dichlorobenzene	<9.7	*	9.7	0.51	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,3-Dichlorobenzene	<9.7	*	9.7	0.57	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,4-Dichlorobenzene	<9.7	*	9.7	0.52	ug/L		04/02/19 11:58	04/03/19 21:11	1
3,3'-Dichlorobenzidine	<58		58	29	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dichlorophenol	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Diethyl phthalate	<9.7	*	9.7	0.85	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dimethylphenol	<9.7	*	9.7	3.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dimethyl phthalate	<9.7	*	9.7	0.96	ug/L		04/02/19 11:58	04/03/19 21:11	1
Di-n-butyl phthalate	<9.7		9.7	0.81	ug/L		04/02/19 11:58	04/03/19 21:11	1
4,6-Dinitro-2-methylphenol	<49		49	9.7	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dinitrophenol	<49		49	9.7	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dinitrotoluene	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,6-Dinitrotoluene	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Di-n-octyl phthalate	<9.7		9.7	1.4	ug/L		04/02/19 11:58	04/03/19 21:11	1
Fluoranthene	<9.7		9.7	0.72	ug/L		04/02/19 11:58	04/03/19 21:11	1
Fluorene	<9.7	*	9.7	0.93	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorobenzene	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorobutadiene	<9.7	*	9.7	0.60	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorocyclopentadiene	<9.7	*	9.7	2.4	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachloroethane	<9.7	*	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
Indeno[1,2,3-cd]pyrene	<9.7		9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1
Isophorone	<9.7	*	9.7	0.87	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Methylnaphthalene	<9.7	*	9.7	0.76	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Methylphenol	<9.7	*	9.7	0.86	ug/L		04/02/19 11:58	04/03/19 21:11	1
3 & 4 Methylphenol	<9.7	*	9.7	1.3	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Nitroaniline	<49	*	49	1.3	ug/L		04/02/19 11:58	04/03/19 21:11	1
3-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Nitrobenzene	<9.7	*	9.7	0.71	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Nitrophenol	<9.7	*	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Nitrophenol	<49		49	1.8	ug/L		04/02/19 11:58	04/03/19 21:11	1
N-Nitrosodi-n-propylamine	<9.7	*	9.7	0.70	ug/L		04/02/19 11:58	04/03/19 21:11	1
N-Nitrosodiphenylamine	<9.7	*	9.7	0.89	ug/L		04/02/19 11:58	04/03/19 21:11	1
Pentachlorophenol	<49		49	1.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Phenanthrene	<9.7	*	9.7	0.75	ug/L		04/02/19 11:58	04/03/19 21:11	1
Phenol	<9.7	*	9.7	0.81	ug/L		04/02/19 11:58	04/03/19 21:11	1
Pyrene	<9.7		9.7	0.61	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,2,4-Trichlorobenzene	<9.7	*	9.7	0.54	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4,5-Trichlorophenol	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4,6-Trichlorophenol	<9.7	*	9.7	0.83	ug/L		04/02/19 11:58	04/03/19 21:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*33*		*32 - 113*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
2-Fluorophenol	*23*	*X*	*26 - 109*	*04/02/19 11:58*	*04/03/19 21:11*	*1*

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*31*	*X*	*32 - 118*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
Phenol-d5	*18*	*X*	*27 - 110*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
Terphenyl-d14	*16*		*10 - 126*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
2,4,6-Tribromophenol	*45*		*39 - 124*	*04/02/19 11:58*	*04/03/19 21:11*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
Acenaphthylene	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 23:38	1
Acetophenone	<9.9	H	9.9	0.56	ug/L		04/09/19 15:03	04/10/19 23:38	1
Anthracene	<9.9	H	9.9	0.68	ug/L		04/09/19 15:03	04/10/19 23:38	1
Atrazine	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzaldehyde	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[a]anthracene	<9.9	H	9.9	0.54	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[a]pyrene	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[b]fluoranthene	<9.9	H	9.9	2.6	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[g,h,i]perylene	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[k]fluoranthene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,1'-Biphenyl	<9.9	H	9.9	0.57	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-chloroethoxy)methane	<9.9	H	9.9	0.93	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-chloroethyl)ether	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
bis (2-chloroisopropyl) ether	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-ethylhexyl) phthalate	<9.9	H	9.9	1.6	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Bromophenyl phenyl ether	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 23:38	1
Butyl benzyl phthalate	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
Caprolactam	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
Carbazole	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chloroaniline	<20	H	20	2.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chloro-3-methylphenol	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Chloronaphthalene	<9.9	H	9.9	0.79	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Chlorophenol	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chlorophenyl phenyl ether	<9.9	H	9.9	0.83	ug/L		04/09/19 15:03	04/10/19 23:38	1
Chrysene	<9.9	H	9.9	0.50	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dibenz(a,h)anthracene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dibenzofuran	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,2-Dichlorobenzene	<9.9	H	9.9	0.52	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,3-Dichlorobenzene	<9.9	H	9.9	0.58	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,4-Dichlorobenzene	<9.9	H	9.9	0.53	ug/L		04/09/19 15:03	04/10/19 23:38	1
3,3'-Dichlorobenzidine	<59	H	59	30	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dichlorophenol	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Diethyl phthalate	<9.9	H	9.9	0.87	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dimethylphenol	<9.9	H	9.9	3.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dimethyl phthalate	<9.9	H	9.9	0.98	ug/L		04/09/19 15:03	04/10/19 23:38	1
Di-n-butyl phthalate	<9.9	H	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 23:38	1
4,6-Dinitro-2-methylphenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dinitrophenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dinitrotoluene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,6-Dinitrotoluene	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Di-n-octyl phthalate	<9.9	H	9.9	1.4	ug/L		04/09/19 15:03	04/10/19 23:38	1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.9	H	9.9	0.73	ug/L		04/09/19 15:03	04/10/19 23:38	1
Fluorene	<9.9	H	9.9	0.95	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorobenzene	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorobutadiene	<9.9	H	9.9	0.61	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorocyclopentadiene	<9.9	H	9.9	2.5	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachloroethane	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
Indeno[1,2,3-cd]pyrene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
Isophorone	<9.9	H	9.9	0.89	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Methylnaphthalene	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Methylphenol	<9.9	H	9.9	0.88	ug/L		04/09/19 15:03	04/10/19 23:38	1
3 & 4 Methylphenol	<9.9	H	9.9	1.3	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 23:38	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
Nitrobenzene	<9.9	H	9.9	0.72	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Nitrophenol	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
N-Nitrosodi-n-propylamine	<9.9	H	9.9	0.71	ug/L		04/09/19 15:03	04/10/19 23:38	1
N-Nitrosodiphenylamine	<9.9	H	9.9	0.91	ug/L		04/09/19 15:03	04/10/19 23:38	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 23:38	1
Phenanthrene	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 23:38	1
Phenol	<9.9	H	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 23:38	1
Pyrene	<9.9	H	9.9	0.62	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,2,4-Trichlorobenzene	<9.9	H	9.9	0.55	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4,5-Trichlorophenol	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4,6-Trichlorophenol	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*60*		*32 - 113*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Nitrobenzene-d5	*59*		*32 - 118*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Phenol-d5	*48*		*27 - 110*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Terphenyl-d14	*11*		*10 - 126*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
2,4,6-Tribromophenol	*72*		*39 - 124*	*04/09/19 15:03*	*04/10/19 23:38*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.83**	**J**	1.0	0.31	ug/L			04/11/19 02:40	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**58**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:37	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:37	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:37	1
Barium	**36**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:37	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:37	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:37	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:37	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:37	1
Iron	**160**		50	17	ug/L		04/04/19 13:37	04/10/19 21:37	1
Lead	**5.3**	**J**	10	3.9	ug/L		04/04/19 13:37	04/10/19 21:37	1
Magnesium	**8200**		500	33	ug/L		04/04/19 13:37	04/10/19 21:37	1
Manganese	**31**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Nickel	**3.1**	**J**	40	2.1	ug/L		04/04/19 13:37	04/10/19 21:37	1
Potassium	**2100**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:37	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:37	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:37	1
Sodium	**15000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:37	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Vanadium	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:37	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.084**	**J B**	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:29	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: EB-03 (032719)
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14		10	7.0	ug/L			04/10/19 02:04	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 02:04	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/10/19 02:04	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 02:04	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 02:04	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 02:04	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
2-Chloroethyl vinyl ether	<10	*	10	5.0	ug/L			04/10/19 02:04	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 02:04	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 02:04	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 02:04	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 02:04	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 02:04	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 02:04	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 02:04	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 02:04	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 02:04	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 02:04	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 02:04	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 02:04	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 02:04	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 02:04	1
2,2-Dichloropropane	<1.0	*	1.0	0.37	ug/L			04/10/19 02:04	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 02:04	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Hexachlorobutadiene	<5.0	*	5.0	2.5	ug/L			04/10/19 02:04	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 02:04	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 02:04	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 02:04	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:04	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 02:04	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 02:04	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 02:04	1

Client Sample ID: EB-03 (032719)
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 02:04	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 02:04	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 02:04	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:04	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 02:04	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 02:04	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/10/19 02:04*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*		*04/10/19 02:04*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/10/19 02:04*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 02:04*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	*	0.40	0.17	ug/L		04/03/19 09:50	04/04/19 00:04	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/04/19 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*98*		*38 - 125*	*04/03/19 09:50*	*04/04/19 00:04*	*1*
Terphenyl-d14	*89*		*70 - 130*	*04/03/19 09:50*	*04/04/19 00:04*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/11/19 04:35	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: Trip Blank
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 01:18	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 01:18	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/10/19 01:18	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 01:18	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 01:18	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 01:18	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
2-Chloroethyl vinyl ether	<10	*	10	5.0	ug/L			04/10/19 01:18	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 01:18	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 01:18	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 01:18	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 01:18	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 01:18	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 01:18	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 01:18	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 01:18	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 01:18	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 01:18	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 01:18	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 01:18	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 01:18	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 01:18	1
2,2-Dichloropropane	<1.0	*	1.0	0.37	ug/L			04/10/19 01:18	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 01:18	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Hexachlorobutadiene	<5.0	*	5.0	2.5	ug/L			04/10/19 01:18	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 01:18	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 01:18	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 01:18	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 01:18	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 01:18	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 01:18	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 01:18	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: Trip Blank
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 01:18	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 01:18	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 01:18	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 01:18	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 01:18	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 01:18	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 01:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/10/19 01:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/10/19 01:18*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/10/19 01:18*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 01:18*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-166627-1	SW7B (032719)	106	85	94	97
680-166627-2	SW6D (032719)	108	90	95	99
680-166627-3	PW6D (032719)	103	83	93	96
680-166627-4	SW6C (032719)	105	84	93	96
680-166627-5	PW6C (032719)	104	83	94	100
680-166627-5 - DL	PW6C (032719)	98	98	105	95
680-166627-6	SW6B (032719)	104	84	93	96
680-166627-7	PW2B (032719)	103	84	95	96
680-166627-8	SW2B (032719)	104	84	94	89
680-166627-9	SW1C (032719)	105	96	99	104
680-166627-10	DUP06 (032719)	104	93	101	105
680-166627-11	EB-03 (032719)	104	97	101	105
680-166627-12	Trip Blank	106	96	100	105
LCS 680-565538/4	Lab Control Sample	100	95	98	100
LCS 680-565539/4	Lab Control Sample	99	84	95	89
LCS 680-565669/7	Lab Control Sample	106	101	104	104
LCS 680-565693/3	Lab Control Sample	98	91	95	94
LCSD 680-565538/5	Lab Control Sample Dup	101	94	98	101
LCSD 680-565539/5	Lab Control Sample Dup	100	81	93	92
LCSD 680-565669/31	Lab Control Sample Dup	104	98	103	104
LCSD 680-565693/4	Lab Control Sample Dup	98	87	93	95
MB 680-565538/8	Method Blank	105	94	99	104
MB 680-565539/8	Method Blank	102	83	93	98
MB 680-565669/10	Method Blank	105	94	98	104
MB 680-565693/9	Method Blank	99	95	99	94

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(32-113)	(26-109)	(32-118)	(27-110)	(10-126)	(39-124)
680-166627-7	PW2B (032719)	62	52	62	54	42	79
680-166627-7 MS	PW2B (032719)	27 X	18 X	26 X	14 X	24	36 X
680-166627-7 MSD	PW2B (032719)	36	16 X	24 X	14 X	26	52
680-166627-8	SW2B (032719)	62	52	64	55	24	73
680-166627-8 - RE	SW2B (032719)	60	48	61	46	13	76
680-166627-9	SW1C (032719)	58	47	56	50	43	74
680-166627-9 - RE	SW1C (032719)	63	51	64	50	15	74
680-166627-10	DUP06 (032719)	33	23 X	31 X	18 X	16	45
680-166627-10 - RE	DUP06 (032719)	60	52	59	48	11	72
LCS 680-564685/9-A	Lab Control Sample	20 X	14 X	17 X	9 X	51	38 X
LCS 680-565543/7-A	Lab Control Sample	58	51	63	51	57	88
LCSD 680-565543/8-A	Lab Control Sample Dup	58	51	60	53	62	74

Client: ARCADIS U.S., Inc.
Job ID: 680-166627-1
Project/Site: ATK Orbital Elkton

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		FBP	2FP	NBZ	PHL	TPHL	TBP		
Lab Sample ID	Client Sample ID	(32-113)	(26-109)	(32-118)	(27-110)	(10-126)	(39-124)		
MB 680-564685/8-A	Method Blank	26 X	16 X	25 X	10 X	55	36 X		
MB 680-565543/6-A	Method Blank	35	55	60	58	60	82		

Surrogate Legend

FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol
NBZ = Nitrobenzene-d5
PHL = Phenol-d5
TPHL = Terphenyl-d14
TBP = 2,4,6-Tribromophenol

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		NBZ	TPHL						
Lab Sample ID	Client Sample ID	(38-125)	(70-130)						
680-166627-1	SW7B (032719)	96	88						
680-166627-2	SW6D (032719)	107	98						
680-166627-3	PW6D (032719)	106	97						
680-166627-4	SW6C (032719)	100	90						
680-166627-5	PW6C (032719)	107	95						
680-166627-6	SW6B (032719)	100	92						
680-166627-11	EB-03 (032719)	98	89						
LCS 460-600045/2-A	Lab Control Sample	92	82						
LCSD 460-600045/3-A	Lab Control Sample Dup	92	84						
MB 460-600045/1-A	Method Blank	91	76						

Surrogate Legend

NBZ = Nitrobenzene-d5
TPHL = Terphenyl-d14

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-565538/8
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 11:45	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 11:45	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 11:45	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 11:45	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 11:45	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 11:45	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 11:45	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 11:45	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 11:45	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 11:45	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 11:45	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 11:45	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 11:45	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 11:45	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 11:45	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 11:45	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 11:45	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 11:45	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 11:45	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 11:45	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 11:45	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 11:45	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 11:45	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 11:45	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 11:45	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 11:45	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 11:45	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 11:45	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 11:45	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 11:45	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 11:45	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 11:45	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 11:45	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 11:45	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 11:45	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 11:45	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 11:45	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 11:45	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 11:45	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:45	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 11:45	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 11:45	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 11:45	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 11:45	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565538/8
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 11:45	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 11:45	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:45	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 11:45	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 11:45	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 11:45	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 11:45	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 11:45	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:45	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:45	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 11:45	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 11:45	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 11:45	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 11:45	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:45	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 11:45	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 11:45	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 11:45	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 11:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/09/19 11:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/09/19 11:45*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/09/19 11:45*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/09/19 11:45*	*1*

Lab Sample ID: LCS 680-565538/4
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	260		ug/L		104	70 - 135
Benzene	50.0	48.5		ug/L		97	80 - 120
Bromobenzene	50.0	49.9		ug/L		100	80 - 121
Bromochloromethane	50.0	50.6		ug/L		101	80 - 120
Bromodichloromethane	50.0	46.8		ug/L		94	80 - 120
Bromoform	50.0	48.2		ug/L		96	74 - 126
Bromomethane	50.0	49.2		ug/L		98	62 - 130
2-Butanone	250	250		ug/L		100	80 - 131
Carbon disulfide	50.0	47.3		ug/L		95	80 - 120
Carbon tetrachloride	50.0	50.1		ug/L		100	76 - 123
Chlorobenzene	50.0	49.2		ug/L		98	80 - 120
Chloroethane	50.0	43.5		ug/L		87	66 - 135
2-Chloroethyl vinyl ether	50.0	35.8		ug/L		72	71 - 135
Chloroform	50.0	47.9		ug/L		96	80 - 120
Chloromethane	50.0	47.9		ug/L		96	69 - 131
2-Chlorotoluene	50.0	50.0		ug/L		100	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565538/4
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	50.0	50.7		ug/L		101	80 - 120
cis-1,2-Dichloroethene	50.0	50.0		ug/L		100	80 - 120
cis-1,3-Dichloropropene	50.0	50.3		ug/L		101	80 - 120
Dibromochloromethane	50.0	49.7		ug/L		99	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	46.9		ug/L		94	71 - 134
1,2-Dibromoethane	50.0	48.2		ug/L		96	80 - 120
Dibromomethane	50.0	46.7		ug/L		93	80 - 120
1,2-Dichlorobenzene	50.0	48.7		ug/L		97	80 - 120
1,3-Dichlorobenzene	50.0	48.4		ug/L		97	80 - 120
1,4-Dichlorobenzene	50.0	47.1		ug/L		94	80 - 120
Dichlorodifluoromethane	50.0	44.5		ug/L		89	47 - 155
1,1-Dichloroethane	50.0	48.2		ug/L		96	80 - 120
1,2-Dichloroethane	50.0	48.0		ug/L		96	80 - 120
1,1-Dichloroethene	50.0	46.7		ug/L		93	76 - 120
1,2-Dichloroethene, Total	100	98.4		ug/L		98	80 - 120
1,2-Dichloropropane	50.0	48.0		ug/L		96	80 - 120
1,3-Dichloropropane	50.0	47.4		ug/L		95	80 - 120
2,2-Dichloropropane	50.0	55.7		ug/L		111	76 - 126
1,1-Dichloropropene	50.0	48.7		ug/L		97	80 - 120
Ethylbenzene	50.0	50.1		ug/L		100	80 - 120
Hexachlorobutadiene	50.0	51.2		ug/L		102	60 - 140
2-Hexanone	250	242		ug/L		97	74 - 127
Isopropylbenzene	50.0	51.3		ug/L		103	80 - 120
Methylene Chloride	50.0	45.2		ug/L		90	80 - 120
4-Methyl-2-pentanone	250	245		ug/L		98	76 - 124
Methyl tert-butyl ether	50.0	47.1		ug/L		94	80 - 120
m-Xylene & p-Xylene	50.0	50.9		ug/L		102	80 - 120
n-Butylbenzene	50.0	51.4		ug/L		103	80 - 120
N-Propylbenzene	50.0	51.3		ug/L		103	80 - 120
o-Xylene	50.0	51.4		ug/L		103	80 - 120
p-Isopropyltoluene	50.0	52.2		ug/L		104	80 - 120
sec-Butylbenzene	50.0	51.1		ug/L		102	80 - 120
Styrene	50.0	52.2		ug/L		104	80 - 120
tert-Butylbenzene	50.0	51.2		ug/L		102	80 - 121
1,1,1,2-Tetrachloroethane	50.0	49.1		ug/L		98	80 - 121
1,1,2,2-Tetrachloroethane	50.0	48.5		ug/L		97	80 - 120
Tetrachloroethene	50.0	47.0		ug/L		94	80 - 121
Toluene	50.0	49.2		ug/L		98	80 - 113
trans-1,2-Dichloroethene	50.0	48.3		ug/L		97	80 - 120
trans-1,3-Dichloropropene	50.0	50.4		ug/L		101	80 - 120
1,2,3-Trichlorobenzene	50.0	49.6		ug/L		99	61 - 141
1,2,4-Trichlorobenzene	50.0	50.9		ug/L		102	68 - 128
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	80 - 120
1,1,2-Trichloroethane	50.0	47.7		ug/L		95	80 - 120
Trichloroethene	50.0	48.1		ug/L		96	80 - 120
Trichlorofluoromethane	50.0	48.0		ug/L		96	60 - 141
1,2,3-Trichloropropane	50.0	47.7		ug/L		95	80 - 123
1,2,4-Trimethylbenzene	50.0	51.9		ug/L		104	80 - 120
1,3,5-Trimethylbenzene	50.0	51.1		ug/L		102	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565538/4
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl acetate	100	115		ug/L		115	67 - 135
Vinyl chloride	50.0	46.6		ug/L		93	71 - 128
Xylenes, Total	100	102		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*

Lab Sample ID: LCSD 680-565538/5
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	260		ug/L		104	70 - 135	0	30
Benzene	50.0	49.0		ug/L		98	80 - 120	1	20
Bromobenzene	50.0	50.8		ug/L		102	80 - 121	2	20
Bromochloromethane	50.0	50.3		ug/L		101	80 - 120	1	20
Bromodichloromethane	50.0	47.4		ug/L		95	80 - 120	1	20
Bromoform	50.0	49.2		ug/L		98	74 - 126	2	20
Bromomethane	50.0	53.7		ug/L		107	62 - 130	9	20
2-Butanone	250	250		ug/L		100	80 - 131	0	20
Carbon disulfide	50.0	48.6		ug/L		97	80 - 120	3	20
Carbon tetrachloride	50.0	50.2		ug/L		100	76 - 123	0	20
Chlorobenzene	50.0	50.1		ug/L		100	80 - 120	2	20
Chloroethane	50.0	43.8		ug/L		88	66 - 135	1	20
2-Chloroethyl vinyl ether	50.0	36.9		ug/L		74	71 - 135	3	50
Chloroform	50.0	48.7		ug/L		97	80 - 120	2	20
Chloromethane	50.0	47.5		ug/L		95	69 - 131	1	30
2-Chlorotoluene	50.0	51.3		ug/L		103	80 - 120	2	20
4-Chlorotoluene	50.0	51.8		ug/L		104	80 - 120	2	20
cis-1,2-Dichloroethene	50.0	50.0		ug/L		100	80 - 120	0	20
cis-1,3-Dichloropropene	50.0	49.9		ug/L		100	80 - 120	1	20
Dibromochloromethane	50.0	49.2		ug/L		98	80 - 121	1	20
1,2-Dibromo-3-Chloropropane	50.0	45.9		ug/L		92	71 - 134	2	20
1,2-Dibromoethane	50.0	48.1		ug/L		96	80 - 120	0	20
Dibromomethane	50.0	47.2		ug/L		94	80 - 120	1	20
1,2-Dichlorobenzene	50.0	48.4		ug/L		97	80 - 120	1	20
1,3-Dichlorobenzene	50.0	49.5		ug/L		99	80 - 120	2	20
1,4-Dichlorobenzene	50.0	48.4		ug/L		97	80 - 120	3	20
Dichlorodifluoromethane	50.0	45.7		ug/L		91	47 - 155	3	40
1,1-Dichloroethane	50.0	48.3		ug/L		97	80 - 120	0	20
1,2-Dichloroethane	50.0	48.2		ug/L		96	80 - 120	0	50
1,1-Dichloroethene	50.0	47.7		ug/L		95	76 - 120	2	20
1,2-Dichloroethene, Total	100	98.9		ug/L		99	80 - 120	1	20
1,2-Dichloropropane	50.0	48.1		ug/L		96	80 - 120	0	20
1,3-Dichloropropane	50.0	46.9		ug/L		94	80 - 120	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565538/5
Matrix: Water
Analysis Batch: 565538

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,2-Dichloropropane	50.0	57.2		ug/L		114	76 - 126	3	20
1,1-Dichloropropene	50.0	50.2		ug/L		100	80 - 120	3	20
Ethylbenzene	50.0	51.1		ug/L		102	80 - 120	2	20
Hexachlorobutadiene	50.0	53.0		ug/L		106	60 - 140	3	20
2-Hexanone	250	240		ug/L		96	74 - 127	1	20
Isopropylbenzene	50.0	52.5		ug/L		105	80 - 120	2	20
Methylene Chloride	50.0	45.0		ug/L		90	80 - 120	0	20
4-Methyl-2-pentanone	250	242		ug/L		97	76 - 124	1	20
Methyl tert-butyl ether	50.0	47.8		ug/L		96	80 - 120	1	20
m-Xylene & p-Xylene	50.0	51.9		ug/L		104	80 - 120	2	20
n-Butylbenzene	50.0	52.5		ug/L		105	80 - 120	2	20
N-Propylbenzene	50.0	52.9		ug/L		106	80 - 120	3	20
o-Xylene	50.0	52.0		ug/L		104	80 - 120	1	30
p-Isopropyltoluene	50.0	53.8		ug/L		108	80 - 120	3	20
sec-Butylbenzene	50.0	51.8		ug/L		104	80 - 120	1	20
Styrene	50.0	53.3		ug/L		107	80 - 120	2	20
tert-Butylbenzene	50.0	53.1		ug/L		106	80 - 121	4	20
1,1,1,2-Tetrachloroethane	50.0	49.9		ug/L		100	80 - 121	1	20
1,1,2,2-Tetrachloroethane	50.0	48.0		ug/L		96	80 - 120	1	20
Tetrachloroethene	50.0	48.5		ug/L		97	80 - 121	3	20
Toluene	50.0	49.9		ug/L		100	80 - 113	1	20
trans-1,2-Dichloroethene	50.0	48.9		ug/L		98	80 - 120	1	20
trans-1,3-Dichloropropene	50.0	50.2		ug/L		100	80 - 120	0	30
1,2,3-Trichlorobenzene	50.0	50.2		ug/L		100	61 - 141	1	20
1,2,4-Trichlorobenzene	50.0	51.7		ug/L		103	68 - 128	2	20
1,1,1-Trichloroethane	50.0	50.0		ug/L		100	80 - 120	1	20
1,1,2-Trichloroethane	50.0	47.0		ug/L		94	80 - 120	2	20
Trichloroethene	50.0	49.4		ug/L		99	80 - 120	3	20
Trichlorofluoromethane	50.0	49.7		ug/L		99	60 - 141	4	20
1,2,3-Trichloropropane	50.0	48.0		ug/L		96	80 - 123	1	30
1,2,4-Trimethylbenzene	50.0	52.6		ug/L		105	80 - 120	1	20
1,3,5-Trimethylbenzene	50.0	52.4		ug/L		105	80 - 120	2	20
Vinyl acetate	100	114		ug/L		114	67 - 135	1	20
Vinyl chloride	50.0	48.1		ug/L		96	71 - 128	3	20
Xylenes, Total	100	104		ug/L		104	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 11:35	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 11:35	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 11:35	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 11:35	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 11:35	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/09/19 11:35	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 11:35	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 11:35	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 11:35	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 11:35	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 11:35	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 11:35	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 11:35	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 11:35	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 11:35	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 11:35	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 11:35	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 11:35	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 11:35	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 11:35	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 11:35	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 11:35	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 11:35	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 11:35	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 11:35	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 11:35	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:35	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 11:35	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 11:35	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 11:35	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 11:35	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565539/8
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 11:35	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 11:35	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 11:35	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 11:35	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 11:35	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 11:35	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 11:35	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 11:35	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 11:35	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 11:35	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 11:35	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 11:35	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 11:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*04/09/19 11:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 11:35*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 11:35*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/09/19 11:35*	*1*

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	261		ug/L		104	70 - 135
Benzene	50.0	48.7		ug/L		97	80 - 120
Bromobenzene	50.0	51.0		ug/L		102	80 - 121
Bromochloromethane	50.0	48.0		ug/L		96	80 - 120
Bromodichloromethane	50.0	46.7		ug/L		93	80 - 120
Bromoform	50.0	51.3		ug/L		103	74 - 126
Bromomethane	50.0	67.1	*	ug/L		134	62 - 130
2-Butanone	250	257		ug/L		103	80 - 131
Carbon disulfide	50.0	47.1		ug/L		94	80 - 120
Carbon tetrachloride	50.0	49.0		ug/L		98	76 - 123
Chlorobenzene	50.0	50.1		ug/L		100	80 - 120
Chloroethane	50.0	60.0		ug/L		120	66 - 135
2-Chloroethyl vinyl ether	50.0	46.2		ug/L		92	71 - 135
Chloroform	50.0	46.4		ug/L		93	80 - 120
Chloromethane	50.0	56.1		ug/L		112	69 - 131
2-Chlorotoluene	50.0	49.1		ug/L		98	80 - 120
4-Chlorotoluene	50.0	49.4		ug/L		99	80 - 120
cis-1,2-Dichloroethene	50.0	48.2		ug/L		96	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,3-Dichloropropene	50.0	49.5		ug/L		99	80 - 120
Dibromochloromethane	50.0	49.5		ug/L		99	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	50.4		ug/L		101	71 - 134
1,2-Dibromoethane	50.0	47.6		ug/L		95	80 - 120
Dibromomethane	50.0	47.7		ug/L		95	80 - 120
1,2-Dichlorobenzene	50.0	47.4		ug/L		95	80 - 120
1,3-Dichlorobenzene	50.0	47.0		ug/L		94	80 - 120
1,4-Dichlorobenzene	50.0	46.7		ug/L		93	80 - 120
Dichlorodifluoromethane	50.0	49.6		ug/L		99	47 - 155
1,1-Dichloroethane	50.0	48.9		ug/L		98	80 - 120
1,2-Dichloroethane	50.0	41.9		ug/L		84	80 - 120
1,1-Dichloroethene	50.0	52.7		ug/L		105	76 - 120
1,2-Dichloroethene, Total	100	96.6		ug/L		97	80 - 120
1,2-Dichloropropane	50.0	50.1		ug/L		100	80 - 120
1,3-Dichloropropane	50.0	47.9		ug/L		96	80 - 120
2,2-Dichloropropane	50.0	50.1		ug/L		100	76 - 126
1,1-Dichloropropene	50.0	48.6		ug/L		97	80 - 120
Ethylbenzene	50.0	49.6		ug/L		99	80 - 120
Hexachlorobutadiene	50.0	48.3		ug/L		97	60 - 140
2-Hexanone	250	240		ug/L		96	74 - 127
Isopropylbenzene	50.0	50.3		ug/L		101	80 - 120
Methylene Chloride	50.0	46.7		ug/L		93	80 - 120
4-Methyl-2-pentanone	250	235		ug/L		94	76 - 124
Methyl tert-butyl ether	50.0	46.3		ug/L		93	80 - 120
m-Xylene & p-Xylene	50.0	49.6		ug/L		99	80 - 120
n-Butylbenzene	50.0	48.1		ug/L		96	80 - 120
N-Propylbenzene	50.0	50.1		ug/L		100	80 - 120
o-Xylene	50.0	49.5		ug/L		99	80 - 120
p-Isopropyltoluene	50.0	48.8		ug/L		98	80 - 120
sec-Butylbenzene	50.0	50.7		ug/L		101	80 - 120
Styrene	50.0	50.1		ug/L		100	80 - 120
tert-Butylbenzene	50.0	51.4		ug/L		103	80 - 121
1,1,1,2-Tetrachloroethane	50.0	50.4		ug/L		101	80 - 121
1,1,2,2-Tetrachloroethane	50.0	49.2		ug/L		98	80 - 120
Tetrachloroethene	50.0	51.9		ug/L		104	80 - 121
Toluene	50.0	49.2		ug/L		98	80 - 113
trans-1,2-Dichloroethene	50.0	48.4		ug/L		97	80 - 120
trans-1,3-Dichloropropene	50.0	48.1		ug/L		96	80 - 120
1,2,3-Trichlorobenzene	50.0	46.8		ug/L		94	61 - 141
1,2,4-Trichlorobenzene	50.0	47.4		ug/L		95	68 - 128
1,1,1-Trichloroethane	50.0	47.3		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	48.5		ug/L		97	80 - 120
Trichloroethene	50.0	49.9		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	58.5		ug/L		117	60 - 141
1,2,3-Trichloropropane	50.0	49.4		ug/L		99	80 - 123
1,2,4-Trimethylbenzene	50.0	50.4		ug/L		101	80 - 120
1,3,5-Trimethylbenzene	50.0	50.5		ug/L		101	80 - 120
Vinyl acetate	100	108		ug/L		108	67 - 135
Vinyl chloride	50.0	58.1		ug/L		116	71 - 128

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565539/4
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Xylenes, Total			100	99.1		ug/L		99	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*
Dibromofluoromethane (Surr)	*95*		*80 - 122*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*

Lab Sample ID: LCSD 680-565539/5
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	278		ug/L		111	70 - 135	6	30
Benzene			50.0	48.7		ug/L		97	80 - 120	0	20
Bromobenzene			50.0	50.8		ug/L		102	80 - 121	0	20
Bromochloromethane			50.0	46.6		ug/L		93	80 - 120	3	20
Bromodichloromethane			50.0	45.9		ug/L		92	80 - 120	2	20
Bromoform			50.0	51.0		ug/L		102	74 - 126	1	20
Bromomethane			50.0	68.0	*	ug/L		136	62 - 130	1	20
2-Butanone			250	251		ug/L		100	80 - 131	2	20
Carbon disulfide			50.0	53.1		ug/L		106	80 - 120	12	20
Carbon tetrachloride			50.0	49.7		ug/L		99	76 - 123	2	20
Chlorobenzene			50.0	50.4		ug/L		101	80 - 120	1	20
Chloroethane			50.0	60.1		ug/L		120	66 - 135	0	20
2-Chloroethyl vinyl ether			50.0	45.9		ug/L		92	71 - 135	1	50
Chloroform			50.0	46.1		ug/L		92	80 - 120	1	20
Chloromethane			50.0	55.9		ug/L		112	69 - 131	0	30
2-Chlorotoluene			50.0	49.7		ug/L		99	80 - 120	1	20
4-Chlorotoluene			50.0	49.3		ug/L		99	80 - 120	0	20
cis-1,2-Dichloroethene			50.0	48.1		ug/L		96	80 - 120	0	20
cis-1,3-Dichloropropene			50.0	48.5		ug/L		97	80 - 120	2	20
Dibromochloromethane			50.0	48.8		ug/L		98	80 - 121	1	20
1,2-Dibromo-3-Chloropropane			50.0	50.2		ug/L		100	71 - 134	0	20
1,2-Dibromoethane			50.0	45.9		ug/L		92	80 - 120	4	20
Dibromomethane			50.0	46.4		ug/L		93	80 - 120	3	20
1,2-Dichlorobenzene			50.0	48.1		ug/L		96	80 - 120	1	20
1,3-Dichlorobenzene			50.0	48.3		ug/L		97	80 - 120	3	20
1,4-Dichlorobenzene			50.0	47.0		ug/L		94	80 - 120	1	20
Dichlorodifluoromethane			50.0	51.1		ug/L		102	47 - 155	3	40
1,1-Dichloroethane			50.0	51.2		ug/L		102	80 - 120	5	20
1,2-Dichloroethane			50.0	41.7		ug/L		83	80 - 120	1	50
1,1-Dichloroethene			50.0	60.4	*	ug/L		121	76 - 120	14	20
1,2-Dichloroethene, Total			100	103		ug/L		103	80 - 120	7	20
1,2-Dichloropropane			50.0	49.7		ug/L		99	80 - 120	1	20
1,3-Dichloropropane			50.0	46.7		ug/L		93	80 - 120	2	20
2,2-Dichloropropane			50.0	50.1		ug/L		100	76 - 126	0	20
1,1-Dichloropropene			50.0	48.4		ug/L		97	80 - 120	0	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565539/5
Matrix: Water
Analysis Batch: 565539

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene	50.0	50.4		ug/L		101	80 - 120	2	20
Hexachlorobutadiene	50.0	49.4		ug/L		99	60 - 140	2	20
2-Hexanone	250	231		ug/L		92	74 - 127	4	20
Isopropylbenzene	50.0	51.0		ug/L		102	80 - 120	1	20
Methylene Chloride	50.0	51.7		ug/L		103	80 - 120	10	20
4-Methyl-2-pentanone	250	227		ug/L		91	76 - 124	4	20
Methyl tert-butyl ether	50.0	51.2		ug/L		102	80 - 120	10	20
m-Xylene & p-Xylene	50.0	50.5		ug/L		101	80 - 120	2	20
n-Butylbenzene	50.0	49.1		ug/L		98	80 - 120	2	20
N-Propylbenzene	50.0	50.8		ug/L		102	80 - 120	1	20
o-Xylene	50.0	49.8		ug/L		100	80 - 120	1	30
p-Isopropyltoluene	50.0	50.3		ug/L		101	80 - 120	3	20
sec-Butylbenzene	50.0	51.6		ug/L		103	80 - 120	2	20
Styrene	50.0	50.0		ug/L		100	80 - 120	0	20
tert-Butylbenzene	50.0	51.4		ug/L		103	80 - 121	0	20
1,1,1,2-Tetrachloroethane	50.0	50.3		ug/L		101	80 - 121	0	20
1,1,2,2-Tetrachloroethane	50.0	48.8		ug/L		98	80 - 120	1	20
Tetrachloroethene	50.0	52.1		ug/L		104	80 - 121	0	20
Toluene	50.0	49.0		ug/L		98	80 - 113	0	20
trans-1,2-Dichloroethene	50.0	55.0		ug/L		110	80 - 120	13	20
trans-1,3-Dichloropropene	50.0	47.3		ug/L		95	80 - 120	2	30
1,2,3-Trichlorobenzene	50.0	46.8		ug/L		94	61 - 141	0	20
1,2,4-Trichlorobenzene	50.0	48.1		ug/L		96	68 - 128	1	20
1,1,1-Trichloroethane	50.0	47.1		ug/L		94	80 - 120	0	20
1,1,2-Trichloroethane	50.0	48.3		ug/L		97	80 - 120	0	20
Trichloroethene	50.0	49.7		ug/L		99	80 - 120	0	20
Trichlorofluoromethane	50.0	60.4		ug/L		121	60 - 141	3	20
1,2,3-Trichloropropane	50.0	49.3		ug/L		99	80 - 123	0	30
1,2,4-Trimethylbenzene	50.0	51.1		ug/L		102	80 - 120	1	20
1,3,5-Trimethylbenzene	50.0	51.3		ug/L		103	80 - 120	2	20
Vinyl acetate	100	111		ug/L		111	67 - 135	3	20
Vinyl chloride	50.0	58.9		ug/L		118	71 - 128	1	20
Xylenes, Total	100	100		ug/L		100	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*81*		*73 - 131*
Dibromofluoromethane (Surr)	*93*		*80 - 122*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*

Lab Sample ID: MB 680-565669/10
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 00:08	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 00:08	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 00:08	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565669/10
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 00:08	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 00:08	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 00:08	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 00:08	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 00:08	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 00:08	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 00:08	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/10/19 00:08	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 00:08	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 00:08	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 00:08	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 00:08	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 00:08	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 00:08	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 00:08	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 00:08	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 00:08	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 00:08	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 00:08	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 00:08	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 00:08	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 00:08	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 00:08	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 00:08	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 00:08	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 00:08	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 00:08	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 00:08	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/10/19 00:08	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 00:08	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 00:08	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 00:08	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 00:08	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 00:08	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 00:08	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 00:08	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 00:08	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 00:08	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 00:08	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 00:08	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 00:08	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 00:08	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 00:08	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 00:08	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 00:08	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565669/10
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 00:08	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 00:08	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 00:08	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 00:08	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 00:08	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 00:08	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 00:08	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 00:08	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 00:08	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 00:08	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 00:08	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 00:08	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/10/19 00:08	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 00:08	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 00:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/10/19 00:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*04/10/19 00:08*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*04/10/19 00:08*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/10/19 00:08*	*1*

Lab Sample ID: LCS 680-565669/7
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	256		ug/L		102	70 - 135
Benzene	50.0	51.4		ug/L		103	80 - 120
Bromobenzene	50.0	52.2		ug/L		104	80 - 121
Bromochloromethane	50.0	53.6		ug/L		107	80 - 120
Bromodichloromethane	50.0	48.9		ug/L		98	80 - 120
Bromoform	50.0	52.1		ug/L		104	74 - 126
Bromomethane	50.0	55.2		ug/L		110	62 - 130
2-Butanone	250	250		ug/L		100	80 - 131
Carbon disulfide	50.0	51.8		ug/L		104	80 - 120
Carbon tetrachloride	50.0	53.8		ug/L		108	76 - 123
Chlorobenzene	50.0	52.0		ug/L		104	80 - 120
Chloroethane	50.0	44.5		ug/L		89	66 - 135
2-Chloroethyl vinyl ether	50.0	33.2	*	ug/L		66	71 - 135
Chloroform	50.0	51.5		ug/L		103	80 - 120
Chloromethane	50.0	49.5		ug/L		99	69 - 131
2-Chlorotoluene	50.0	52.9		ug/L		106	80 - 120
4-Chlorotoluene	50.0	53.6		ug/L		107	80 - 120
cis-1,2-Dichloroethene	50.0	52.5		ug/L		105	80 - 120
cis-1,3-Dichloropropene	50.0	50.6		ug/L		101	80 - 120
Dibromochloromethane	50.0	51.1		ug/L		102	80 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565669/7
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromo-3-Chloropropane	50.0	49.2		ug/L		98	71 - 134
1,2-Dibromoethane	50.0	49.7		ug/L		99	80 - 120
Dibromomethane	50.0	49.5		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	50.3		ug/L		101	80 - 120
1,3-Dichlorobenzene	50.0	50.5		ug/L		101	80 - 120
1,4-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120
Dichlorodifluoromethane	50.0	46.8		ug/L		94	47 - 155
1,1-Dichloroethane	50.0	51.9		ug/L		104	80 - 120
1,2-Dichloroethane	50.0	50.8		ug/L		102	80 - 120
1,1-Dichloroethene	50.0	48.8		ug/L		98	76 - 120
1,2-Dichloroethene, Total	100	104		ug/L		104	80 - 120
1,2-Dichloropropane	50.0	50.3		ug/L		101	80 - 120
1,3-Dichloropropane	50.0	48.4		ug/L		97	80 - 120
2,2-Dichloropropane	50.0	50.3		ug/L		101	76 - 126
1,1-Dichloropropene	50.0	52.4		ug/L		105	80 - 120
Ethylbenzene	50.0	53.0		ug/L		106	80 - 120
Hexachlorobutadiene	50.0	53.4		ug/L		107	60 - 140
2-Hexanone	250	244		ug/L		98	74 - 127
Isopropylbenzene	50.0	54.8		ug/L		110	80 - 120
Methylene Chloride	50.0	48.0		ug/L		96	80 - 120
4-Methyl-2-pentanone	250	253		ug/L		101	76 - 124
Methyl tert-butyl ether	50.0	50.5		ug/L		101	80 - 120
m-Xylene & p-Xylene	50.0	53.3		ug/L		107	80 - 120
n-Butylbenzene	50.0	52.1		ug/L		104	80 - 120
N-Propylbenzene	50.0	53.9		ug/L		108	80 - 120
o-Xylene	50.0	54.0		ug/L		108	80 - 120
p-Isopropyltoluene	50.0	54.0		ug/L		108	80 - 120
sec-Butylbenzene	50.0	52.8		ug/L		106	80 - 120
Styrene	50.0	55.2		ug/L		110	80 - 120
tert-Butylbenzene	50.0	53.9		ug/L		108	80 - 121
1,1,1,2-Tetrachloroethane	50.0	51.7		ug/L		103	80 - 121
1,1,2,2-Tetrachloroethane	50.0	50.4		ug/L		101	80 - 120
Tetrachloroethene	50.0	49.6		ug/L		99	80 - 121
Toluene	50.0	51.5		ug/L		103	80 - 113
trans-1,2-Dichloroethene	50.0	51.8		ug/L		104	80 - 120
trans-1,3-Dichloropropene	50.0	50.8		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	51.4		ug/L		103	61 - 141
1,2,4-Trichlorobenzene	50.0	52.6		ug/L		105	68 - 128
1,1,1-Trichloroethane	50.0	52.5		ug/L		105	80 - 120
1,1,2-Trichloroethane	50.0	50.4		ug/L		101	80 - 120
Trichloroethene	50.0	52.4		ug/L		105	80 - 120
Trichlorofluoromethane	50.0	51.2		ug/L		102	60 - 141
1,2,3-Trichloropropane	50.0	50.6		ug/L		101	80 - 123
1,2,4-Trimethylbenzene	50.0	54.3		ug/L		109	80 - 120
1,3,5-Trimethylbenzene	50.0	54.1		ug/L		108	80 - 120
Vinyl acetate	100	105		ug/L		105	67 - 135
Vinyl chloride	50.0	48.9		ug/L		98	71 - 128
Xylenes, Total	100	107		ug/L		107	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565669/7
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	*106*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*101*		*73 - 131*
Dibromofluoromethane (Surr)	*104*		*80 - 122*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*

Lab Sample ID: LCSD 680-565669/31
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	233		ug/L		93	70 - 135	9	30
Benzene			50.0	49.7		ug/L		99	80 - 120	3	20
Bromobenzene			50.0	51.9		ug/L		104	80 - 121	1	20
Bromochloromethane			50.0	51.9		ug/L		104	80 - 120	3	20
Bromodichloromethane			50.0	48.2		ug/L		96	80 - 120	1	20
Bromoform			50.0	51.5		ug/L		103	74 - 126	1	20
Bromomethane			50.0	27.8	*	ug/L		56	62 - 130	66	20
2-Butanone			250	249		ug/L		100	80 - 131	0	20
Carbon disulfide			50.0	47.1		ug/L		94	80 - 120	9	20
Carbon tetrachloride			50.0	51.2		ug/L		102	76 - 123	5	20
Chlorobenzene			50.0	51.3		ug/L		103	80 - 120	1	20
Chloroethane			50.0	48.5		ug/L		97	66 - 135	9	20
2-Chloroethyl vinyl ether			50.0	39.0		ug/L		78	71 - 135	16	50
Chloroform			50.0	50.5		ug/L		101	80 - 120	2	20
Chloromethane			50.0	44.7		ug/L		89	69 - 131	10	30
2-Chlorotoluene			50.0	50.8		ug/L		102	80 - 120	4	20
4-Chlorotoluene			50.0	51.6		ug/L		103	80 - 120	4	20
cis-1,2-Dichloroethene			50.0	48.6		ug/L		97	80 - 120	8	20
cis-1,3-Dichloropropene			50.0	47.8		ug/L		96	80 - 120	6	20
Dibromochloromethane			50.0	50.5		ug/L		101	80 - 121	1	20
1,2-Dibromo-3-Chloropropane			50.0	48.2		ug/L		96	71 - 134	2	20
1,2-Dibromoethane			50.0	49.1		ug/L		98	80 - 120	1	20
Dibromomethane			50.0	48.5		ug/L		97	80 - 120	2	20
1,2-Dichlorobenzene			50.0	50.0		ug/L		100	80 - 120	1	20
1,3-Dichlorobenzene			50.0	49.2		ug/L		98	80 - 120	3	20
1,4-Dichlorobenzene			50.0	47.7		ug/L		95	80 - 120	3	20
Dichlorodifluoromethane			50.0	38.7		ug/L		77	47 - 155	19	40
1,1-Dichloroethane			50.0	49.7		ug/L		99	80 - 120	4	20
1,2-Dichloroethane			50.0	49.9		ug/L		100	80 - 120	2	50
1,1-Dichloroethene			50.0	46.9		ug/L		94	76 - 120	4	20
1,2-Dichloroethene, Total			100	97.6		ug/L		98	80 - 120	7	20
1,2-Dichloropropane			50.0	47.2		ug/L		94	80 - 120	6	20
1,3-Dichloropropane			50.0	47.8		ug/L		96	80 - 120	1	20
2,2-Dichloropropane			50.0	39.3	*	ug/L		79	76 - 126	25	20
1,1-Dichloropropene			50.0	48.3		ug/L		97	80 - 120	8	20
Ethylbenzene			50.0	52.6		ug/L		105	80 - 120	1	20
Hexachlorobutadiene			50.0	43.0	*	ug/L		86	60 - 140	21	20
2-Hexanone			250	238		ug/L		95	74 - 127	2	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565669/31
Matrix: Water
Analysis Batch: 565669

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Isopropylbenzene	50.0	52.8		ug/L		106	80 - 120	4	20
Methylene Chloride	50.0	45.7		ug/L		91	80 - 120	5	20
4-Methyl-2-pentanone	250	247		ug/L		99	76 - 124	2	20
Methyl tert-butyl ether	50.0	47.3		ug/L		95	80 - 120	7	20
m-Xylene & p-Xylene	50.0	52.6		ug/L		105	80 - 120	1	20
n-Butylbenzene	50.0	47.5		ug/L		95	80 - 120	9	20
N-Propylbenzene	50.0	52.2		ug/L		104	80 - 120	3	20
o-Xylene	50.0	52.7		ug/L		105	80 - 120	2	30
p-Isopropyltoluene	50.0	51.8		ug/L		104	80 - 120	4	20
sec-Butylbenzene	50.0	50.2		ug/L		100	80 - 120	5	20
Styrene	50.0	54.7		ug/L		109	80 - 120	1	20
tert-Butylbenzene	50.0	51.6		ug/L		103	80 - 121	4	20
1,1,1,2-Tetrachloroethane	50.0	51.8		ug/L		104	80 - 121	0	20
1,1,2,2-Tetrachloroethane	50.0	48.3		ug/L		97	80 - 120	4	20
Tetrachloroethene	50.0	46.6		ug/L		93	80 - 121	6	20
Toluene	50.0	49.5		ug/L		99	80 - 113	4	20
trans-1,2-Dichloroethene	50.0	49.0		ug/L		98	80 - 120	5	20
trans-1,3-Dichloropropene	50.0	47.4		ug/L		95	80 - 120	7	30
1,2,3-Trichlorobenzene	50.0	43.7		ug/L		87	61 - 141	16	20
1,2,4-Trichlorobenzene	50.0	47.6		ug/L		95	68 - 128	10	20
1,1,1-Trichloroethane	50.0	50.6		ug/L		101	80 - 120	4	20
1,1,2-Trichloroethane	50.0	48.5		ug/L		97	80 - 120	4	20
Trichloroethene	50.0	50.3		ug/L		101	80 - 120	4	20
Trichlorofluoromethane	50.0	46.2		ug/L		92	60 - 141	10	20
1,2,3-Trichloropropane	50.0	49.5		ug/L		99	80 - 123	2	30
1,2,4-Trimethylbenzene	50.0	53.0		ug/L		106	80 - 120	2	20
1,3,5-Trimethylbenzene	50.0	53.6		ug/L		107	80 - 120	1	20
Vinyl acetate	100	84.9	*	ug/L		85	67 - 135	21	20
Vinyl chloride	50.0	44.4		ug/L		89	71 - 128	10	20
Xylenes, Total	100	105		ug/L		105	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*
Dibromofluoromethane (Surr)	*103*		*80 - 122*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*

Lab Sample ID: MB 680-565693/9
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 10:11	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 10:11	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 10:11	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 10:11	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 10:11	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 10:11	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565693/9
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 10:11	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 10:11	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 10:11	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 10:11	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
2-Chloroethyl vinyl ether	<10		10	5.0	ug/L			04/10/19 10:11	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 10:11	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 10:11	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 10:11	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 10:11	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 10:11	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 10:11	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 10:11	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 10:11	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 10:11	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 10:11	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 10:11	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 10:11	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 10:11	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 10:11	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 10:11	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 10:11	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 10:11	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 10:11	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 10:11	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 10:11	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/10/19 10:11	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 10:11	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 10:11	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 10:11	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 10:11	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 10:11	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 10:11	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 10:11	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 10:11	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 10:11	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 10:11	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 10:11	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 10:11	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 10:11	1
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 10:11	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 10:11	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 10:11	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 10:11	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 10:11	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 10:11	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565693/9
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 10:11	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 10:11	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 10:11	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 10:11	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 10:11	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 10:11	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 10:11	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 10:11	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 10:11	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/10/19 10:11	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 10:11	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 10:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*04/10/19 10:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*04/10/19 10:11*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/10/19 10:11*	*1*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*04/10/19 10:11*	*1*

Lab Sample ID: LCS 680-565693/3
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	268		ug/L		107	70 - 135
Benzene	50.0	49.8		ug/L		100	80 - 120
Bromobenzene	50.0	50.4		ug/L		101	80 - 121
Bromochloromethane	50.0	42.7		ug/L		85	80 - 120
Bromodichloromethane	50.0	48.0		ug/L		96	80 - 120
Bromoform	50.0	43.0		ug/L		86	74 - 126
Bromomethane	50.0	22.8	*	ug/L		46	62 - 130
2-Butanone	250	250		ug/L		100	80 - 131
Carbon disulfide	50.0	52.3		ug/L		105	80 - 120
Carbon tetrachloride	50.0	41.5		ug/L		83	76 - 123
Chlorobenzene	50.0	49.5		ug/L		99	80 - 120
Chloroethane	50.0	54.6		ug/L		109	66 - 135
2-Chloroethyl vinyl ether	50.0	29.3	*	ug/L		59	71 - 135
Chloroform	50.0	50.2		ug/L		100	80 - 120
Chloromethane	50.0	80.8	*	ug/L		162	69 - 131
2-Chlorotoluene	50.0	47.4		ug/L		95	80 - 120
4-Chlorotoluene	50.0	48.6		ug/L		97	80 - 120
cis-1,2-Dichloroethene	50.0	48.8		ug/L		98	80 - 120
cis-1,3-Dichloropropene	50.0	50.9		ug/L		102	80 - 120
Dibromochloromethane	50.0	46.9		ug/L		94	80 - 121
1,2-Dibromo-3-Chloropropane	50.0	43.6		ug/L		87	71 - 134
1,2-Dibromoethane	50.0	49.2		ug/L		98	80 - 120
Dibromomethane	50.0	50.6		ug/L		101	80 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565693/3
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichlorobenzene	50.0	49.9		ug/L		100	80 - 120
1,3-Dichlorobenzene	50.0	48.5		ug/L		97	80 - 120
1,4-Dichlorobenzene	50.0	49.1		ug/L		98	80 - 120
Dichlorodifluoromethane	50.0	62.4		ug/L		125	47 - 155
1,1-Dichloroethane	50.0	47.5		ug/L		95	80 - 120
1,2-Dichloroethane	50.0	48.4		ug/L		97	80 - 120
1,1-Dichloroethene	50.0	50.6		ug/L		101	76 - 120
1,2-Dichloroethene, Total	100	95.7		ug/L		96	80 - 120
1,2-Dichloropropane	50.0	49.8		ug/L		100	80 - 120
1,3-Dichloropropane	50.0	50.9		ug/L		102	80 - 120
2,2-Dichloropropane	50.0	49.4		ug/L		99	76 - 126
1,1-Dichloropropene	50.0	50.6		ug/L		101	80 - 120
Ethylbenzene	50.0	49.7		ug/L		99	80 - 120
Hexachlorobutadiene	50.0	45.3		ug/L		91	60 - 140
2-Hexanone	250	239		ug/L		96	74 - 127
Isopropylbenzene	50.0	48.9		ug/L		98	80 - 120
Methylene Chloride	50.0	50.8		ug/L		102	80 - 120
4-Methyl-2-pentanone	250	237		ug/L		95	76 - 124
Methyl tert-butyl ether	50.0	47.2		ug/L		94	80 - 120
m-Xylene & p-Xylene	50.0	49.0		ug/L		98	80 - 120
n-Butylbenzene	50.0	50.2		ug/L		100	80 - 120
N-Propylbenzene	50.0	49.6		ug/L		99	80 - 120
o-Xylene	50.0	49.1		ug/L		98	80 - 120
p-Isopropyltoluene	50.0	48.0		ug/L		96	80 - 120
sec-Butylbenzene	50.0	49.1		ug/L		98	80 - 120
Styrene	50.0	50.7		ug/L		101	80 - 120
tert-Butylbenzene	50.0	48.3		ug/L		97	80 - 121
1,1,1,2-Tetrachloroethane	50.0	47.4		ug/L		95	80 - 121
1,1,2,2-Tetrachloroethane	50.0	48.2		ug/L		96	80 - 120
Tetrachloroethene	50.0	50.3		ug/L		101	80 - 121
Toluene	50.0	49.7		ug/L		99	80 - 113
trans-1,2-Dichloroethene	50.0	46.9		ug/L		94	80 - 120
trans-1,3-Dichloropropene	50.0	52.2		ug/L		104	80 - 120
1,2,3-Trichlorobenzene	50.0	48.4		ug/L		97	61 - 141
1,2,4-Trichlorobenzene	50.0	49.7		ug/L		99	68 - 128
1,1,1-Trichloroethane	50.0	47.4		ug/L		95	80 - 120
1,1,2-Trichloroethane	50.0	50.3		ug/L		101	80 - 120
Trichloroethene	50.0	49.9		ug/L		100	80 - 120
Trichlorofluoromethane	50.0	57.2		ug/L		114	60 - 141
1,2,3-Trichloropropane	50.0	45.8		ug/L		92	80 - 123
1,2,4-Trimethylbenzene	50.0	47.2		ug/L		94	80 - 120
1,3,5-Trimethylbenzene	50.0	46.9		ug/L		94	80 - 120
Vinyl acetate	100	103		ug/L		103	67 - 135
Vinyl chloride	50.0	53.6		ug/L		107	71 - 128
Xylenes, Total	100	98.1		ug/L		98	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565693/3
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*73 - 131*
Dibromofluoromethane (Surr)	*95*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Lab Sample ID: LCSD 680-565693/4
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone			250	255		ug/L		102	70 - 135	5	30
Benzene			50.0	49.3		ug/L		99	80 - 120	1	20
Bromobenzene			50.0	49.0		ug/L		98	80 - 121	3	20
Bromochloromethane			50.0	39.7	*	ug/L		79	80 - 120	7	20
Bromodichloromethane			50.0	48.5		ug/L		97	80 - 120	1	20
Bromoform			50.0	41.2		ug/L		82	74 - 126	4	20
Bromomethane			50.0	23.3	*	ug/L		47	62 - 130	2	20
2-Butanone			250	234		ug/L		94	80 - 131	7	20
Carbon disulfide			50.0	52.3		ug/L		105	80 - 120	0	20
Carbon tetrachloride			50.0	40.3		ug/L		81	76 - 123	3	20
Chlorobenzene			50.0	49.0		ug/L		98	80 - 120	1	20
Chloroethane			50.0	57.4		ug/L		115	66 - 135	5	20
2-Chloroethyl vinyl ether			50.0	28.1	*	ug/L		56	71 - 135	4	50
Chloroform			50.0	47.8		ug/L		96	80 - 120	5	20
Chloromethane			50.0	81.6	*	ug/L		163	69 - 131	1	30
2-Chlorotoluene			50.0	47.2		ug/L		94	80 - 120	0	20
4-Chlorotoluene			50.0	48.1		ug/L		96	80 - 120	1	20
cis-1,2-Dichloroethene			50.0	48.3		ug/L		97	80 - 120	1	20
cis-1,3-Dichloropropene			50.0	50.8		ug/L		102	80 - 120	0	20
Dibromochloromethane			50.0	47.7		ug/L		95	80 - 121	2	20
1,2-Dibromo-3-Chloropropane			50.0	42.6		ug/L		85	71 - 134	2	20
1,2-Dibromoethane			50.0	50.1		ug/L		100	80 - 120	2	20
Dibromomethane			50.0	50.0		ug/L		100	80 - 120	1	20
1,2-Dichlorobenzene			50.0	50.5		ug/L		101	80 - 120	1	20
1,3-Dichlorobenzene			50.0	48.6		ug/L		97	80 - 120	0	20
1,4-Dichlorobenzene			50.0	50.2		ug/L		100	80 - 120	2	20
Dichlorodifluoromethane			50.0	63.3		ug/L		127	47 - 155	2	40
1,1-Dichloroethane			50.0	48.7		ug/L		97	80 - 120	2	20
1,2-Dichloroethane			50.0	45.1		ug/L		90	80 - 120	7	50
1,1-Dichloroethene			50.0	50.1		ug/L		100	76 - 120	1	20
1,2-Dichloroethene, Total			100	95.9		ug/L		96	80 - 120	0	20
1,2-Dichloropropane			50.0	50.0		ug/L		100	80 - 120	0	20
1,3-Dichloropropane			50.0	50.6		ug/L		101	80 - 120	1	20
2,2-Dichloropropane			50.0	47.2		ug/L		94	76 - 126	5	20
1,1-Dichloropropene			50.0	49.6		ug/L		99	80 - 120	2	20
Ethylbenzene			50.0	49.4		ug/L		99	80 - 120	1	20
Hexachlorobutadiene			50.0	46.4		ug/L		93	60 - 140	2	20
2-Hexanone			250	239		ug/L		95	74 - 127	0	20
Isopropylbenzene			50.0	47.9		ug/L		96	80 - 120	2	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565693/4
Matrix: Water
Analysis Batch: 565693

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methylene Chloride	50.0	51.5		ug/L		103	80 - 120	1	20
4-Methyl-2-pentanone	250	228		ug/L		91	76 - 124	4	20
Methyl tert-butyl ether	50.0	47.5		ug/L		95	80 - 120	1	20
m-Xylene & p-Xylene	50.0	48.6		ug/L		97	80 - 120	1	20
n-Butylbenzene	50.0	51.0		ug/L		102	80 - 120	2	20
N-Propylbenzene	50.0	48.5		ug/L		97	80 - 120	2	20
o-Xylene	50.0	47.5		ug/L		95	80 - 120	3	30
p-Isopropyltoluene	50.0	49.0		ug/L		98	80 - 120	2	20
sec-Butylbenzene	50.0	48.5		ug/L		97	80 - 120	1	20
Styrene	50.0	49.1		ug/L		98	80 - 120	3	20
tert-Butylbenzene	50.0	47.9		ug/L		96	80 - 121	1	20
1,1,1,2-Tetrachloroethane	50.0	46.0		ug/L		92	80 - 121	3	20
1,1,2,2-Tetrachloroethane	50.0	45.5		ug/L		91	80 - 120	6	20
Tetrachloroethene	50.0	51.2		ug/L		102	80 - 121	2	20
Toluene	50.0	49.0		ug/L		98	80 - 113	2	20
trans-1,2-Dichloroethene	50.0	47.7		ug/L		95	80 - 120	2	20
trans-1,3-Dichloropropene	50.0	51.2		ug/L		102	80 - 120	2	30
1,2,3-Trichlorobenzene	50.0	48.2		ug/L		96	61 - 141	1	20
1,2,4-Trichlorobenzene	50.0	50.8		ug/L		102	68 - 128	2	20
1,1,1-Trichloroethane	50.0	46.0		ug/L		92	80 - 120	3	20
1,1,2-Trichloroethane	50.0	50.5		ug/L		101	80 - 120	0	20
Trichloroethene	50.0	50.4		ug/L		101	80 - 120	1	20
Trichlorofluoromethane	50.0	59.4		ug/L		119	60 - 141	4	20
1,2,3-Trichloropropane	50.0	43.2		ug/L		86	80 - 123	6	30
1,2,4-Trimethylbenzene	50.0	47.3		ug/L		95	80 - 120	0	20
1,3,5-Trimethylbenzene	50.0	46.4		ug/L		93	80 - 120	1	20
Vinyl acetate	100	101		ug/L		101	67 - 135	2	20
Vinyl chloride	50.0	54.9		ug/L		110	71 - 128	2	20
Xylenes, Total	100	96.1		ug/L		96	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*
Dibromofluoromethane (Surr)	*93*		*80 - 122*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-564685/8-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564685

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10		10	0.76	ug/L		04/02/19 11:58	04/03/19 17:04	1
Acenaphthylene	<10		10	0.85	ug/L		04/02/19 11:58	04/03/19 17:04	1
Acetophenone	<10		10	0.57	ug/L		04/02/19 11:58	04/03/19 17:04	1
Anthracene	<10		10	0.69	ug/L		04/02/19 11:58	04/03/19 17:04	1
Atrazine	<10		10	1.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
Benzaldehyde	<10		10	1.1	ug/L		04/02/19 11:58	04/03/19 17:04	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564685/8-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564685

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	<10		10	0.55	ug/L		04/02/19 11:58	04/03/19 17:04	1
Benzo[a]pyrene	<10		10	0.71	ug/L		04/02/19 11:58	04/03/19 17:04	1
Benzo[b]fluoranthene	<10		10	2.6	ug/L		04/02/19 11:58	04/03/19 17:04	1
Benzo[g,h,i]perylene	<10		10	0.87	ug/L		04/02/19 11:58	04/03/19 17:04	1
Benzo[k]fluoranthene	<10		10	1.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
1,1'-Biphenyl	<10		10	0.58	ug/L		04/02/19 11:58	04/03/19 17:04	1
Bis(2-chloroethoxy)methane	<10		10	0.94	ug/L		04/02/19 11:58	04/03/19 17:04	1
Bis(2-chloroethyl)ether	<10		10	1.1	ug/L		04/02/19 11:58	04/03/19 17:04	1
bis (2-chloroisopropyl) ether	<10		10	0.78	ug/L		04/02/19 11:58	04/03/19 17:04	1
Bis(2-ethylhexyl) phthalate	<10		10	1.6	ug/L		04/02/19 11:58	04/03/19 17:04	1
4-Bromophenyl phenyl ether	<10		10	0.77	ug/L		04/02/19 11:58	04/03/19 17:04	1
Butyl benzyl phthalate	<10		10	1.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
Caprolactam	<10		10	0.79	ug/L		04/02/19 11:58	04/03/19 17:04	1
Carbazole	<10		10	0.71	ug/L		04/02/19 11:58	04/03/19 17:04	1
4-Chloroaniline	<20		20	2.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
4-Chloro-3-methylphenol	<10		10	1.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Chloronaphthalene	<10		10	0.80	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Chlorophenol	<10		10	0.87	ug/L		04/02/19 11:58	04/03/19 17:04	1
4-Chlorophenyl phenyl ether	<10		10	0.84	ug/L		04/02/19 11:58	04/03/19 17:04	1
Chrysene	<10		10	0.51	ug/L		04/02/19 11:58	04/03/19 17:04	1
Dibenz(a,h)anthracene	<10		10	1.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
Dibenzofuran	<10		10	0.79	ug/L		04/02/19 11:58	04/03/19 17:04	1
1,2-Dichlorobenzene	<10		10	0.53	ug/L		04/02/19 11:58	04/03/19 17:04	1
1,3-Dichlorobenzene	<10		10	0.59	ug/L		04/02/19 11:58	04/03/19 17:04	1
1,4-Dichlorobenzene	<10		10	0.54	ug/L		04/02/19 11:58	04/03/19 17:04	1
3,3'-Dichlorobenzidine	<60		60	30	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4-Dichlorophenol	<10		10	1.1	ug/L		04/02/19 11:58	04/03/19 17:04	1
Diethyl phthalate	<10		10	0.88	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4-Dimethylphenol	<10		10	4.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
Dimethyl phthalate	<10		10	0.99	ug/L		04/02/19 11:58	04/03/19 17:04	1
Di-n-butyl phthalate	<10		10	0.83	ug/L		04/02/19 11:58	04/03/19 17:04	1
4,6-Dinitro-2-methylphenol	<50		50	10	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4-Dinitrophenol	<50		50	10	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4-Dinitrotoluene	<10		10	1.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,6-Dinitrotoluene	<10		10	1.1	ug/L		04/02/19 11:58	04/03/19 17:04	1
Di-n-octyl phthalate	<10		10	1.4	ug/L		04/02/19 11:58	04/03/19 17:04	1
Fluoranthene	<10		10	0.74	ug/L		04/02/19 11:58	04/03/19 17:04	1
Fluorene	<10		10	0.96	ug/L		04/02/19 11:58	04/03/19 17:04	1
Hexachlorobenzene	<10		10	0.79	ug/L		04/02/19 11:58	04/03/19 17:04	1
Hexachlorobutadiene	<10		10	0.62	ug/L		04/02/19 11:58	04/03/19 17:04	1
Hexachlorocyclopentadiene	<10		10	2.5	ug/L		04/02/19 11:58	04/03/19 17:04	1
Hexachloroethane	<10		10	0.76	ug/L		04/02/19 11:58	04/03/19 17:04	1
Indeno[1,2,3-cd]pyrene	<10		10	1.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
Isophorone	<10		10	0.90	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Methylnaphthalene	<10		10	0.78	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Methylphenol	<10		10	0.89	ug/L		04/02/19 11:58	04/03/19 17:04	1
3 & 4 Methylphenol	<10		10	1.3	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Nitroaniline	<50		50	1.3	ug/L		04/02/19 11:58	04/03/19 17:04	1
3-Nitroaniline	<50		50	5.0	ug/L		04/02/19 11:58	04/03/19 17:04	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-564685/8-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564685

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Nitroaniline	<50		50	5.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
Nitrobenzene	<10		10	0.73	ug/L		04/02/19 11:58	04/03/19 17:04	1
2-Nitrophenol	<10		10	0.76	ug/L		04/02/19 11:58	04/03/19 17:04	1
4-Nitrophenol	<50		50	1.9	ug/L		04/02/19 11:58	04/03/19 17:04	1
N-Nitrosodi-n-propylamine	<10		10	0.72	ug/L		04/02/19 11:58	04/03/19 17:04	1
N-Nitrosodiphenylamine	<10		10	0.92	ug/L		04/02/19 11:58	04/03/19 17:04	1
Pentachlorophenol	<50		50	2.0	ug/L		04/02/19 11:58	04/03/19 17:04	1
Phenanthrene	<10		10	0.77	ug/L		04/02/19 11:58	04/03/19 17:04	1
Phenol	<10		10	0.83	ug/L		04/02/19 11:58	04/03/19 17:04	1
Pyrene	<10		10	0.63	ug/L		04/02/19 11:58	04/03/19 17:04	1
1,2,4-Trichlorobenzene	<10		10	0.56	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4,5-Trichlorophenol	<10		10	1.2	ug/L		04/02/19 11:58	04/03/19 17:04	1
2,4,6-Trichlorophenol	<10		10	0.85	ug/L		04/02/19 11:58	04/03/19 17:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*26*	*X*	*32 - 113*	*04/02/19 11:58*	*04/03/19 17:04*	*1*
2-Fluorophenol	*16*	*X*	*26 - 109*	*04/02/19 11:58*	*04/03/19 17:04*	*1*
Nitrobenzene-d5	*25*	*X*	*32 - 118*	*04/02/19 11:58*	*04/03/19 17:04*	*1*
Phenol-d5	*10*	*X*	*27 - 110*	*04/02/19 11:58*	*04/03/19 17:04*	*1*
Terphenyl-d14	*55*		*10 - 126*	*04/02/19 11:58*	*04/03/19 17:04*	*1*
2,4,6-Tribromophenol	*36*	*X*	*39 - 124*	*04/02/19 11:58*	*04/03/19 17:04*	*1*

Lab Sample ID: LCS 680-564685/9-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	100	20.0	*	ug/L		20	48 - 130
Acenaphthylene	100	20.4	*	ug/L		20	48 - 130
Anthracene	100	43.9	*	ug/L		44	49 - 130
Atrazine	100	23.0	*	ug/L		23	39 - 130
Benzaldehyde	100	13.5		ug/L		14	14 - 130
Benzo[a]anthracene	100	66.7		ug/L		67	44 - 130
Benzo[a]pyrene	100	63.9		ug/L		64	44 - 130
Benzo[b]fluoranthene	100	64.3		ug/L		64	43 - 130
Benzo[g,h,i]perylene	100	67.1		ug/L		67	41 - 130
Benzo[k]fluoranthene	100	68.4		ug/L		68	40 - 130
1,1'-Biphenyl	100	19.2	*	ug/L		19	45 - 130
Bis(2-chloroethoxy)methane	100	18.5	*	ug/L		19	47 - 130
Bis(2-chloroethyl)ether	100	17.7	*	ug/L		18	32 - 130
bis (2-chloroisopropyl) ether	100	18.8	*	ug/L		19	26 - 130
Bis(2-ethylhexyl) phthalate	100	71.4		ug/L		71	45 - 130
4-Bromophenyl phenyl ether	100	34.7	*	ug/L		35	47 - 130
Butyl benzyl phthalate	100	65.7		ug/L		66	50 - 130
Caprolactam	100	22.5	*	ug/L		22	26 - 130
Carbazole	100	54.0		ug/L		54	54 - 130
4-Chloroaniline	100	5.50	J *	ug/L		5	42 - 130
4-Chloro-3-methylphenol	100	17.2	*	ug/L		17	47 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564685/9-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Chloronaphthalene	100	18.2	*	ug/L		18	44 - 130
2-Chlorophenol	100	18.3	*	ug/L		18	39 - 130
4-Chlorophenyl phenyl ether	100	28.8	*	ug/L		29	45 - 130
Chrysene	100	68.2		ug/L		68	47 - 130
Dibenz(a,h)anthracene	100	68.8		ug/L		69	41 - 130
Dibenzofuran	100	24.5	*	ug/L		25	50 - 130
1,2-Dichlorobenzene	100	16.8	*	ug/L		17	31 - 130
1,3-Dichlorobenzene	100	16.9	*	ug/L		17	30 - 130
1,4-Dichlorobenzene	100	17.4	*	ug/L		17	31 - 130
3,3'-Dichlorobenzidine	100	58.0	J	ug/L		58	46 - 130
2,4-Dichlorophenol	100	20.2	*	ug/L		20	44 - 130
Diethyl phthalate	100	48.9	*	ug/L		49	53 - 130
2,4-Dimethylphenol	100	16.1	*	ug/L		16	37 - 130
Dimethyl phthalate	100	38.6	*	ug/L		39	53 - 130
Di-n-butyl phthalate	100	60.2		ug/L		60	51 - 130
4,6-Dinitro-2-methylphenol	200	113		ug/L		57	42 - 130
2,4-Dinitrophenol	200	77.5		ug/L		39	31 - 130
2,4-Dinitrotoluene	100	46.1	*	ug/L		46	52 - 130
2,6-Dinitrotoluene	100	35.9	*	ug/L		36	52 - 130
Di-n-octyl phthalate	100	70.2		ug/L		70	42 - 130
Fluoranthene	100	59.4		ug/L		59	47 - 130
Fluorene	100	31.2	*	ug/L		31	50 - 130
Hexachlorobenzene	100	36.3	*	ug/L		36	43 - 130
Hexachlorobutadiene	100	20.3	*	ug/L		20	27 - 130
Hexachlorocyclopentadiene	100	6.76	J *	ug/L		7	11 - 130
Hexachloroethane	100	18.9	*	ug/L		19	29 - 130
Indeno[1,2,3-cd]pyrene	100	73.7		ug/L		74	31 - 130
Isophorone	100	18.4	*	ug/L		18	47 - 130
2-Methylnaphthalene	100	18.2	*	ug/L		18	40 - 130
2-Methylphenol	100	15.7	*	ug/L		16	40 - 130
3 & 4 Methylphenol	100	15.1	*	ug/L		15	42 - 130
2-Nitroaniline	100	29.2	J *	ug/L		29	51 - 130
3-Nitroaniline	100	29.3	J *	ug/L		29	53 - 130
4-Nitroaniline	100	45.5	J *	ug/L		46	49 - 130
Nitrobenzene	100	16.8	*	ug/L		17	43 - 130
2-Nitrophenol	100	17.7	*	ug/L		18	43 - 130
4-Nitrophenol	200	90.9		ug/L		45	44 - 130
N-Nitrosodi-n-propylamine	100	18.4	*	ug/L		18	42 - 130
N-Nitrosodiphenylamine	100	36.1	*	ug/L		36	50 - 130
Pentachlorophenol	200	84.9		ug/L		42	33 - 130
Phenanthrene	100	45.8	*	ug/L		46	51 - 130
Phenol	100	8.66	J *	ug/L		9	35 - 130
Pyrene	100	59.8		ug/L		60	52 - 130
1,2,4-Trichlorobenzene	100	17.4	*	ug/L		17	33 - 130
2,4,5-Trichlorophenol	100	22.7	*	ug/L		23	48 - 130
2,4,6-Trichlorophenol	100	23.3	*	ug/L		23	47 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-564685/9-A
Matrix: Water
Analysis Batch: 564905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564685

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	20	X	32 - 113
2-Fluorophenol	14	X	26 - 109
Nitrobenzene-d5	17	X	32 - 118
Phenol-d5	9	X	27 - 110
Terphenyl-d14	51		10 - 126
2,4,6-Tribromophenol	38	X	39 - 124

Lab Sample ID: 680-166627-7 MS
Matrix: Water
Analysis Batch: 564905

Client Sample ID: PW2B (032719)
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	<9.9	* F1	99.4	24.8	F1	ug/L		25	48 - 130
Acenaphthylene	<9.9	* F1	99.4	22.7	F1	ug/L		23	48 - 130
Anthracene	<9.9	* F1	99.4	41.6	F1	ug/L		42	49 - 130
Atrazine	<9.9	* F1	99.4	18.2	J F1	ug/L		18	39 - 130
Benzaldehyde	<9.9		99.4	23.7		ug/L		24	14 - 130
Benzo[a]anthracene	<9.9		99.4	59.7		ug/L		60	44 - 130
Benzo[a]pyrene	<9.9		99.4	54.0		ug/L		54	44 - 130
Benzo[b]fluoranthene	<9.9		99.4	57.2		ug/L		58	43 - 130
Benzo[g,h,i]perylene	<9.9		99.4	60.1		ug/L		60	41 - 130
Benzo[k]fluoranthene	<9.9		99.4	63.0		ug/L		63	40 - 130
1,1'-Biphenyl	<9.9	* F1	99.4	28.1	F1	ug/L		28	45 - 130
Bis(2-chloroethoxy)methane	<9.9	* F1	99.4	27.2	F1	ug/L		27	47 - 130
Bis(2-chloroethyl)ether	<9.9	* F1	99.4	26.3	F1	ug/L		26	32 - 130
bis (2-chloroisopropyl) ether	<9.9	* F1	99.4	23.5	F1	ug/L		24	26 - 130
Bis(2-ethylhexyl) phthalate	<9.9		99.4	61.5		ug/L		62	45 - 130
4-Bromophenyl phenyl ether	<9.9	* F1	99.4	38.6	F1	ug/L		39	47 - 130
Butyl benzyl phthalate	<9.9		99.4	53.5		ug/L		54	50 - 130
Caprolactam	<9.9	* F1	99.4	15.5	J F1	ug/L		16	26 - 130
Carbazole	<9.9	F1	99.4	25.6	F1	ug/L		26	54 - 130
4-Chloroaniline	<20	* F1	99.4	6.82	J F1	ug/L		7	42 - 130
4-Chloro-3-methylphenol	<9.9	* F1	99.4	24.4	F1	ug/L		25	47 - 130
2-Chloronaphthalene	<9.9	* F1	99.4	26.2	F1	ug/L		26	44 - 130
2-Chlorophenol	<9.9	* F1	99.4	22.7	F1	ug/L		23	39 - 130
4-Chlorophenyl phenyl ether	<9.9	* F1	99.4	33.6	F1	ug/L		34	45 - 130
Chrysene	<9.9		99.4	60.1		ug/L		60	47 - 130
Dibenz(a,h)anthracene	<9.9		99.4	60.9		ug/L		61	41 - 130
Dibenzofuran	<9.9	* F1	99.4	30.3	F1	ug/L		30	50 - 130
1,2-Dichlorobenzene	<9.9	* F1	99.4	20.6	F1	ug/L		21	31 - 130
1,3-Dichlorobenzene	<9.9	* F1	99.4	20.2	F1	ug/L		20	30 - 130
1,4-Dichlorobenzene	<9.9	* F1	99.4	19.6	J F1	ug/L		20	31 - 130
3,3'-Dichlorobenzidine	<60	F1	99.4	<120	F1	ug/L		0	46 - 130
2,4-Dichlorophenol	<9.9	* F1	99.4	25.9	F1	ug/L		26	44 - 130
Diethyl phthalate	<9.9	* F1	99.4	42.7	F1	ug/L		43	53 - 130
2,4-Dimethylphenol	<9.9	* F1	99.4	26.4	F1	ug/L		27	37 - 130
Dimethyl phthalate	<9.9	* F1	99.4	35.6	F1	ug/L		36	53 - 130
Di-n-butyl phthalate	<9.9		99.4	54.1		ug/L		54	51 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-166627-7 MS
Matrix: Water
Analysis Batch: 564905

Client Sample ID: PW2B (032719)
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,6-Dinitro-2-methylphenol	<50	F1	199	77.9	J F1	ug/L		39	42 - 130
2,4-Dinitrophenol	<50	F1	199	56.6	J F1	ug/L		28	31 - 130
2,4-Dinitrotoluene	<9.9	* F1	99.4	41.5	F1	ug/L		42	52 - 130
2,6-Dinitrotoluene	<9.9	* F1	99.4	32.4	F1	ug/L		33	52 - 130
Di-n-octyl phthalate	<9.9		99.4	59.6		ug/L		60	42 - 130
Fluoranthene	<9.9		99.4	56.0		ug/L		56	47 - 130
Fluorene	<9.9	* F1	99.4	32.4	F1	ug/L		33	50 - 130
Hexachlorobenzene	<9.9	* F1	99.4	37.2	F1	ug/L		37	43 - 130
Hexachlorobutadiene	<9.9	* F1	99.4	22.5	F1	ug/L		23	27 - 130
Hexachlorocyclopentadiene	<9.9	* F1	99.4	8.56	J F1	ug/L		9	11 - 130
Hexachloroethane	<9.9	* F1	99.4	20.0	F1	ug/L		20	29 - 130
Indeno[1,2,3-cd]pyrene	<9.9		99.4	63.6		ug/L		64	31 - 130
Isophorone	<9.9	* F1	99.4	27.3	F1	ug/L		27	47 - 130
2-Methylnaphthalene	<9.9	* F1	99.4	23.0	F1	ug/L		23	40 - 130
2-Methylphenol	<9.9	* F1	99.4	20.8	F1	ug/L		21	40 - 130
3 & 4 Methylphenol	<9.9	* F1	99.4	20.1	F1	ug/L		20	42 - 130
2-Nitroaniline	<50	* F1	99.4	29.2	J F1	ug/L		29	51 - 130
3-Nitroaniline	<50	* F1	99.4	20.0	J F1	ug/L		20	53 - 130
4-Nitroaniline	<50	* F1	99.4	29.6	J F1	ug/L		30	49 - 130
Nitrobenzene	<9.9	* F1	99.4	25.5	F1	ug/L		26	43 - 130
2-Nitrophenol	<9.9	* F1	99.4	23.4	F1	ug/L		24	43 - 130
4-Nitrophenol	<50	F1	199	68.1	J F1	ug/L		34	44 - 130
N-Nitrosodi-n-propylamine	<9.9	* F1	99.4	26.9	F1	ug/L		27	42 - 130
N-Nitrosodiphenylamine	<9.9	* F1	99.4	22.1	F1	ug/L		22	50 - 130
Pentachlorophenol	<50		199	67.7	J	ug/L		34	33 - 130
Phenanthrene	<9.9	* F1	99.4	42.0	F1	ug/L		42	51 - 130
Phenol	<9.9	* F1	99.4	14.5	J F1	ug/L		15	35 - 130
Pyrene	<9.9		99.4	53.1		ug/L		53	52 - 130
1,2,4-Trichlorobenzene	<9.9	* F1	99.4	20.8	F1	ug/L		21	33 - 130
2,4,5-Trichlorophenol	<9.9	* F1	99.4	28.2	F1	ug/L		28	48 - 130
2,4,6-Trichlorophenol	<9.9	* F1	99.4	30.9	F1	ug/L		31	47 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2-Fluorobiphenyl	*27*	*X*	*32 - 113*
2-Fluorophenol	*18*	*X*	*26 - 109*
Nitrobenzene-d5	*26*	*X*	*32 - 118*
Phenol-d5	*14*	*X*	*27 - 110*
Terphenyl-d14	*24*		*10 - 126*
2,4,6-Tribromophenol	*36*	*X*	*39 - 124*

Lab Sample ID: 680-166627-7 MSD
Matrix: Water
Analysis Batch: 564905

Client Sample ID: PW2B (032719)
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	<9.9	* F1	93.6	35.2	F1	ug/L		38	48 - 130	35	50
Acenaphthylene	<9.9	* F1	93.6	18.6	J F1	ug/L		20	48 - 130	20	50
Anthracene	<9.9	* F1	93.6	54.4		ug/L		58	49 - 130	27	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-166627-7 MSD
Matrix: Water
Analysis Batch: 564905

Client Sample ID: PW2B (032719)
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Atrazine	<9.9	* F1	93.6	18.3	J F1	ug/L		20	39 - 130	1	50
Benzaldehyde	<9.9		93.6	23.4		ug/L		25	14 - 130	2	50
Benzo[a]anthracene	<9.9		93.6	62.8		ug/L		67	44 - 130	5	50
Benzo[a]pyrene	<9.9		93.6	55.0		ug/L		59	44 - 130	2	50
Benzo[b]fluoranthene	<9.9		93.6	59.8		ug/L		64	43 - 130	5	50
Benzo[g,h,i]perylene	<9.9		93.6	61.3		ug/L		65	41 - 130	2	50
Benzo[k]fluoranthene	<9.9		93.6	61.8		ug/L		66	40 - 130	2	50
1,1'-Biphenyl	<9.9	* F1	93.6	36.4	F1	ug/L		39	45 - 130	26	50
Bis(2-chloroethoxy)methane	<9.9	* F1	93.6	28.7	F1	ug/L		31	47 - 130	5	50
Bis(2-chloroethyl)ether	<9.9	* F1	93.6	22.4	F1	ug/L		24	32 - 130	16	50
bis (2-chloroisopropyl) ether	<9.9	* F1	93.6	22.2	F1	ug/L		24	26 - 130	6	50
Bis(2-ethylhexyl) phthalate	<9.9		93.6	63.0		ug/L		67	45 - 130	2	50
4-Bromophenyl phenyl ether	<9.9	* F1	93.6	53.9		ug/L		58	47 - 130	33	50
Butyl benzyl phthalate	<9.9		93.6	59.7		ug/L		64	50 - 130	11	50
Caprolactam	<9.9	* F1	93.6	20.2	F1	ug/L		22	26 - 130	26	50
Carbazole	<9.9	F1	93.6	19.1	F1	ug/L		20	54 - 130	29	50
4-Chloroaniline	<20	* F1	93.6	5.51	J F1	ug/L		6	42 - 130	21	50
4-Chloro-3-methylphenol	<9.9	* F1	93.6	33.9	F1	ug/L		36	47 - 130	33	50
2-Chloronaphthalene	<9.9	* F1	93.6	34.2	F1	ug/L		37	44 - 130	26	50
2-Chlorophenol	<9.9	* F1	93.6	20.6	F1	ug/L		22	39 - 130	10	50
4-Chlorophenyl phenyl ether	<9.9	* F1	93.6	50.0		ug/L		53	45 - 130	39	50
Chrysene	<9.9		93.6	64.2		ug/L		69	47 - 130	7	50
Dibenz(a,h)anthracene	<9.9		93.6	61.6		ug/L		66	41 - 130	1	50
Dibenzofuran	<9.9	* F1	93.6	45.0	F1	ug/L		48	50 - 130	39	50
1,2-Dichlorobenzene	<9.9	* F1	93.6	20.6	F1	ug/L		22	31 - 130	0	50
1,3-Dichlorobenzene	<9.9	* F1	93.6	21.0	F1	ug/L		22	30 - 130	4	50
1,4-Dichlorobenzene	<9.9	* F1	93.6	20.5	F1	ug/L		22	31 - 130	5	50
3,3'-Dichlorobenzidine	<60	F1	93.6	<110	F1	ug/L		0	46 - 130	NC	50
2,4-Dichlorophenol	<9.9	* F1	93.6	25.0	F1	ug/L		27	44 - 130	3	50
Diethyl phthalate	<9.9	* F1	93.6	53.5		ug/L		57	53 - 130	23	50
2,4-Dimethylphenol	<9.9	* F1	93.6	23.2	F1	ug/L		25	37 - 130	13	50
Dimethyl phthalate	<9.9	* F1	93.6	49.4		ug/L		53	53 - 130	33	50
Di-n-butyl phthalate	<9.9		93.6	60.6		ug/L		65	51 - 130	11	50
4,6-Dinitro-2-methylphenol	<50	F1	187	105		ug/L		56	42 - 130	29	50
2,4-Dinitrophenol	<50	F1	187	77.5	J	ug/L		41	31 - 130	31	50
2,4-Dinitrotoluene	<9.9	* F1	93.6	54.8		ug/L		59	52 - 130	28	50
2,6-Dinitrotoluene	<9.9	* F1	93.6	51.0		ug/L		55	52 - 130	45	50
Di-n-octyl phthalate	<9.9		93.6	62.2		ug/L		66	42 - 130	4	50
Fluoranthene	<9.9		93.6	61.2		ug/L		65	47 - 130	9	50
Fluorene	<9.9	* F1	93.6	49.8		ug/L		53	50 - 130	42	50
Hexachlorobenzene	<9.9	* F1	93.6	57.4		ug/L		61	43 - 130	43	50
Hexachlorobutadiene	<9.9	* F1	93.6	21.7	F1	ug/L		23	27 - 130	4	50
Hexachlorocyclopentadiene	<9.9	* F1	93.6	7.46	J F1	ug/L		8	11 - 130	14	50
Hexachloroethane	<9.9	* F1	93.6	22.3	F1	ug/L		24	29 - 130	11	50
Indeno[1,2,3-cd]pyrene	<9.9		93.6	63.4		ug/L		68	31 - 130	0	50
Isophorone	<9.9	* F1	93.6	32.0	F1	ug/L		34	47 - 130	16	50
2-Methylnaphthalene	<9.9	* F1	93.6	30.6	F1	ug/L		33	40 - 130	28	50
2-Methylphenol	<9.9	* F1	93.6	18.8	J F1	ug/L		20	40 - 130	10	50
3 & 4 Methylphenol	<9.9	* F1	93.6	18.4	J F1	ug/L		20	42 - 130	9	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-166627-7 MSD
Matrix: Water
Analysis Batch: 564905

Client Sample ID: PW2B (032719)
Prep Type: Total/NA
Prep Batch: 564685

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Nitroaniline	<50	* F1	93.6	41.5	J F1	ug/L		44	51 - 130	35	50
3-Nitroaniline	<50	* F1	93.6	15.2	J F1	ug/L		16	53 - 130	27	50
4-Nitroaniline	<50	* F1	93.6	27.2	J F1	ug/L		29	49 - 130	8	50
Nitrobenzene	<9.9	* F1	93.6	23.4	F1	ug/L		25	43 - 130	9	50
2-Nitrophenol	<9.9	* F1	93.6	23.6	F1	ug/L		25	43 - 130	1	50
4-Nitrophenol	<50	F1	187	83.9	J	ug/L		45	44 - 130	21	50
N-Nitrosodi-n-propylamine	<9.9	* F1	93.6	34.1	F1	ug/L		36	42 - 130	24	50
N-Nitrosodiphenylamine	<9.9	* F1	93.6	17.0	J F1	ug/L		18	50 - 130	26	50
Pentachlorophenol	<50		187	105		ug/L		56	33 - 130	43	50
Phenanthrene	<9.9	* F1	93.6	57.2		ug/L		61	51 - 130	31	50
Phenol	<9.9	* F1	93.6	12.8	J F1	ug/L		14	35 - 130	12	50
Pyrene	<9.9		93.6	61.0		ug/L		65	52 - 130	14	50
1,2,4-Trichlorobenzene	<9.9	* F1	93.6	19.8	F1	ug/L		21	33 - 130	5	50
2,4,5-Trichlorophenol	<9.9	* F1	93.6	41.7	F1	ug/L		45	48 - 130	39	50
2,4,6-Trichlorophenol	<9.9	* F1	93.6	38.3	F1	ug/L		41	47 - 130	21	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl	*36*		*32 - 113*
2-Fluorophenol	*16*	*X*	*26 - 109*
Nitrobenzene-d5	*24*	*X*	*32 - 118*
Phenol-d5	*14*	*X*	*27 - 110*
Terphenyl-d14	*26*		*10 - 126*
2,4,6-Tribromophenol	*52*		*39 - 124*

Lab Sample ID: MB 680-565543/6-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 565543

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10		10	0.76	ug/L		04/09/19 15:03	04/10/19 16:15	1
Acenaphthylene	<10		10	0.85	ug/L		04/09/19 15:03	04/10/19 16:15	1
Acetophenone	<10		10	0.57	ug/L		04/09/19 15:03	04/10/19 16:15	1
Anthracene	<10		10	0.69	ug/L		04/09/19 15:03	04/10/19 16:15	1
Atrazine	<10		10	1.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzaldehyde	<10		10	1.1	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzo[a]anthracene	<10		10	0.55	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzo[a]pyrene	<10		10	0.71	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzo[b]fluoranthene	<10		10	2.6	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzo[g,h,i]perylene	<10		10	0.87	ug/L		04/09/19 15:03	04/10/19 16:15	1
Benzo[k]fluoranthene	<10		10	1.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
1,1'-Biphenyl	<10		10	0.58	ug/L		04/09/19 15:03	04/10/19 16:15	1
Bis(2-chloroethoxy)methane	<10		10	0.94	ug/L		04/09/19 15:03	04/10/19 16:15	1
Bis(2-chloroethyl)ether	<10		10	1.1	ug/L		04/09/19 15:03	04/10/19 16:15	1
bis (2-chloroisopropyl) ether	<10		10	0.78	ug/L		04/09/19 15:03	04/10/19 16:15	1
Bis(2-ethylhexyl) phthalate	<10		10	1.6	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Bromophenyl phenyl ether	<10		10	0.77	ug/L		04/09/19 15:03	04/10/19 16:15	1
Butyl benzyl phthalate	<10		10	1.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
Caprolactam	<10		10	0.79	ug/L		04/09/19 15:03	04/10/19 16:15	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-565543/6-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 565543

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbazole	<10		10	0.71	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Chloroaniline	<20		20	2.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Chloro-3-methylphenol	<10		10	1.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Chloronaphthalene	<10		10	0.80	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Chlorophenol	<10		10	0.87	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Chlorophenyl phenyl ether	<10		10	0.84	ug/L		04/09/19 15:03	04/10/19 16:15	1
Chrysene	<10		10	0.51	ug/L		04/09/19 15:03	04/10/19 16:15	1
Dibenz(a,h)anthracene	<10		10	1.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
Dibenzofuran	<10		10	0.79	ug/L		04/09/19 15:03	04/10/19 16:15	1
1,2-Dichlorobenzene	<10		10	0.53	ug/L		04/09/19 15:03	04/10/19 16:15	1
1,3-Dichlorobenzene	<10		10	0.59	ug/L		04/09/19 15:03	04/10/19 16:15	1
1,4-Dichlorobenzene	<10		10	0.54	ug/L		04/09/19 15:03	04/10/19 16:15	1
3,3'-Dichlorobenzidine	<60		60	30	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4-Dichlorophenol	<10		10	1.1	ug/L		04/09/19 15:03	04/10/19 16:15	1
Diethyl phthalate	<10		10	0.88	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4-Dimethylphenol	<10		10	4.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
Dimethyl phthalate	<10		10	0.99	ug/L		04/09/19 15:03	04/10/19 16:15	1
Di-n-butyl phthalate	<10		10	0.83	ug/L		04/09/19 15:03	04/10/19 16:15	1
4,6-Dinitro-2-methylphenol	<50		50	10	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4-Dinitrophenol	<50		50	10	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4-Dinitrotoluene	<10		10	1.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,6-Dinitrotoluene	<10		10	1.1	ug/L		04/09/19 15:03	04/10/19 16:15	1
Di-n-octyl phthalate	<10		10	1.4	ug/L		04/09/19 15:03	04/10/19 16:15	1
Fluoranthene	<10		10	0.74	ug/L		04/09/19 15:03	04/10/19 16:15	1
Fluorene	<10		10	0.96	ug/L		04/09/19 15:03	04/10/19 16:15	1
Hexachlorobenzene	<10		10	0.79	ug/L		04/09/19 15:03	04/10/19 16:15	1
Hexachlorobutadiene	<10		10	0.62	ug/L		04/09/19 15:03	04/10/19 16:15	1
Hexachlorocyclopentadiene	<10		10	2.5	ug/L		04/09/19 15:03	04/10/19 16:15	1
Hexachloroethane	<10		10	0.76	ug/L		04/09/19 15:03	04/10/19 16:15	1
Indeno[1,2,3-cd]pyrene	<10		10	1.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
Isophorone	<10		10	0.90	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Methylnaphthalene	<10		10	0.78	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Methylphenol	<10		10	0.89	ug/L		04/09/19 15:03	04/10/19 16:15	1
3 & 4 Methylphenol	<10		10	1.3	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Nitroaniline	<50		50	1.3	ug/L		04/09/19 15:03	04/10/19 16:15	1
3-Nitroaniline	<50		50	5.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Nitroaniline	<50		50	5.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
Nitrobenzene	<10		10	0.73	ug/L		04/09/19 15:03	04/10/19 16:15	1
2-Nitrophenol	<10		10	0.76	ug/L		04/09/19 15:03	04/10/19 16:15	1
4-Nitrophenol	<50		50	1.9	ug/L		04/09/19 15:03	04/10/19 16:15	1
N-Nitrosodi-n-propylamine	<10		10	0.72	ug/L		04/09/19 15:03	04/10/19 16:15	1
N-Nitrosodiphenylamine	<10		10	0.92	ug/L		04/09/19 15:03	04/10/19 16:15	1
Pentachlorophenol	<50		50	2.0	ug/L		04/09/19 15:03	04/10/19 16:15	1
Phenanthrene	<10		10	0.77	ug/L		04/09/19 15:03	04/10/19 16:15	1
Phenol	<10		10	0.83	ug/L		04/09/19 15:03	04/10/19 16:15	1
Pyrene	<10		10	0.63	ug/L		04/09/19 15:03	04/10/19 16:15	1
1,2,4-Trichlorobenzene	<10		10	0.56	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4,5-Trichlorophenol	<10		10	1.2	ug/L		04/09/19 15:03	04/10/19 16:15	1
2,4,6-Trichlorophenol	<10		10	0.85	ug/L		04/09/19 15:03	04/10/19 16:15	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	35		32 - 113	04/09/19 15:03	04/10/19 16:15	1
2-Fluorophenol	55		26 - 109	04/09/19 15:03	04/10/19 16:15	1
Nitrobenzene-d5	60		32 - 118	04/09/19 15:03	04/10/19 16:15	1
Phenol-d5	58		27 - 110	04/09/19 15:03	04/10/19 16:15	1
Terphenyl-d14	60		10 - 126	04/09/19 15:03	04/10/19 16:15	1
2,4,6-Tribromophenol	82		39 - 124	04/09/19 15:03	04/10/19 16:15	1

Lab Sample ID: LCS 680-565543/7-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 565543

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	100	53.9		ug/L		54	48 - 130
Acenaphthylene	100	60.9		ug/L		61	48 - 130
Anthracene	100	71.6		ug/L		72	49 - 130
Atrazine	100	70.9		ug/L		71	39 - 130
Benzaldehyde	100	40.7		ug/L		41	14 - 130
Benzo[a]anthracene	100	72.1		ug/L		72	44 - 130
Benzo[a]pyrene	100	65.7		ug/L		66	44 - 130
Benzo[b]fluoranthene	100	71.2		ug/L		71	43 - 130
Benzo[g,h,i]perylene	100	68.0		ug/L		68	41 - 130
Benzo[k]fluoranthene	100	68.3		ug/L		68	40 - 130
1,1'-Biphenyl	100	60.0		ug/L		60	45 - 130
Bis(2-chloroethoxy)methane	100	62.8		ug/L		63	47 - 130
Bis(2-chloroethyl)ether	100	57.7		ug/L		58	32 - 130
bis (2-chloroisopropyl) ether	100	53.3		ug/L		53	26 - 130
Bis(2-ethylhexyl) phthalate	100	76.0		ug/L		76	45 - 130
4-Bromophenyl phenyl ether	100	61.0		ug/L		61	47 - 130
Butyl benzyl phthalate	100	76.1		ug/L		76	50 - 130
Caprolactam	100	39.7		ug/L		40	26 - 130
Carbazole	100	77.5		ug/L		77	54 - 130
4-Chloroaniline	100	46.7		ug/L		47	42 - 130
4-Chloro-3-methylphenol	100	76.4		ug/L		76	47 - 130
2-Chloronaphthalene	100	58.6		ug/L		59	44 - 130
2-Chlorophenol	100	58.5		ug/L		58	39 - 130
4-Chlorophenyl phenyl ether	100	64.2		ug/L		64	45 - 130
Chrysene	100	74.0		ug/L		74	47 - 130
Dibenz(a,h)anthracene	100	69.6		ug/L		70	41 - 130
Dibenzofuran	100	62.9		ug/L		63	50 - 130
1,2-Dichlorobenzene	100	51.1		ug/L		51	31 - 130
1,3-Dichlorobenzene	100	49.8		ug/L		50	30 - 130
1,4-Dichlorobenzene	100	51.6		ug/L		52	31 - 130
3,3'-Dichlorobenzidine	100	68.0		ug/L		68	46 - 130
2,4-Dichlorophenol	100	70.9		ug/L		71	44 - 130
Diethyl phthalate	100	86.1		ug/L		86	53 - 130
2,4-Dimethylphenol	100	57.9		ug/L		58	37 - 130
Dimethyl phthalate	100	81.0		ug/L		81	53 - 130
Di-n-butyl phthalate	100	78.5		ug/L		79	51 - 130
4,6-Dinitro-2-methylphenol	200	190		ug/L		95	42 - 130
2,4-Dinitrophenol	200	172		ug/L		86	31 - 130
2,4-Dinitrotoluene	100	83.0		ug/L		83	52 - 130

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-565543/7-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 565543

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,6-Dinitrotoluene	100	79.6		ug/L		80	52 - 130
Di-n-octyl phthalate	100	73.6		ug/L		74	42 - 130
Fluoranthene	100	74.8		ug/L		75	47 - 130
Fluorene	100	66.5		ug/L		67	50 - 130
Hexachlorobenzene	100	64.1		ug/L		64	43 - 130
Hexachlorobutadiene	100	56.4		ug/L		56	27 - 130
Hexachlorocyclopentadiene	100	21.1		ug/L		21	11 - 130
Hexachloroethane	100	49.2		ug/L		49	29 - 130
Indeno[1,2,3-cd]pyrene	100	71.3		ug/L		71	31 - 130
Isophorone	100	73.7		ug/L		74	47 - 130
2-Methylnaphthalene	100	60.2		ug/L		60	40 - 130
2-Methylphenol	100	65.5		ug/L		65	40 - 130
3 & 4 Methylphenol	100	65.4		ug/L		65	42 - 130
2-Nitroaniline	100	82.8		ug/L		83	51 - 130
3-Nitroaniline	100	66.6		ug/L		67	53 - 130
4-Nitroaniline	100	64.4		ug/L		64	49 - 130
Nitrobenzene	100	64.4		ug/L		64	43 - 130
2-Nitrophenol	100	64.9		ug/L		65	43 - 130
4-Nitrophenol	200	151		ug/L		75	44 - 130
N-Nitrosodi-n-propylamine	100	69.7		ug/L		70	42 - 130
N-Nitrosodiphenylamine	100	73.1		ug/L		73	50 - 130
Pentachlorophenol	200	174		ug/L		87	33 - 130
Phenanthrene	100	67.2		ug/L		67	51 - 130
Phenol	100	44.3		ug/L		44	35 - 130
Pyrene	100	75.1		ug/L		75	52 - 130
1,2,4-Trichlorobenzene	100	55.8		ug/L		56	33 - 130
2,4,5-Trichlorophenol	100	79.9		ug/L		80	48 - 130
2,4,6-Trichlorophenol	100	79.4		ug/L		79	47 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*58*		*32 - 113*
2-Fluorophenol	*51*		*26 - 109*
Nitrobenzene-d5	*63*		*32 - 118*
Phenol-d5	*51*		*27 - 110*
Terphenyl-d14	*57*		*10 - 126*
2,4,6-Tribromophenol	*88*		*39 - 124*

Lab Sample ID: LCSD 680-565543/8-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 565543

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	100	56.2		ug/L		56	48 - 130	4	50
Acenaphthylene	100	64.3		ug/L		64	48 - 130	5	50
Anthracene	100	74.6		ug/L		75	49 - 130	4	50
Atrazine	100	73.7		ug/L		74	39 - 130	4	50
Benzaldehyde	100	46.4		ug/L		46	14 - 130	13	50
Benzo[a]anthracene	100	78.4		ug/L		78	44 - 130	8	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565543/8-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 565543

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[a]pyrene	100	68.7		ug/L		69	44 - 130	5	50
Benzo[b]fluoranthene	100	75.7		ug/L		76	43 - 130	6	50
Benzo[g,h,i]perylene	100	70.9		ug/L		71	41 - 130	4	50
Benzo[k]fluoranthene	100	71.7		ug/L		72	40 - 130	5	50
1,1'-Biphenyl	100	64.4		ug/L		64	45 - 130	7	50
Bis(2-chloroethoxy)methane	100	63.8		ug/L		64	47 - 130	2	50
Bis(2-chloroethyl)ether	100	57.7		ug/L		58	32 - 130	0	50
bis (2-chloroisopropyl) ether	100	52.4		ug/L		52	26 - 130	2	50
Bis(2-ethylhexyl) phthalate	100	81.9		ug/L		82	45 - 130	7	50
4-Bromophenyl phenyl ether	100	70.7		ug/L		71	47 - 130	15	50
Butyl benzyl phthalate	100	78.7		ug/L		79	50 - 130	3	50
Caprolactam	100	64.7		ug/L		65	26 - 130	48	50
Carbazole	100	79.4		ug/L		79	54 - 130	2	50
4-Chloroaniline	100	58.6		ug/L		59	42 - 130	23	50
4-Chloro-3-methylphenol	100	77.9		ug/L		78	47 - 130	2	50
2-Chloronaphthalene	100	65.1		ug/L		65	44 - 130	11	50
2-Chlorophenol	100	57.3		ug/L		57	39 - 130	2	50
4-Chlorophenyl phenyl ether	100	68.0		ug/L		68	45 - 130	6	50
Chrysene	100	75.6		ug/L		76	47 - 130	2	50
Dibenz(a,h)anthracene	100	74.4		ug/L		74	41 - 130	7	50
Dibenzofuran	100	67.6		ug/L		68	50 - 130	7	50
1,2-Dichlorobenzene	100	52.9		ug/L		53	31 - 130	3	50
1,3-Dichlorobenzene	100	51.0		ug/L		51	30 - 130	2	50
1,4-Dichlorobenzene	100	53.0		ug/L		53	31 - 130	3	50
3,3'-Dichlorobenzidine	100	65.6		ug/L		66	46 - 130	4	50
2,4-Dichlorophenol	100	72.4		ug/L		72	44 - 130	2	50
Diethyl phthalate	100	84.2		ug/L		84	53 - 130	2	50
2,4-Dimethylphenol	100	55.0		ug/L		55	37 - 130	5	50
Dimethyl phthalate	100	78.6		ug/L		79	53 - 130	3	50
Di-n-butyl phthalate	100	82.8		ug/L		83	51 - 130	5	50
4,6-Dinitro-2-methylphenol	200	191		ug/L		96	42 - 130	1	50
2,4-Dinitrophenol	200	177		ug/L		88	31 - 130	3	50
2,4-Dinitrotoluene	100	81.6		ug/L		82	52 - 130	2	50
2,6-Dinitrotoluene	100	78.7		ug/L		79	52 - 130	1	50
Di-n-octyl phthalate	100	78.3		ug/L		78	42 - 130	6	50
Fluoranthene	100	80.3		ug/L		80	47 - 130	7	50
Fluorene	100	69.5		ug/L		69	50 - 130	4	50
Hexachlorobenzene	100	70.5		ug/L		71	43 - 130	9	50
Hexachlorobutadiene	100	57.5		ug/L		58	27 - 130	2	50
Hexachlorocyclopentadiene	100	18.5		ug/L		18	11 - 130	13	50
Hexachloroethane	100	50.8		ug/L		51	29 - 130	3	50
Indeno[1,2,3-cd]pyrene	100	76.6		ug/L		77	31 - 130	7	50
Isophorone	100	70.7		ug/L		71	47 - 130	4	50
2-Methylnaphthalene	100	63.8		ug/L		64	40 - 130	6	50
2-Methylphenol	100	62.9		ug/L		63	40 - 130	4	50
3 & 4 Methylphenol	100	62.5		ug/L		62	42 - 130	5	50
2-Nitroaniline	100	81.5		ug/L		82	51 - 130	2	50
3-Nitroaniline	100	74.0		ug/L		74	53 - 130	11	50
4-Nitroaniline	100	64.9		ug/L		65	49 - 130	1	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-565543/8-A
Matrix: Water
Analysis Batch: 565809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 565543

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrobenzene			100	63.7		ug/L		64	43 - 130	1	50
2-Nitrophenol			100	64.9		ug/L		65	43 - 130	0	50
4-Nitrophenol			200	185		ug/L		92	44 - 130	20	50
N-Nitrosodi-n-propylamine			100	66.3		ug/L		66	42 - 130	5	50
N-Nitrosodiphenylamine			100	74.1		ug/L		74	50 - 130	1	50
Pentachlorophenol			200	186		ug/L		93	33 - 130	7	50
Phenanthrene			100	74.6		ug/L		75	51 - 130	10	50
Phenol			100	51.2		ug/L		51	35 - 130	14	50
Pyrene			100	77.8		ug/L		78	52 - 130	4	50
1,2,4-Trichlorobenzene			100	58.0		ug/L		58	33 - 130	4	50
2,4,5-Trichlorophenol			100	78.5		ug/L		79	48 - 130	2	50
2,4,6-Trichlorophenol			100	76.2		ug/L		76	47 - 130	4	50

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl	*58*		*32 - 113*
2-Fluorophenol	*51*		*26 - 109*
Nitrobenzene-d5	*60*		*32 - 118*
Phenol-d5	*53*		*27 - 110*
Terphenyl-d14	*62*		*10 - 126*
2,4,6-Tribromophenol	*74*		*39 - 124*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 460-600045/1-A
Matrix: Water
Analysis Batch: 600192

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 600045

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		04/03/19 09:50	04/03/19 19:48	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 19:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*91*		*38 - 125*	*04/03/19 09:50*	*04/03/19 19:48*	*1*
Terphenyl-d14	*76*		*70 - 130*	*04/03/19 09:50*	*04/03/19 19:48*	*1*

Lab Sample ID: LCS 460-600045/2-A
Matrix: Water
Analysis Batch: 600192

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 600045

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane			0.800	0.343	J	ug/L		43	10 - 137
Naphthalene			0.800	0.659		ug/L		82	24 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*92*		*38 - 125*
Terphenyl-d14	*82*		*70 - 130*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 460-600045/3-A
Matrix: Water
Analysis Batch: 600192

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 600045

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			0.800	<0.40	*	ug/L		19	10 - 137	79	30
Naphthalene			0.800	0.718		ug/L		90	24 - 124	9	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5	*92*		*38 - 125*
Terphenyl-d14	*84*		*70 - 130*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-566006/33
Matrix: Water
Analysis Batch: 566006

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/11/19 17:45	1

Lab Sample ID: LCS 680-566006/34
Matrix: Water
Analysis Batch: 566006

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			10.0	9.91		mg/L		99	90 - 110		

Lab Sample ID: LCSD 680-566006/35
Matrix: Water
Analysis Batch: 566006

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate			10.0	9.95		mg/L		100	90 - 110	0	15

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 550-174687/4
Matrix: Water
Analysis Batch: 174687

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/10/19 18:39	1

Lab Sample ID: LCS 550-174687/10
Matrix: Water
Analysis Batch: 174687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perchlorate			25.0	24.0		ug/L		96	85 - 115		

Method: 314.0 - Perchlorate (IC) (Continued)

Lab Sample ID: LCSD 550-174687/12
Matrix: Water
Analysis Batch: 174687

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate			25.0	23.9		ug/L		96	85 - 115	0	15

Lab Sample ID: 680-166627-10 MS
Matrix: Water
Analysis Batch: 174687

Client Sample ID: DUP06 (032719)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	0.83	J	25.0	26.4		ug/L		102	80 - 120

Lab Sample ID: 680-166627-10 MSD
Matrix: Water
Analysis Batch: 174687

Client Sample ID: DUP06 (032719)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	0.83	J	25.0	26.5		ug/L		103	80 - 120	0	15

Lab Sample ID: MB 550-174962/16
Matrix: Water
Analysis Batch: 174962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/13/19 00:04	1

Lab Sample ID: LCS 550-174962/18
Matrix: Water
Analysis Batch: 174962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate			25.0	25.8		ug/L		103	85 - 115

Lab Sample ID: LCSD 550-174962/20
Matrix: Water
Analysis Batch: 174962

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate			25.0	25.2		ug/L		101	85 - 115	2	15

Lab Sample ID: 680-166627-3 MS
Matrix: Water
Analysis Batch: 174962

Client Sample ID: PW6D (032719)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perchlorate	57		250	328		ug/L		109	80 - 120

Lab Sample ID: 680-166627-3 MSD
Matrix: Water
Analysis Batch: 174962

Client Sample ID: PW6D (032719)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perchlorate	57		250	327		ug/L		108	80 - 120	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-565127/1-A
Matrix: Water
Analysis Batch: 566003

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 565127

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<200		200	24	ug/L		04/04/19 13:37	04/10/19 21:11	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:11	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:11	1
Barium	<10		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:11	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:11	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:11	1
Calcium	<500		500	25	ug/L		04/04/19 13:37	04/10/19 21:11	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:11	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:11	1
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:11	1
Dissolved Iron	<50		50	17	ug/L		04/04/19 13:37	04/10/19 21:11	1
Iron	<50		50	17	ug/L		04/04/19 13:37	04/10/19 21:11	1
Lead	<10		10	3.9	ug/L		04/04/19 13:37	04/10/19 21:11	1
Magnesium	<500		500	33	ug/L		04/04/19 13:37	04/10/19 21:11	1
Manganese	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:11	1
Nickel	<40		40	2.1	ug/L		04/04/19 13:37	04/10/19 21:11	1
Potassium	<1000		1000	17	ug/L		04/04/19 13:37	04/10/19 21:11	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:11	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:11	1
Sodium	<1000		1000	480	ug/L		04/04/19 13:37	04/10/19 21:11	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:11	1
Vanadium	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:11	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:11	1

Lab Sample ID: LCS 680-565127/2-A
Matrix: Water
Analysis Batch: 566003

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 565127

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	4740		ug/L		95	80 - 120
Antimony	50.0	50.2		ug/L		100	80 - 120
Arsenic	100	102		ug/L		102	80 - 120
Barium	100	98.2		ug/L		98	80 - 120
Beryllium	50.0	50.2		ug/L		100	80 - 120
Cadmium	50.0	49.5		ug/L		99	80 - 120
Calcium	5000	4740		ug/L		95	80 - 120
Chromium	100	97.7		ug/L		98	80 - 120
Cobalt	50.0	48.9		ug/L		98	80 - 120
Copper	100	96.0		ug/L		96	80 - 120
Dissolved Iron	5000	4810		ug/L		96	80 - 120
Iron	5000	4810		ug/L		96	80 - 120
Lead	500	486		ug/L		97	80 - 120
Magnesium	5000	4770		ug/L		95	80 - 120
Manganese	500	479		ug/L		96	80 - 120
Nickel	100	96.8		ug/L		97	80 - 120
Potassium	8000	7520		ug/L		94	80 - 120
Selenium	100	103		ug/L		103	80 - 120
Silver	50.0	49.2		ug/L		98	80 - 120
Sodium	5000	4860		ug/L		97	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-565127/2-A
Matrix: Water
Analysis Batch: 566003

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 565127

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	40.0	36.6		ug/L		91	80 - 120
Vanadium	100	97.2		ug/L		97	80 - 120
Zinc	100	98.5		ug/L		99	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-565935/13-A
Matrix: Water
Analysis Batch: 566140

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 565935

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0896	J	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 18:16	1

Lab Sample ID: LCS 680-565935/14-A
Matrix: Water
Analysis Batch: 566140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 565935

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.58		ug/L		103	80 - 120

Method: 5310 B-2011 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-566297/2
Matrix: Water
Analysis Batch: 566297

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/13/19 20:07	1

Lab Sample ID: LCS 680-566297/3
Matrix: Water
Analysis Batch: 566297

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.7		mg/L		98	80 - 120

Lab Sample ID: LCSD 680-566297/4
Matrix: Water
Analysis Batch: 566297

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	19.7		mg/L		98	80 - 120	0	25

GC/MS VOA

Analysis Batch: 565538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-9	SW1C (032719)	Total/NA	Water	8260B	
MB 680-565538/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565538/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565538/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-1	SW7B (032719)	Total/NA	Water	8260B	
680-166627-2	SW6D (032719)	Total/NA	Water	8260B	
680-166627-3	PW6D (032719)	Total/NA	Water	8260B	
680-166627-4	SW6C (032719)	Total/NA	Water	8260B	
680-166627-5	PW6C (032719)	Total/NA	Water	8260B	
680-166627-6	SW6B (032719)	Total/NA	Water	8260B	
680-166627-7	PW2B (032719)	Total/NA	Water	8260B	
680-166627-8	SW2B (032719)	Total/NA	Water	8260B	
MB 680-565539/8	Method Blank	Total/NA	Water	8260B	
LCS 680-565539/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565539/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-10	DUP06 (032719)	Total/NA	Water	8260B	
680-166627-11	EB-03 (032719)	Total/NA	Water	8260B	
680-166627-12	Trip Blank	Total/NA	Water	8260B	
MB 680-565669/10	Method Blank	Total/NA	Water	8260B	
LCS 680-565669/7	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565669/31	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 565693

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-5 - DL	PW6C (032719)	Total/NA	Water	8260B	
MB 680-565693/9	Method Blank	Total/NA	Water	8260B	
LCS 680-565693/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-565693/4	Lab Control Sample Dup	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 564685

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-7	PW2B (032719)	Total/NA	Water	3520C	
680-166627-8	SW2B (032719)	Total/NA	Water	3520C	
680-166627-9	SW1C (032719)	Total/NA	Water	3520C	
680-166627-10	DUP06 (032719)	Total/NA	Water	3520C	
MB 680-564685/8-A	Method Blank	Total/NA	Water	3520C	
LCS 680-564685/9-A	Lab Control Sample	Total/NA	Water	3520C	
680-166627-7 MS	PW2B (032719)	Total/NA	Water	3520C	
680-166627-7 MSD	PW2B (032719)	Total/NA	Water	3520C	

Analysis Batch: 564905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-7	PW2B (032719)	Total/NA	Water	8270D	564685

GC/MS Semi VOA (Continued)

Analysis Batch: 564905 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-8	SW2B (032719)	Total/NA	Water	8270D	564685
680-166627-9	SW1C (032719)	Total/NA	Water	8270D	564685
680-166627-10	DUP06 (032719)	Total/NA	Water	8270D	564685
MB 680-564685/8-A	Method Blank	Total/NA	Water	8270D	564685
LCS 680-564685/9-A	Lab Control Sample	Total/NA	Water	8270D	564685
680-166627-7 MS	PW2B (032719)	Total/NA	Water	8270D	564685
680-166627-7 MSD	PW2B (032719)	Total/NA	Water	8270D	564685

Prep Batch: 565543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-8 - RE	SW2B (032719)	Total/NA	Water	3520C	
680-166627-9 - RE	SW1C (032719)	Total/NA	Water	3520C	
680-166627-10 - RE	DUP06 (032719)	Total/NA	Water	3520C	
MB 680-565543/6-A	Method Blank	Total/NA	Water	3520C	
LCS 680-565543/7-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 680-565543/8-A	Lab Control Sample Dup	Total/NA	Water	3520C	

Analysis Batch: 565809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-8 - RE	SW2B (032719)	Total/NA	Water	8270D	565543
680-166627-9 - RE	SW1C (032719)	Total/NA	Water	8270D	565543
680-166627-10 - RE	DUP06 (032719)	Total/NA	Water	8270D	565543
MB 680-565543/6-A	Method Blank	Total/NA	Water	8270D	565543
LCS 680-565543/7-A	Lab Control Sample	Total/NA	Water	8270D	565543
LCSD 680-565543/8-A	Lab Control Sample Dup	Total/NA	Water	8270D	565543

Prep Batch: 600045

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-1	SW7B (032719)	Total/NA	Water	3510C	
680-166627-2	SW6D (032719)	Total/NA	Water	3510C	
680-166627-3	PW6D (032719)	Total/NA	Water	3510C	
680-166627-4	SW6C (032719)	Total/NA	Water	3510C	
680-166627-5	PW6C (032719)	Total/NA	Water	3510C	
680-166627-6	SW6B (032719)	Total/NA	Water	3510C	
680-166627-11	EB-03 (032719)	Total/NA	Water	3510C	
MB 460-600045/1-A	Method Blank	Total/NA	Water	3510C	
LCS 460-600045/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 460-600045/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 600192

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-1	SW7B (032719)	Total/NA	Water	8270D SIM	600045
680-166627-2	SW6D (032719)	Total/NA	Water	8270D SIM	600045
680-166627-3	PW6D (032719)	Total/NA	Water	8270D SIM	600045
680-166627-4	SW6C (032719)	Total/NA	Water	8270D SIM	600045
680-166627-5	PW6C (032719)	Total/NA	Water	8270D SIM	600045
680-166627-6	SW6B (032719)	Total/NA	Water	8270D SIM	600045
680-166627-11	EB-03 (032719)	Total/NA	Water	8270D SIM	600045
MB 460-600045/1-A	Method Blank	Total/NA	Water	8270D SIM	600045
LCS 460-600045/2-A	Lab Control Sample	Total/NA	Water	8270D SIM	600045
LCSD 460-600045/3-A	Lab Control Sample Dup	Total/NA	Water	8270D SIM	600045

HPLC/IC

Analysis Batch: 174687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-1	SW7B (032719)	Total/NA	Water	314.0	
680-166627-2	SW6D (032719)	Total/NA	Water	314.0	
680-166627-4	SW6C (032719)	Total/NA	Water	314.0	
680-166627-5	PW6C (032719)	Total/NA	Water	314.0	
680-166627-6	SW6B (032719)	Total/NA	Water	314.0	
680-166627-7	PW2B (032719)	Total/NA	Water	314.0	
680-166627-8	SW2B (032719)	Total/NA	Water	314.0	
680-166627-9	SW1C (032719)	Total/NA	Water	314.0	
680-166627-10	DUP06 (032719)	Total/NA	Water	314.0	
680-166627-11	EB-03 (032719)	Total/NA	Water	314.0	
MB 550-174687/4	Method Blank	Total/NA	Water	314.0	
LCS 550-174687/10	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-174687/12	Lab Control Sample Dup	Total/NA	Water	314.0	
680-166627-10 MS	DUP06 (032719)	Total/NA	Water	314.0	
680-166627-10 MSD	DUP06 (032719)	Total/NA	Water	314.0	

Analysis Batch: 174962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-3	PW6D (032719)	Total/NA	Water	314.0	
MB 550-174962/16	Method Blank	Total/NA	Water	314.0	
LCS 550-174962/18	Lab Control Sample	Total/NA	Water	314.0	
LCSD 550-174962/20	Lab Control Sample Dup	Total/NA	Water	314.0	
680-166627-3 MS	PW6D (032719)	Total/NA	Water	314.0	
680-166627-3 MSD	PW6D (032719)	Total/NA	Water	314.0	

Analysis Batch: 566006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-3	PW6D (032719)	Total/NA	Water	300.0-1993 R2.1	
680-166627-5	PW6C (032719)	Total/NA	Water	300.0-1993 R2.1	
680-166627-7	PW2B (032719)	Total/NA	Water	300.0-1993 R2.1	
MB 680-566006/33	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-566006/34	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-566006/35	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Prep Batch: 565127

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-3	PW6D (032719)	Dissolved	Water	3005A	
680-166627-5	PW6C (032719)	Dissolved	Water	3005A	
680-166627-7	PW2B (032719)	Dissolved	Water	3005A	
680-166627-7	PW2B (032719)	Total Recoverable	Water	3005A	
680-166627-8	SW2B (032719)	Total Recoverable	Water	3005A	
680-166627-9	SW1C (032719)	Total Recoverable	Water	3005A	
680-166627-10	DUP06 (032719)	Total Recoverable	Water	3005A	
MB 680-565127/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-565127/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 565935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-7	PW2B (032719)	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 565935 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-8	SW2B (032719)	Total/NA	Water	7470A	
680-166627-9	SW1C (032719)	Total/NA	Water	7470A	
680-166627-10	DUP06 (032719)	Total/NA	Water	7470A	
MB 680-565935/13-A	Method Blank	Total/NA	Water	7470A	
LCS 680-565935/14-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 566003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-3	PW6D (032719)	Dissolved	Water	6010C	565127
680-166627-5	PW6C (032719)	Dissolved	Water	6010C	565127
680-166627-7	PW2B (032719)	Dissolved	Water	6010C	565127
680-166627-7	PW2B (032719)	Total Recoverable	Water	6010C	565127
680-166627-8	SW2B (032719)	Total Recoverable	Water	6010C	565127
680-166627-9	SW1C (032719)	Total Recoverable	Water	6010C	565127
680-166627-10	DUP06 (032719)	Total Recoverable	Water	6010C	565127
MB 680-565127/1-A	Method Blank	Total Recoverable	Water	6010C	565127
LCS 680-565127/2-A	Lab Control Sample	Total Recoverable	Water	6010C	565127

Analysis Batch: 566140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-7	PW2B (032719)	Total/NA	Water	7470A	565935
680-166627-8	SW2B (032719)	Total/NA	Water	7470A	565935
680-166627-9	SW1C (032719)	Total/NA	Water	7470A	565935
680-166627-10	DUP06 (032719)	Total/NA	Water	7470A	565935
MB 680-565935/13-A	Method Blank	Total/NA	Water	7470A	565935
LCS 680-565935/14-A	Lab Control Sample	Total/NA	Water	7470A	565935

General Chemistry

Analysis Batch: 566297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-166627-3	PW6D (032719)	Total/NA	Water	5310 B-2011	
680-166627-5	PW6C (032719)	Total/NA	Water	5310 B-2011	
680-166627-7	PW2B (032719)	Total/NA	Water	5310 B-2011	
MB 680-566297/2	Method Blank	Total/NA	Water	5310 B-2011	
LCS 680-566297/3	Lab Control Sample	Total/NA	Water	5310 B-2011	
LCSD 680-566297/4	Lab Control Sample Dup	Total/NA	Water	5310 B-2011	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW7B (032719)

Lab Sample ID: 680-166627-1

Date Collected: 03/27/19 12:00

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 17:09	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 21:57	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174687	04/10/19 23:14	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: SW6D (032719)

Lab Sample ID: 680-166627-2

Date Collected: 03/27/19 11:30

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 17:37	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 22:18	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174687	04/10/19 23:37	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: PW6D (032719)

Lab Sample ID: 680-166627-3

Date Collected: 03/27/19 10:45

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 18:03	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 22:40	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	566006	04/11/19 20:17	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		10			174962	04/13/19 01:59	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Dissolved	Analysis	6010C		1			566003	04/10/19 22:08	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566297	04/13/19 21:46	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: SW6C (032719)

Lab Sample ID: 680-166627-4

Date Collected: 03/27/19 11:15

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 18:29	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 23:01	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174687	04/11/19 00:23	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: PW6C (032719)

Lab Sample ID: 680-166627-5

Date Collected: 03/27/19 10:30

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	DL	5	5 mL	5 mL	565693	04/10/19 12:47	UI	TAL SAV
	Instrument ID: CMSA2									
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 18:54	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 23:22	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	566006	04/11/19 20:30	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			174687	04/11/19 00:46	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Dissolved	Analysis	6010C		1			566003	04/10/19 21:50	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566297	04/13/19 22:03	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: SW6B (032719)

Lab Sample ID: 680-166627-6

Date Collected: 03/27/19 11:00

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 19:20	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/03/19 23:43	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174687	04/11/19 01:08	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: PW2B (032719)

Lab Sample ID: 680-166627-7

Date Collected: 03/27/19 09:00

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 19:46	Y1S	TAL SAV
	Instrument ID: CMSP2									
Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			1007.3 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Prep	3520C			1007.3 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564905	04/03/19 19:57	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	566006	04/11/19 20:43	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	314.0		1			174687	04/11/19 01:31	NEL	TAL PHX
	Instrument ID: IC4									
Dissolved	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Dissolved	Analysis	6010C		1			566003	04/10/19 22:04	BCB	TAL SAV
	Instrument ID: ICPE									
Total Recoverable	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1			566003	04/10/19 21:46	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	7470A			50 mL	50 mL	565935	04/11/19 10:21	PEP	TAL SAV
Total/NA	Analysis	7470A		1			566140	04/11/19 19:17	PEP	TAL SAV
	Instrument ID: LEEMAN2									
Total/NA	Analysis	5310 B-2011		1	40 mL	40 mL	566297	04/13/19 22:20	KDM	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: SW2B (032719)

Lab Sample ID: 680-166627-8

Date Collected: 03/27/19 09:10

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565539	04/09/19 20:11	Y1S	TAL SAV
	Instrument ID: CMSP2									
Total/NA	Prep	3520C			1013.4 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564905	04/03/19 20:21	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Prep	3520C	RE		1014.3 mL	1 mL	565543	04/09/19 15:03	WGG	TAL SAV
Total/NA	Analysis	8270D	RE	1			565809	04/10/19 22:49	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Analysis	314.0		1			174687	04/11/19 01:54	NEL	TAL PHX
	Instrument ID: IC4									
Total Recoverable	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1			566003	04/10/19 21:42	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	7470A			50 mL	50 mL	565935	04/11/19 10:21	PEP	TAL SAV
Total/NA	Analysis	7470A		1			566140	04/11/19 19:21	PEP	TAL SAV
	Instrument ID: LEEMAN2									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)

Lab Sample ID: 680-166627-9

Date Collected: 03/27/19 08:20

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565538	04/09/19 19:29	Y1S	TAL SAV
	Instrument ID: CMSB									
Prep Type	**Batch Type**	**Batch Method**	**Run**	**Dil Factor**	**Initial Amount**	**Final Amount**	**Batch Number**	**Prepared or Analyzed**	**Analyst**	**Lab**
Total/NA	Prep	3520C			1009.3 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Prep	3520C			1009.3 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564905	04/03/19 20:46	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Prep	3520C	RE		1025.2 mL	1 mL	565543	04/09/19 15:03	WGG	TAL SAV
Total/NA	Analysis	8270D	RE	1			565809	04/10/19 23:13	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Analysis	314.0		1			174687	04/11/19 02:17	NEL	TAL PHX
	Instrument ID: IC4									
Total Recoverable	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1			566003	04/10/19 21:33	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	7470A			50 mL	50 mL	565935	04/11/19 10:21	PEP	TAL SAV
Total/NA	Analysis	7470A		1			566140	04/11/19 19:25	PEP	TAL SAV
	Instrument ID: LEEMAN2									

Client Sample ID: DUP06 (032719)

Lab Sample ID: 680-166627-10

Date Collected: 03/27/19 08:00

Matrix: Water

Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565669	04/10/19 02:27	Y1S	TAL SAV
	Instrument ID: CMSB									
Total/NA	Prep	3520C			1029.7 mL	1 mL	564685	04/02/19 11:58	CEW	TAL SAV
Total/NA	Analysis	8270D		1			564905	04/03/19 21:11	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Prep	3520C	RE		1014.4 mL	1 mL	565543	04/09/19 15:03	WGG	TAL SAV
Total/NA	Analysis	8270D	RE	1			565809	04/10/19 23:38	OK	TAL SAV
	Instrument ID: CMST									
Total/NA	Analysis	314.0		1			174687	04/11/19 02:40	NEL	TAL PHX
	Instrument ID: IC4									
Total Recoverable	Prep	3005A			50 mL	50 mL	565127	04/04/19 13:37	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1			566003	04/10/19 21:37	BCB	TAL SAV
	Instrument ID: ICPE									
Total/NA	Prep	7470A			50 mL	50 mL	565935	04/11/19 10:21	PEP	TAL SAV
Total/NA	Analysis	7470A		1			566140	04/11/19 19:29	PEP	TAL SAV
	Instrument ID: LEEMAN2									

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: EB-03 (032719)

Lab Sample ID: 680-166627-11

Date Collected: 03/27/19 00:00
Matrix: Water
Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565669	04/10/19 02:04	Y1S	TAL SAV
	Instrument ID: CMSB									
Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Prep	3510C			250 mL	2 mL	600045	04/03/19 09:50	DXB	TAL EDI
Total/NA	Analysis	8270D SIM		1			600192	04/04/19 00:04	SK	TAL EDI
	Instrument ID: CBNAMS9									
Total/NA	Analysis	314.0		1			174687	04/11/19 04:35	NEL	TAL PHX
	Instrument ID: IC4									

Client Sample ID: Trip Blank

Lab Sample ID: 680-166627-12

Date Collected: 03/27/19 00:00
Matrix: Water
Date Received: 03/29/19 09:01

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	565669	04/10/19 01:18	Y1S	TAL SAV
	Instrument ID: CMSB									

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL PHX = Eurofins TestAmerica, Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Baltimore #201

Chain of Custody Record

309996

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zambito	Date: 3/27/19	COC No:
Company Name: Arcadis Inc	Tel/Fax:	Lab Contact: Jerry Lanier	Carrier:	1 of 1 COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler:
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital	☐ 1 week			
Site: Elkton, MD	☐ 2 days			Job / SDG No.:
PO # MD001006.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOCs	3140 - Perchlorate	8270D_Sim - Dioxane	SM5310_TOC_B	6010C - Dissolved Iron	300 - ORGFM_28D	8270D - SVOC	6010C - Total Metals	Sample Specific Notes:
SW7B(032719)	03/27/19	1200	G	W	6			3	1	2						
SW6D(032719)		1130	G	W	6			3	1	2						
PW6D(032719)		1045	G	W	11			3	1	2		3	1	1		
SW6C(032719)		1115	G	W	6			3	1	2						
PW6C(032719)		1030	G	W	11			3	1	2		3	1	1		
SW6B(032719)		1100	G	W	6			3	1	2						
PW2B(032719)		0900	G	W	12			3	1			3	1	1	2	1
SW2B(032719)		0910	G	W	7			3	1						2	1
SW1C(032719)		0820	G	W	7			3	1						2	1
DUP06(032719)		0800	G	W	7			3	1						2	1
EB-03(032719)		—	G	W	14			6	4	4						

680-166627 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 3 coolers 1.3/1.5, 2.5/3.0 CUI225

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:

	Company	Date/Time	Received by:	Company	Date/Time
Relinquished by:	Arcadis			TA	3/28/19 1610
Relinquished by:	TA 3/28/19	1700	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA STL	Date/Time: 3/29/19 901

4/18/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560008.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/10/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SW7B (032719) (680-166627-1)	3/27/19	12:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6D (032719) (680-166627-2)	3/27/19	11:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
PW6D (032719) (680-166627-3)	3/27/19	10:45 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6C (032719) (680-166627-4)	3/27/19	11:15 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
PW6C (032719) (680-166627-5)	3/27/19	10:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6B (032719) (680-166627-6)	3/27/19	11:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
EB-03 (032719) (680-166627-11)	3/27/19	Eastern		Water			X	4	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4.1.19 1521		[signature] via FedEx	4/2/19 0905	TAEsi
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: X Yes Δ No	Custody Seal No.: 700343	Cooler Temperature(s) °C and Other Remarks: 4.2°C IR9

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560047.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/10/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SW7B (032719) (680-166627-1)	3/27/19	12:00 Eastern		Water			X	1	
SW6D (032719) (680-166627-2)	3/27/19	11:30 Eastern		Water			X	1	
PW6D (032719) (680-166627-3)	3/27/19	10:45 Eastern		Water			X	1	
SW6C (032719) (680-166627-4)	3/27/19	11:15 Eastern		Water			X	1	
PW6C (032719) (680-166627-5)	3/27/19	10:30 Eastern		Water			X	1	
SW6B (032719) (680-166627-6)	3/27/19	11:00 Eastern		Water			X	1	
PW2B (032719) (680-166627-7)	3/27/19	09:00 Eastern		Water			X	1	
SW2B (032719) (680-166627-8)	3/27/19	09:10 Eastern		Water			X	1	
SW1C (032719) (680-166627-9)	3/27/19	08:20 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 4.2.19 0858	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: TA-PHX	Date/Time: 09:20	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 04-03-19	Company TA Phx

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		Temp 4.2-C

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560047.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/10/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DUP06 (032719) (680-166627-10)	3/27/19	08:00 Eastern		Water			X	1	
EB-03 (032719) (680-166627-11)	3/27/19	Eastern		Water			X	4	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		4.2.19 0858				
2				TA-PHX		
3					04-05-19 09:20	TA-PHX

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

4/18/2019

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166627-1

Login Number: 166627

List Source: Eurofins TestAmerica, Savannah

List Number: 1

Creator: Weston, Pamela

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166627-1

Login Number: 166627
List Number: 2
Creator: Armbruster, Chris

List Source: Eurofins TestAmerica, Edison
List Creation: 04/02/19 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	700343
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.2°C IR9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-166627-1

Login Number: 166627
List Number: 3
Creator: Doerr, Bret C

List Source: Eurofins TestAmerica, Phoenix
List Creation: 04/03/19 12:14 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Maryland	State Program	3	250	12-31-19

Laboratory: Eurofins TestAmerica, Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-19
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

Laboratory: Eurofins TestAmerica, Phoenix

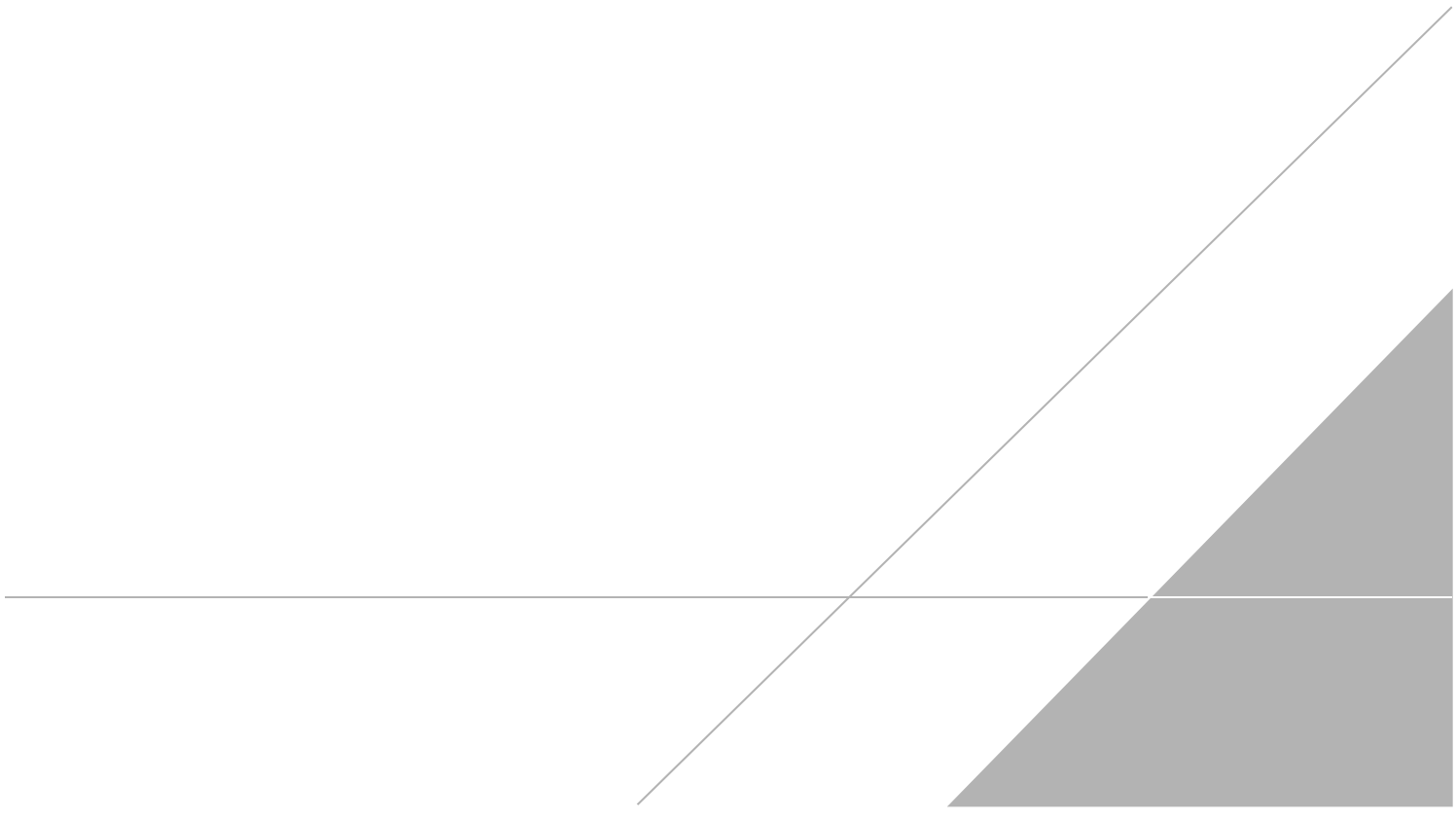
All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	ELLAP		154268	07-01-19
AIHA-LAP, LLC	IHLAP		154268	07-01-19
Arizona	State Program	9	AZ0728	06-09-19
California	LA Cty Sanitation Districts	9	9254471	04-10-19 *
California	State Program	9	2941	06-09-19
Nevada	State Program	9	AZ01030	07-31-19
Oregon	NELAP	10	AZ100001	03-09-20
USDA	Federal		P330-16-00302	08-27-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

APPENDIX D

Data Validation Reports



ARCADIS Design & Consultancy for natural and built assets

ATK – Elkton

DATA REVIEW

Elkton, MD

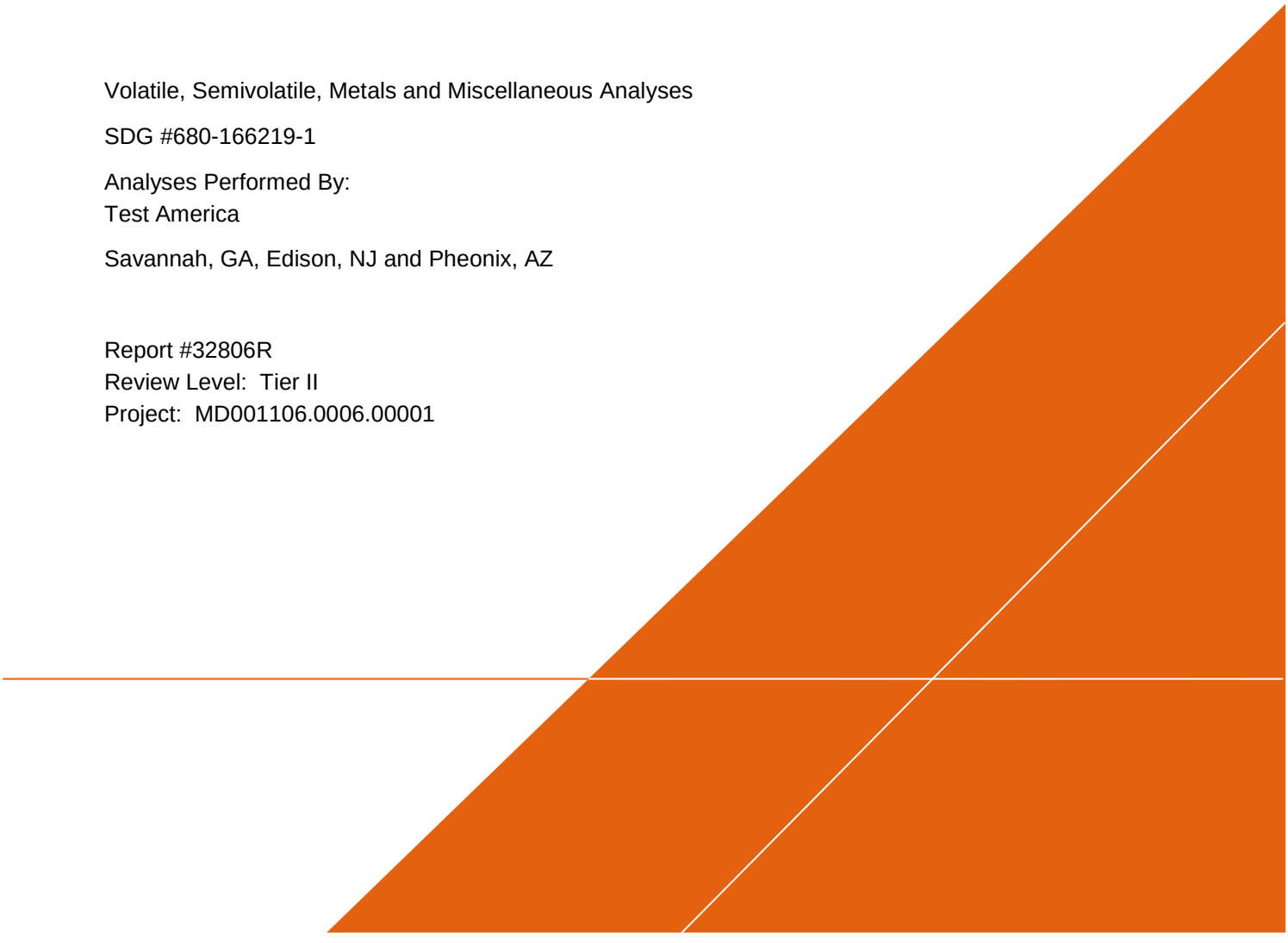
Volatile, Semivolatile, Metals and Miscellaneous Analyses

SDG #680-166219-1

Analyses Performed By:
Test America

Savannah, GA, Edison, NJ and Pheonix, AZ

Report #32806R
Review Level: Tier II
Project: MD001106.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #680-166219-1 for samples collected in association with the ATK Elkton site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
					VOC	SVOC	PCB	MET	MISC
GM-1B (031919)	680-166219-1	Water	3/19/2019		X	X		X	X
GM-4B (031919)	680-166219-2	Water	3/19/2019		X	X			X
GM-14M (031919)	680-166219-3	Water	3/19/2019		X	X		X	X
GM-14S (031919)	680-166219-4	Water	3/19/2019		X	X			X
GM-15M (031919)	680-166219-5	Water	3/19/2019		X				X
GM-24 (031919)	680-166219-6	Water	3/19/2019		X	X			X
DUP01 (031919)	680-166219-7	Water	3/19/2019	GM-15M (031919)	X				X
TB01 (031919)	680-166219-8	Water	3/19/2019		X				

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8270D (SIM). All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 1999. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Note: 2-Chloroethyl vinyl ether degrades in the presence of acid. Since the sample was preserved with acid to a pH of less than 2, the results for 2-chloroethyl vinyl ether were rejected.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
All field samples	Bromomethane	>UL	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Note:
Sample results were not qualified as rejected (R) due to the deviations listed above.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
GM-15M / DUP01	cis-1,2-Dichloroethane	0.67 J	0.56 J	AC
	1,2-Dichloroethene	0.67 J	0.56 J	AC
	MTBE	0.80 J	10 U	AC

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
	1,1,2,2-Tetrachloroethane	13	13	0%
	Tetrachloroethene	2.0	1.9	AC
	Trichloroethene	4.5	4.4	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. Compound Identification

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
GM-14M	Trichloroethene	--	270	270 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)	X				X
Matrix Spike Duplicate(MSD)	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not included in the data package.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010, 300.0, 314.0, and SM5310 B-2011. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 2004. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010	Water	180 days from collection to analysis	Preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Matrix Spike (MS) and Matrix Spike Duplicate(MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

A MS/MSD was not included in the data package.

3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

A laboratory duplicate was not included in the data package.

4 Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not included in the data package.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METAL

METALS; SW-846 6010/7470	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks	X				X
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Perchlorate by EPA 314.0	Water	28 days from collection to analysis	Cool to <6 °C.
Sulfate by EPA 300.0	Water	28 days from collection to analysis	Cool to <6 °C.
TOC by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved with H_2SO_4

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Matrix Spike (MS) and Matrix Spike Duplicate (MSD)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSDs performed on sample location GM-1B for perchlorate exhibited recoveries and RPDs within the control limits.

4.1 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
GM-15M / DUP01	Perchlorate	44	43	2.3%

Notes:

AC = Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA 314, 300 and SM5310B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R - percent recovery
RPD - relative percent difference,

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE:

DATE: May 20, 2019

PEER REVIEW: Joseph C. Houser

DATE: May 28, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Baltimore #201

Chain of Custody Record 309991

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zembito	Date: 3/19/19	COC No:
Company Name: Arcadis Inc	Tel/Fax: 410-987-0032	Lab Contact:	Carrier:	1 of 1 COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler: F. Morrison/A. Feild
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital/Alliant Tech	☐ 1 week			
Site: Elkton, MD	☐ 2 days			Job / SDG No.:
PO# MD001006.0005	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOC	6010C - Dissolved Iron	SM5310_TOC_B	3500CHEM_28D	8270D_SIM	314.0 - Perchlorate	Sample Specific Notes:
GM-1B(031919)	3/19/19	1530		GW	11			3	1	3	1	2	1	
GM-4B(031919)	3/19/19	1350		GW	6			3				2	1	
GM-14M(031919)	3/19/19	1055		GW	11			3	1	3	1	2	1	
GM-14S(031919)	3/19/19	~~0800~~ 1055 EMM		GW	6			3				2	1	
GM-15M(031919)	3/19/19	1355		GW	4			3					1	
GM-24(031919)	3/19/19	1620		GW	6			3				2	1	
DUP01(031919)	3/19/19	0800 EMM		GW	4			3					1	
TB01(031919)	~~3/19/19 0800~~				3			3						

680-166219 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	3/20/19	Received by:	TA	3/20/19 1200
Relinquished by:	Company: 3/20/19	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TASAV	Date/Time: 3/21/19 8:47

Page 52 of 58

4/4/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-558651.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166219-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/2/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-1B (031919) (680-166219-1)	3/19/19	15:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-4B (031919) (680-166219-2)	3/19/19	13:50 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-14M (031919) (680-166219-3)	3/19/19	10:55 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-14S (031919) (680-166219-4)	3/19/19	10:55 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
GM-24 (031919) (680-166219-6)	3/19/19	16:20 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3-21-19 1717		[signature] via FedEx	3/22/19 0900	DAE
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☑ Yes △ No	Custody Seal No.: 700276	Cooler Temperature(s) °C and Other Remarks: 4.2°C IR9

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-558652.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166219-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/2/2019	Analysis Requested		Preservation Codes:
City: Phoenix	TAT Requested (days):			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Elkton	Project #: 68012765			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
GM-1B (031919) (680-166219-1)	3/19/19	15:30 Eastern		Water			X	1	
GM-4B (031919) (680-166219-2)	3/19/19	13:50 Eastern		Water			X	1	
GM-14M (031919) (680-166219-3)	3/19/19	10:55 Eastern		Water			X	1	
GM-14S (031919) (680-166219-4)	3/19/19	10:55 Eastern		Water			X	1	
GM-15M (031919) (680-166219-5)	3/19/19	13:55 Eastern		Water			X	1	
GM-24 (031919) (680-166219-6)	3/19/19	16:20 Eastern		Water			X	1	
DUP01 (031919) (680-166219-7)	3/19/19	08:00 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3-21-19 1727				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 3-22-19 0900	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: (3.1°C) FED

Ver: 01/16/2019

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919)
Date Collected: 03/19/19 15:30
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 16:35	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 16:35	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 16:35	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 16:35	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 16:35	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 16:35	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 16:35	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 16:35	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
cis-1,2-Dichloroethene	**1.6**		1.0	0.41	ug/L			03/28/19 16:35	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 16:35	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 16:35	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 16:35	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 16:35	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 16:35	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 16:35	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 16:35	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 16:35	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
1,1-Dichloroethene	**1.8**		1.0	0.36	ug/L			03/28/19 16:35	1
1,2-Dichloroethene, Total	**1.6**	J	2.0	0.37	ug/L			03/28/19 16:35	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 16:35	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 16:35	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 16:35	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 16:35	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 16:35	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 16:35	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 16:35	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 16:35	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 16:35	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 16:35	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 16:35	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 16:35	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-1B (031919)
Date Collected: 03/19/19 15:30
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 16:35	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 16:35	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 16:35	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 16:35	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 16:35	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 16:35	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 16:35	1
Trichloroethene	**40**		1.0	0.48	ug/L			03/28/19 16:35	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 16:35	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 16:35	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 16:35	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 16:35	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 16:35	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 16:35	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/28/19 16:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 16:35*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/28/19 16:35*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 16:35*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.7**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 03:29	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 03:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*117*		*38 - 125*	*03/25/19 10:14*	*03/26/19 03:29*	*1*
Terphenyl-d14	*92*		*70 - 130*	*03/25/19 10:14*	*03/26/19 03:29*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**2.1**		1.0	0.40	mg/L			04/03/19 13:29	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**62**		10	2.8	ug/L			04/01/19 20:36	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/28/19 10:39	03/30/19 03:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.76**	**J**	1.0	0.50	mg/L			04/03/19 07:32	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-4B (031919)
Date Collected: 03/19/19 13:50
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:01	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:01	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 17:01	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:01	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:01	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:01	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 17:01	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:01	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:01	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 17:01	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:01	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:01	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:01	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:01	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:01	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:01	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:01	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 17:01	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 17:01	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 17:01	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:01	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:01	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:01	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:01	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:01	1
Methyl tert-butyl ether	**0.57**	**J**	10	0.30	ug/L			03/28/19 17:01	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:01	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:01	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:01	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:01	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:01	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:01	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:01	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-4B (031919)
Date Collected: 03/19/19 13:50
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:01	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:01	1
Tetrachloroethene	**1.4**		1.0	0.74	ug/L			03/28/19 17:01	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 17:01	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:01	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:01	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:01	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:01	1
Trichloroethene	**13**		1.0	0.48	ug/L			03/28/19 17:01	1
Trichlorofluoromethane	**0.46**	**J**	1.0	0.42	ug/L			03/28/19 17:01	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:01	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:01	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:01	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:01	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 17:01	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/28/19 17:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/28/19 17:01*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/28/19 17:01*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 17:01*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 03:50	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 03:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*110*		*38 - 125*	*03/25/19 10:14*	*03/26/19 03:50*	*1*
Terphenyl-d14	*83*		*70 - 130*	*03/25/19 10:14*	*03/26/19 03:50*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.4**		1.0	0.28	ug/L			03/29/19 04:08	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:26	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:26	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:26	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:26	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:26	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:26	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 17:26	1
Chloroform	**0.84**	**J**	1.0	0.50	ug/L			03/28/19 17:26	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:26	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:26	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
cis-1,2-Dichloroethene	**40**		1.0	0.41	ug/L			03/28/19 17:26	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:26	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:26	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:26	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:26	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:26	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:26	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:26	1
1,1-Dichloroethane	**5.1**		1.0	0.38	ug/L			03/28/19 17:26	1
1,2-Dichloroethane	**0.79**	**J**	1.0	0.50	ug/L			03/28/19 17:26	1
1,1-Dichloroethene	**28**		1.0	0.36	ug/L			03/28/19 17:26	1
1,2-Dichloroethene, Total	**41**		2.0	0.37	ug/L			03/28/19 17:26	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:26	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:26	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:26	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:26	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:26	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 17:26	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:26	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:26	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:26	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:26	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:26	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:26	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:26	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:26	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:26	1
Tetrachloroethene	**1.2**		1.0	0.74	ug/L			03/28/19 17:26	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 17:26	1
trans-1,2-Dichloroethene	**0.46**	**J**	1.0	0.37	ug/L			03/28/19 17:26	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:26	1
1,1,1-Trichloroethane	**4.5**		1.0	0.37	ug/L			03/28/19 17:26	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:26	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 17:26	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:26	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:26	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:26	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:26	1
Vinyl chloride	**6.4**		1.0	0.50	ug/L			03/28/19 17:26	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 17:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 17:26*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 17:26*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 17:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**270**	D	2.0	0.96	ug/L			03/29/19 13:16	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/29/19 13:16*	*2*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*03/29/19 13:16*	*2*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*03/29/19 13:16*	*2*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/29/19 13:16*	*2*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4.7**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:12	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*115*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:12*	*1*
Terphenyl-d14	*92*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:12*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**8.5**		1.0	0.40	mg/L			04/03/19 13:42	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**96**		10	2.8	ug/L			04/01/19 22:08	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14M (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	130		50	17	ug/L		03/28/19 10:39	03/30/19 03:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.2		1.0	0.50	mg/L			04/03/19 07:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14S (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 17:52	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 17:52	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 17:52	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 17:52	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 17:52	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 17:52	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 17:52	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 17:52	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 17:52	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 17:52	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
cis-1,2-Dichloroethene	**86**		1.0	0.41	ug/L			03/28/19 17:52	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 17:52	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 17:52	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 17:52	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 17:52	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 17:52	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 17:52	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 17:52	1
1,1-Dichloroethane	**9.2**		1.0	0.38	ug/L			03/28/19 17:52	1
1,2-Dichloroethane	**2.7**		1.0	0.50	ug/L			03/28/19 17:52	1
1,1-Dichloroethene	**27**		1.0	0.36	ug/L			03/28/19 17:52	1
1,2-Dichloroethene, Total	**86**		2.0	0.37	ug/L			03/28/19 17:52	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 17:52	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 17:52	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 17:52	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 17:52	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 17:52	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 17:52	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 17:52	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:52	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 17:52	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 17:52	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 17:52	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 17:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-14S (031919)
Date Collected: 03/19/19 10:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 17:52	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 17:52	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 17:52	1
Toluene	**5.8**		1.0	0.48	ug/L			03/28/19 17:52	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 17:52	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 17:52	1
1,1,1-Trichloroethane	**1.6**		1.0	0.37	ug/L			03/28/19 17:52	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 17:52	1
Trichloroethene	**8.4**		1.0	0.48	ug/L			03/28/19 17:52	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 17:52	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 17:52	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 17:52	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 17:52	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 17:52	1
Vinyl chloride	**13**		1.0	0.50	ug/L			03/28/19 17:52	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 17:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*		*03/28/19 17:52*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*03/28/19 17:52*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 17:52*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**9.8**		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:33	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:33*	*1*
Terphenyl-d14	*80*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:33*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			03/29/19 04:54	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-15M (031919)
Date Collected: 03/19/19 13:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 18:18	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 18:18	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 18:18	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 18:18	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 18:18	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 18:18	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 18:18	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 18:18	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
cis-1,2-Dichloroethene	**0.67**	**J**	1.0	0.41	ug/L			03/28/19 18:18	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 18:18	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 18:18	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 18:18	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 18:18	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 18:18	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 18:18	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 18:18	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 18:18	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 18:18	1
1,2-Dichloroethene, Total	**0.67**	**J**	2.0	0.37	ug/L			03/28/19 18:18	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 18:18	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 18:18	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 18:18	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 18:18	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 18:18	1
Methyl tert-butyl ether	**0.80**	**J**	10	0.30	ug/L			03/28/19 18:18	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 18:18	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:18	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 18:18	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 18:18	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 18:18	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 18:18	1

Client Sample ID: GM-15M (031919)
Date Collected: 03/19/19 13:55
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 18:18	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1,2,2-Tetrachloroethane	**13**		1.0	0.62	ug/L			03/28/19 18:18	1
Tetrachloroethene	**2.0**		1.0	0.74	ug/L			03/28/19 18:18	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 18:18	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:18	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:18	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 18:18	1
Trichloroethene	**4.5**		1.0	0.48	ug/L			03/28/19 18:18	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 18:18	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 18:18	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:18	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 18:18	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 18:18	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 18:18	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 18:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/28/19 18:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 18:18*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 18:18*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 18:18*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**44**		1.0	0.28	ug/L			03/29/19 05:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-24 (031919)
Date Collected: 03/19/19 16:20
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 14:52	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 14:52	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 14:52	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 14:52	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 14:52	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 14:52	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 14:52	1
Chloroform	**0.75**	**J**	1.0	0.50	ug/L			03/28/19 14:52	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 14:52	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 14:52	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 14:52	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 14:52	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 14:52	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 14:52	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 14:52	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 14:52	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 14:52	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 14:52	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 14:52	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
1,1-Dichloroethene	**2.0**		1.0	0.36	ug/L			03/28/19 14:52	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 14:52	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 14:52	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 14:52	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 14:52	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 14:52	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 14:52	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 14:52	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 14:52	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 14:52	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 14:52	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 14:52	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 14:52	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 14:52	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: GM-24 (031919)
Date Collected: 03/19/19 16:20
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 14:52	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 14:52	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 14:52	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 14:52	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 14:52	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 14:52	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 14:52	1
Trichloroethene	**20**		1.0	0.48	ug/L			03/28/19 14:52	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 14:52	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 14:52	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 14:52	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 14:52	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 14:52	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 14:52	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/28/19 14:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/28/19 14:52*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 14:52*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/28/19 14:52*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/25/19 10:14	03/26/19 04:55	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/25/19 10:14	03/26/19 04:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*94*		*38 - 125*	*03/25/19 10:14*	*03/26/19 04:55*	*1*
Terphenyl-d14	*73*		*70 - 130*	*03/25/19 10:14*	*03/26/19 04:55*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**130**		10	2.8	ug/L			04/01/19 22:31	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: DUP01 (031919)
Date Collected: 03/19/19 08:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 18:44	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 18:44	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			03/28/19 18:44	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 18:44	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 18:44	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 18:44	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 18:44	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 18:44	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 18:44	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
cis-1,2-Dichloroethene	**0.56**	**J**	1.0	0.41	ug/L			03/28/19 18:44	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 18:44	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 18:44	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 18:44	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 18:44	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 18:44	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 18:44	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 18:44	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 18:44	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 18:44	1
1,2-Dichloroethene, Total	**0.56**	**J**	2.0	0.37	ug/L			03/28/19 18:44	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 18:44	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 18:44	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 18:44	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 18:44	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 18:44	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 18:44	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 18:44	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:44	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 18:44	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 18:44	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 18:44	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 18:44	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: DUP01 (031919)
Date Collected: 03/19/19 08:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 18:44	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1,2,2-Tetrachloroethane	**13**		1.0	0.62	ug/L			03/28/19 18:44	1
Tetrachloroethene	**1.9**		1.0	0.74	ug/L			03/28/19 18:44	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 18:44	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 18:44	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 18:44	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 18:44	1
Trichloroethene	**4.4**		1.0	0.48	ug/L			03/28/19 18:44	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 18:44	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 18:44	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 18:44	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 18:44	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 18:44	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 18:44	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/28/19 18:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/28/19 18:44*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/28/19 18:44*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/28/19 18:44*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**43**		1.0	0.28	ug/L			03/29/19 06:02	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

TestAmerica Job ID: 680-166219-1

Client Sample ID: TB01 (031919)
Date Collected: 03/19/19 00:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/28/19 11:22	1
Benzene	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/28/19 11:22	1
Bromoform	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Butanone	<10		10	3.4	ug/L			03/28/19 11:22	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/28/19 11:22	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/28/19 11:22	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/28/19 11:22	1
Chloroform	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/28/19 11:22	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/28/19 11:22	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/28/19 11:22	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/28/19 11:22	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/28/19 11:22	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/28/19 11:22	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/28/19 11:22	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/28/19 11:22	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/28/19 11:22	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/28/19 11:22	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/28/19 11:22	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/28/19 11:22	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/28/19 11:22	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/28/19 11:22	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/28/19 11:22	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/28/19 11:22	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
2-Hexanone	<10		10	2.0	ug/L			03/28/19 11:22	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/28/19 11:22	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/28/19 11:22	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/28/19 11:22	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:22	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/28/19 11:22	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/28/19 11:22	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
Styrene	<1.0		1.0	0.27	ug/L			03/28/19 11:22	1

Client Sample ID: TB01 (031919)
Date Collected: 03/19/19 00:00
Date Received: 03/21/19 08:47

Lab Sample ID: 680-166219-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/28/19 11:22	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/28/19 11:22	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/28/19 11:22	1
Toluene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/28/19 11:22	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/28/19 11:22	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/28/19 11:22	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/28/19 11:22	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/28/19 11:22	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/28/19 11:22	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/28/19 11:22	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/28/19 11:22	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/28/19 11:22	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/28/19 11:22	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/28/19 11:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/28/19 11:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/28/19 11:22*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 122*		*03/28/19 11:22*	*1*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*03/28/19 11:22*	*1*

ARCADIS Design & Consultancy for natural and built assets

ATK – Elkton

DATA REVIEW

Elkton, MD

Volatile, Semivolatile, Metals and Miscellaneous Analyses

SDG #680-166366-1

Analyses Performed By:
Test America

Savannah, GA, Edison, NJ and Pheonix, AZ

Report #32807R
Review Level: Tier II
Project: MD001106.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #680-166366-1 for samples collected in association with the ATK Elkton site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
					VOC	SVOC	PCB	MET	MISC
GM-9M (032019)	680-166366-1	Water	3/20/2019		X	X			X
GM-10S (032019)	680-166366-2	Water	3/20/2019		X	X		X	X
MW-1 (032019)	680-166366-3	Water	3/20/2019		X				X
MW-2 (032019)	680-166366-4	Water	3/20/2019		X	X		X	X
MW-10 (032019)	680-166366-5	Water	3/20/2019		X				X
MW-12 (032019)	680-166366-6	Water	3/20/2019		X			X	X
MW-13 (032019)	680-166366-7	Water	3/20/2019		X				X
MW-20 (032019)	680-166366-8	Water	3/20/2019		X				X
MW-22 (032019)	680-166366-9	Water	3/20/2019		X			X	X
DUP-02 (032019)	680-166366-10	Water	3/20/2019	MW-2 (032019)	X			X	X
GM-27 (032119)	680-166366-11	Water	3/21/2019		X	X			X
TB-02(03202019)	680-166366-12	Water	3/20/2019		X				
EB-01 (032119)	680-166366-13	Water	3/21/2019		X	X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B, 8270D and 8270D (SIM). All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 1999. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines. The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.

Note:

s.u. Standard units

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
MW-2	15 days	<14 days

Sample results associated with sample locations analyzed by analytical method SW-846 8260 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Note: 2-Chloroethyl vinyl ether degrades in the presence of acid. Since the sample was preserved with acid to a pH of less than 2, the results for 2-chloroethyl vinyl ether were rejected.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
GM-9M GM-10S MW-1 MW-10 MW-12 MW-20 MW-22 DUP-02 GM-27 TB-02 EB-01 MW-2	Bromomethane	>UL	>UL
MW-13	sec-Butylbenzene	AC	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Note:
Sample results were not qualified as rejected (R) due to the deviations listed above.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-2 / DUP-02	1,1-Dichloroethane	2.9	3.5	AC
	1,1,1-Trichloroethane	37	47	23.8%

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks		X	X		
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)	X				X
Matrix Spike Duplicate(MSD)	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not included in the data package.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010, 7470A, 300.0, 314.0, 353.2, 351.2 and SM5310 B-2011. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 2004. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010	Water	180 days from collection to analysis	Preserved to a pH of less than 2.
SW-846 7470	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were detected in the associated QA blanks; however, the only associated sample results were equipment blank results.

3. Matrix Spike (MS) and Matrix Spike Duplicate(MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

A MS/MSD was not included in the data package.

3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

A laboratory duplicate was not included in the data package.

4 Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-2 / DUP-02	Iron, Dissolved	18 J	50 U	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All LCS recoveries were within the control limits.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METAL

METALS; SW-846 6010/7470	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X	X		
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Perchlorate by EPA 314.0	Water	28 days from collection to analysis	Cool to <6 °C.
Sulfate by EPA 300.0	Water	28 days from collection to analysis	Cool to <6 °C.
TOC by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved with H_2SO_4
EPA 351.2 (TKN)	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.
Nitrate/Nitrite by EPA 353.2	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Matrix Spike (MS) and Matrix Spike Duplicate (MSD)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD performed on sample location GM-10S for sulfate exhibited recoveries and RPDs within the control limits.

The MS/MSD performed on sample location MW-12 for TOC exhibited recoveries and RPDs within the control limits.

4.1 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
MW-2 / DUP02	Perchlorate	1000	960	4.1%
	Sulfate	8.2	8.2	0.0%
	TOC	1.1	1.1	AC

Notes:

AC = Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA 314, 300 and SM5310B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R - percent recovery
RPD - relative percent difference,

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE:

DATE: May 20, 2019

PEER REVIEW: Joseph C. Houser

DATE: May 28, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Baltimore #201

Chain of Custody Record 309992

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact:	Date:	COC No:
Company Name: Arcadis	Tel/Fax: 1410 279 8637	Lab Contact:	Carrier:	1 of 2 COCs
Address: 7550 Teague Rd ste. 210	Analysis Turnaround Time			Sampler: AF / KM / MK
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day			Lab Sampling:
Project Name: ATK Orbital Elkton				Job / SDG No.:
Site: Elkton				
PO# MD001006.0006				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOC	8270D - SVOC	6010C - Total Metals	6010C - Dissolved Iron	SM5310 - TOC	300 ORGFM - Sulfate	Nitrite, Nitrate, TCN	1,4-Dioxane	314.0 Perchlorate	Sample Specific Notes:
GM-9M (032019)	3/20	0940	G	GW	6	N	N	3							2	1	
GM-10S (032019		0945			11	Y		3			1	3	1		2	1	
MW-1 (032019)		1200			4	N		3								1	
MW-2 (032019		1320			9	Y		3			1	3	1			1	
MW-10 (032019)		1545			4	N		3								1	
MW-12 (032019		1505			9	Y		3			1	3	1			1	
MW-13 (032019		1440			4	N		3								1	
MW-20 (032019		1330			5	N		3						1		1	
MW-22 (032019		1215			10	Y		3			1	3	1	1		1	
DUP-02 (032019	3/20	1200			9	Y		3			1	3	1			1	
GM-27 (03219	3/21	1115	G	GW	6	N		3							2	1	
TB-02					3	N	N	3									

680-166366 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: 2 coolers 1.3/1.5 1.6/1.8 CUICES

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: ____ Corr'd: ____	Therm ID No.: ____

Relinquished by:	Company: Arcadis	Date/Time: 3/22	Received by:	Company: TA	Date/Time: 3/22/19 1600
Relinquished by:	Company: TA	Date/Time: 3/22/19 1700	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA SDV	Date/Time: 3/23/19 1040

4/8/2019

Baltimore #201

Chain of Custody Record

309993

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

4/8/2019

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact:	Date:	COC No:
Company Name: Arcadis	Tel/Fax: 1410 279 8637	Lab Contact:	Carrier:	2 of 2 COCs
Address: 7550 Teague Rd ste. 210	Analysis Turnaround Time			Sampler: AF/EM/MK
City/State/Zip: Hanover, Md 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital/Elkton	☐ 1 week			
Site: Elkton	☐ 2 days			Job / SDG No.:
PO# MD001006.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	8260B - VOC	8270D - SVOC	6010C - Total/Metals	6010C - dissolved Metals	SM 5310 - TOC	300.0 R6FM - Sulfate	Nitrate, Nitrate, TKN	1,4-Dioxane	314.0 Perchlorate	Sample Specific Notes:
EB-01 (032119)	3/21	1200			24	Y	N	9	1	1	1	3	1	1	4	3	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 2coolers 1.3/1.5 1.6/1.8 CUI#25

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	3/22		TA	3/22/19 1600
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	TA 3/22/19	1700			
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				TA STL	3/23/19 1041

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559011.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166366-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/4/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
		Preservation Codes:						
GM-9M (032019) (680-166366-1)	3/20/19	09:40 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-10S (032019) (680-166366-2)	3/20/19	09:45 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
GM-27 (032119) (680-166366-11)	3/21/19	11:15 Eastern		Water		X	2	1,4 dioxane has been added. Make sure it is spiked
EB-01 (032119) (680-166366-13)	3/21/19	12:00 Eastern		Water		X	4	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 3-25-19 1323	Company	Received by: Angela Pinta via FEDEX	Date/Time: 03/26/19 09:10	Company TA Edison		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 700292		Cooler Temperature(s) °C and Other Remarks: 1.2°C IR#9				

Ver: 01/16/2019

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-9M (032019)
Date Collected: 03/20/19 09:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 16:15	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 16:15	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 16:15	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 16:15	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 16:15	1
Carbon tetrachloride	**0.40**	**J**	1.0	0.33	ug/L			03/30/19 16:15	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 16:15	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 16:15	1
Chloroform	**0.77**	**J**	1.0	0.50	ug/L			03/30/19 16:15	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 16:15	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 16:15	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
cis-1,2-Dichloroethene	**2.6**		1.0	0.41	ug/L			03/30/19 16:15	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 16:15	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 16:15	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 16:15	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 16:15	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 16:15	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 16:15	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 16:15	1
1,1-Dichloroethane	**18**		1.0	0.38	ug/L			03/30/19 16:15	1
1,2-Dichloroethane	**2.6**		1.0	0.50	ug/L			03/30/19 16:15	1
1,1-Dichloroethene	**52**		1.0	0.36	ug/L			03/30/19 16:15	1
1,2-Dichloroethene, Total	**2.6**		2.0	0.37	ug/L			03/30/19 16:15	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 16:15	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 16:15	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 16:15	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 16:15	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 16:15	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 16:15	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 16:15	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 16:15	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:15	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 16:15	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 16:15	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 16:15	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 16:15	1

Client Sample ID: GM-9M (032019)
Date Collected: 03/20/19 09:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 16:15	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 16:15	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 16:15	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 16:15	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 16:15	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:15	1
1,1,1-Trichloroethane	**8.0**		1.0	0.37	ug/L			03/30/19 16:15	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 16:15	1
Trichloroethene	**120**		1.0	0.48	ug/L			03/30/19 16:15	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 16:15	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 16:15	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:15	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 16:15	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 16:15	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 16:15	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 16:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 16:15*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 16:15*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 16:15*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**8.3**		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 16:37	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 16:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*67*		*38 - 125*	*03/26/19 11:53*	*03/27/19 16:37*	*1*
Terphenyl-d14	*62*	*X*	*70 - 130*	*03/26/19 11:53*	*03/27/19 16:37*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**570**		100	28	ug/L			04/02/19 18:53	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-10S (032019)
Date Collected: 03/20/19 09:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 16:41	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 16:41	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 16:41	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 16:41	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 16:41	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 16:41	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 16:41	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 16:41	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 16:41	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 16:41	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 16:41	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 16:41	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 16:41	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 16:41	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 16:41	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 16:41	1
1,1-Dichloroethane	**0.88**	J	1.0	0.38	ug/L			03/30/19 16:41	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
1,1-Dichloroethene	**6.3**		1.0	0.36	ug/L			03/30/19 16:41	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 16:41	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 16:41	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 16:41	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 16:41	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 16:41	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 16:41	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 16:41	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 16:41	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:41	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 16:41	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 16:41	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 16:41	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 16:41	1

Client Sample ID: GM-10S (032019)
Date Collected: 03/20/19 09:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 16:41	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 16:41	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 16:41	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 16:41	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 16:41	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 16:41	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 16:41	1
Trichloroethene	**3.0**		1.0	0.48	ug/L			03/30/19 16:41	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 16:41	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 16:41	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 16:41	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 16:41	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 16:41	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 16:41	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 16:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 16:41*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 16:41*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 16:41*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.89**		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 16:58	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 16:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*80*		*38 - 125*	*03/26/19 11:53*	*03/27/19 16:58*	*1*
Terphenyl-d14	*81*		*70 - 130*	*03/26/19 11:53*	*03/27/19 16:58*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**10**		1.0	0.40	mg/L			04/05/19 16:38	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4.2**		1.0	0.28	ug/L			04/02/19 01:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**18**	**J**	50	17	ug/L		04/01/19 11:47	04/04/19 18:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**0.65**	**J**	1.0	0.50	mg/L			04/05/19 01:58	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-1 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:07	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:07	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:07	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:07	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:07	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 17:07	1
Chloroform	**0.55**	**J**	1.0	0.50	ug/L			03/30/19 17:07	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:07	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:07	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 17:07	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:07	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:07	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:07	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:07	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:07	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:07	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:07	1
1,1-Dichloroethane	**1.3**		1.0	0.38	ug/L			03/30/19 17:07	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
1,1-Dichloroethene	**12**		1.0	0.36	ug/L			03/30/19 17:07	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 17:07	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:07	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:07	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:07	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:07	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:07	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:07	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:07	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:07	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:07	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:07	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:07	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:07	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-1 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:07	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:07	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:07	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:07	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:07	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:07	1
1,1,1-Trichloroethane	**34**		1.0	0.37	ug/L			03/30/19 17:07	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:07	1
Trichloroethene	**0.66**	**J**	1.0	0.48	ug/L			03/30/19 17:07	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:07	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:07	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:07	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:07	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:07	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:07	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 17:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*73 - 131*		*03/30/19 17:07*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*03/30/19 17:07*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 17:07*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**240**		100	28	ug/L			04/02/19 19:16	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~Acetone~~	~~<200~~			200	140	ug/L			03/30/19 17:45	20
Acetone	<10	H	UJ	10	7.0	ug/L			04/04/19 13:02	1
~~Benzene~~	~~<20~~			20	8.6	ug/L			03/30/19 17:45	20
Benzene	<1.0	H		1.0	0.43	ug/L			04/04/19 13:02	1
~~Bromobenzene~~	~~<20~~			20	10	ug/L			03/30/19 17:45	20
Bromobenzene	<1.0	H		1.0	0.50	ug/L			04/04/19 13:02	1
~~Bromochloromethane~~	~~<20~~			20	9.0	ug/L			03/30/19 17:45	20
Bromochloromethane	<1.0	H		1.0	0.45	ug/L			04/04/19 13:02	1
~~Bromodichloromethane~~	~~<20~~			20	8.8	ug/L			03/30/19 17:45	20
Bromodichloromethane	<1.0	H		1.0	0.44	ug/L			04/04/19 13:02	1
~~Bromoform~~	~~<20~~			20	8.6	ug/L			03/30/19 17:45	20
Bromoform	<1.0	H		1.0	0.43	ug/L			04/04/19 13:02	1
~~Bromomethane~~	~~<100~~			100	50	ug/L			03/30/19 17:45	20
Bromomethane	<5.0	H *		5.0	2.5	ug/L			04/04/19 13:02	1
~~2-Butanone~~	~~<200~~			200	68	ug/L			03/30/19 17:45	20
2-Butanone	<10	H		10	3.4	ug/L			04/04/19 13:02	1
~~Carbon disulfide~~	~~<40~~			40	20	ug/L			03/30/19 17:45	20
Carbon disulfide	<2.0	H		2.0	1.0	ug/L			04/04/19 13:02	1
~~Carbon tetrachloride~~	~~<20~~			20	6.6	ug/L			03/30/19 17:45	20
Carbon tetrachloride	<1.0	H		1.0	0.33	ug/L			04/04/19 13:02	1
~~Chlorobenzene~~	~~<20~~			20	5.2	ug/L			03/30/19 17:45	20
Chlorobenzene	<1.0	H		1.0	0.26	ug/L			04/04/19 13:02	1
~~Chloroethane~~	~~<100~~			100	50	ug/L			03/30/19 17:45	20
Chloroethane	<5.0	H		5.0	2.5	ug/L			04/04/19 13:02	1
~~2-Chloroethyl vinyl ether~~	~~<200~~			200	100	ug/L			03/30/19 17:45	20
~~2-Chloroethyl vinyl ether~~	~~<10~~	H	R	10	5.0	ug/L			04/04/19 13:02	1
~~Chloroform~~	~~<20~~			20	10	ug/L			03/30/19 17:45	20
Chloroform	<1.0	H		1.0	0.50	ug/L			04/04/19 13:02	1
~~Chloromethane~~	~~<20~~			20	8.0	ug/L			03/30/19 17:45	20
Chloromethane	<1.0	H		1.0	0.40	ug/L			04/04/19 13:02	1
~~2-Chlorotoluene~~	~~<20~~			20	5.4	ug/L			03/30/19 17:45	20
2-Chlorotoluene	<1.0	H		1.0	0.27	ug/L			04/04/19 13:02	1
~~4-Chlorotoluene~~	~~<20~~			20	9.0	ug/L			03/30/19 17:45	20
4-Chlorotoluene	<1.0	H		1.0	0.45	ug/L			04/04/19 13:02	1
~~cis-1,2-Dichloroethene~~	~~<20~~			20	8.2	ug/L			03/30/19 17:45	20
cis-1,2-Dichloroethene	<1.0	H		1.0	0.41	ug/L			04/04/19 13:02	1
~~cis-1,3-Dichloropropene~~	~~<20~~			20	8.0	ug/L			03/30/19 17:45	20
cis-1,3-Dichloropropene	<1.0	H		1.0	0.40	ug/L			04/04/19 13:02	1
~~Dibromochloromethane~~	~~<20~~			20	6.4	ug/L			03/30/19 17:45	20
Dibromochloromethane	<1.0	H		1.0	0.32	ug/L			04/04/19 13:02	1
~~1,2-Dibromo-3-Chloropropane~~	~~<100~~			100	22	ug/L			03/30/19 17:45	20
1,2-Dibromo-3-Chloropropane	<5.0	H		5.0	1.1	ug/L			04/04/19 13:02	1
~~1,2-Dibromoethane~~	~~<20~~			20	8.8	ug/L			03/30/19 17:45	20
1,2-Dibromoethane	<1.0	H		1.0	0.44	ug/L			04/04/19 13:02	1
~~Dibromomethane~~	~~<20~~			20	7.0	ug/L			03/30/19 17:45	20
Dibromomethane	<1.0	H		1.0	0.35	ug/L			04/04/19 13:02	1
~~1,2-Dichlorobenzene~~	~~<20~~			20	7.4	ug/L			03/30/19 17:45	20
1,2-Dichlorobenzene	<1.0	H		1.0	0.37	ug/L			04/04/19 13:02	1
~~1,3-Dichlorobenzene~~	~~<20~~			20	8.6	ug/L			03/30/19 17:45	20

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	<1.0	H UJ	1.0	0.43	ug/L			04/04/19 13:02	1
1,4-Dichlorobenzene	<20		20	9.2	ug/L			03/30/19 17:45	20
1,4-Dichlorobenzene	<1.0	H	1.0	0.46	ug/L			04/04/19 13:02	1
Dichlorodifluoromethane	<20		20	12	ug/L			03/30/19 17:45	20
Dichlorodifluoromethane	<1.0	H	1.0	0.60	ug/L			04/04/19 13:02	1
1,1-Dichloroethane	<20		20	7.6	ug/L			03/30/19 17:45	20
1,1-Dichloroethane	**2.9**	**H** J	1.0	0.38	ug/L			04/04/19 13:02	1
1,2-Dichloroethane	<20		20	10	ug/L			03/30/19 17:45	20
1,2-Dichloroethane	<1.0	H UJ	1.0	0.50	ug/L			04/04/19 13:02	1
1,1-Dichloroethene	<20		20	7.2	ug/L			03/30/19 17:45	20
1,1-Dichloroethene	<1.0	H	1.0	0.36	ug/L			04/04/19 13:02	1
1,2-Dichloroethene, Total	<40		40	7.4	ug/L			03/30/19 17:45	20
1,2-Dichloroethene, Total	<2.0	H	2.0	0.37	ug/L			04/04/19 13:02	1
1,2-Dichloropropane	<20		20	13	ug/L			03/30/19 17:45	20
1,2-Dichloropropane	<1.0	H	1.0	0.67	ug/L			04/04/19 13:02	1
1,3-Dichloropropane	<20		20	6.8	ug/L			03/30/19 17:45	20
1,3-Dichloropropane	<1.0	H	1.0	0.34	ug/L			04/04/19 13:02	1
2,2-Dichloropropane	<20		20	7.4	ug/L			03/30/19 17:45	20
2,2-Dichloropropane	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
1,1-Dichloropropene	<20		20	6.8	ug/L			03/30/19 17:45	20
1,1-Dichloropropene	<1.0	H	1.0	0.34	ug/L			04/04/19 13:02	1
Ethylbenzene	<20		20	6.6	ug/L			03/30/19 17:45	20
Ethylbenzene	<1.0	H	1.0	0.33	ug/L			04/04/19 13:02	1
Hexachlorobutadiene	<100		100	50	ug/L			03/30/19 17:45	20
Hexachlorobutadiene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
2-Hexanone	<200		200	40	ug/L			03/30/19 17:45	20
2-Hexanone	<10	H	10	2.0	ug/L			04/04/19 13:02	1
Isopropylbenzene	<20		20	7.0	ug/L			03/30/19 17:45	20
Isopropylbenzene	<1.0	H	1.0	0.35	ug/L			04/04/19 13:02	1
Methylene Chloride	<100		100	50	ug/L			03/30/19 17:45	20
Methylene Chloride	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
4-Methyl-2-pentanone	<200		200	42	ug/L			03/30/19 17:45	20
4-Methyl-2-pentanone	<10	H	10	2.1	ug/L			04/04/19 13:02	1
Methyl tert-butyl ether	<200		200	6.0	ug/L			03/30/19 17:45	20
Methyl tert-butyl ether	<10	H	10	0.30	ug/L			04/04/19 13:02	1
m-Xylene & p-Xylene	<20		20	7.0	ug/L			03/30/19 17:45	20
m-Xylene & p-Xylene	<1.0	H	1.0	0.35	ug/L			04/04/19 13:02	1
n-Butylbenzene	<20		20	9.4	ug/L			03/30/19 17:45	20
n-Butylbenzene	<1.0	H	1.0	0.47	ug/L			04/04/19 13:02	1
N-Propylbenzene	<20		20	7.6	ug/L			03/30/19 17:45	20
N-Propylbenzene	<1.0	H	1.0	0.38	ug/L			04/04/19 13:02	1
o-Xylene	<20		20	4.6	ug/L			03/30/19 17:45	20
o-Xylene	<1.0	H	1.0	0.23	ug/L			04/04/19 13:02	1
p-Isopropyltoluene	<20		20	9.6	ug/L			03/30/19 17:45	20
p-Isopropyltoluene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
sec-Butylbenzene	<20		20	8.4	ug/L			03/30/19 17:45	20
sec-Butylbenzene	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
Styrene	<20		20	5.4	ug/L			03/30/19 17:45	20
Styrene	<1.0	H UJ	1.0	0.27	ug/L			04/04/19 13:02	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<20		20	9.0	ug/L			03/30/19 17:45	20
tert-Butylbenzene	<1.0	H UJ	1.0	0.45	ug/L			04/04/19 13:02	1
1,1,1,2-Tetrachloroethane	<20		20	7.4	ug/L			03/30/19 17:45	20
1,1,1,2-Tetrachloroethane	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
1,1,2,2-Tetrachloroethane	<20		20	12	ug/L			03/30/19 17:45	20
1,1,2,2-Tetrachloroethane	<1.0	H	1.0	0.62	ug/L			04/04/19 13:02	1
Tetrachloroethene	<20		20	15	ug/L			03/30/19 17:45	20
Tetrachloroethene	<1.0	H	1.0	0.74	ug/L			04/04/19 13:02	1
Toluene	<20		20	9.6	ug/L			03/30/19 17:45	20
Toluene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
trans-1,2-Dichloroethene	<20		20	7.4	ug/L			03/30/19 17:45	20
trans-1,2-Dichloroethene	<1.0	H	1.0	0.37	ug/L			04/04/19 13:02	1
trans-1,3-Dichloropropene	<20		20	8.4	ug/L			03/30/19 17:45	20
trans-1,3-Dichloropropene	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
1,2,3-Trichlorobenzene	<100		100	50	ug/L			03/30/19 17:45	20
1,2,3-Trichlorobenzene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
1,2,4-Trichlorobenzene	<100		100	50	ug/L			03/30/19 17:45	20
1,2,4-Trichlorobenzene	<5.0	H	5.0	2.5	ug/L			04/04/19 13:02	1
1,1,1-Trichloroethane	43		20	7.4	ug/L			03/30/19 17:45	20
1,1,1-Trichloroethane	37	H J	1.0	0.37	ug/L			04/04/19 13:02	1
1,1,2-Trichloroethane	<20		20	6.6	ug/L			03/30/19 17:45	20
1,1,2-Trichloroethane	<1.0	H UJ	1.0	0.33	ug/L			04/04/19 13:02	1
Trichloroethene	<20		20	9.6	ug/L			03/30/19 17:45	20
Trichloroethene	<1.0	H	1.0	0.48	ug/L			04/04/19 13:02	1
Trichlorofluoromethane	<20		20	8.4	ug/L			03/30/19 17:45	20
Trichlorofluoromethane	<1.0	H	1.0	0.42	ug/L			04/04/19 13:02	1
1,2,3-Trichloropropane	<20		20	7.8	ug/L			03/30/19 17:45	20
1,2,3-Trichloropropane	<1.0	H	1.0	0.39	ug/L			04/04/19 13:02	1
1,2,4-Trimethylbenzene	<20		20	9.4	ug/L			03/30/19 17:45	20
1,2,4-Trimethylbenzene	<1.0	H	1.0	0.47	ug/L			04/04/19 13:02	1
1,3,5-Trimethylbenzene	<20		20	6.2	ug/L			03/30/19 17:45	20
1,3,5-Trimethylbenzene	<1.0	H	1.0	0.31	ug/L			04/04/19 13:02	1
Vinyl acetate	<40		40	16	ug/L			03/30/19 17:45	20
Vinyl acetate	<2.0	H	2.0	0.81	ug/L			04/04/19 13:02	1
Vinyl chloride	<20		20	10	ug/L			03/30/19 17:45	20
Vinyl chloride	<1.0	H	1.0	0.50	ug/L			04/04/19 13:02	1
Xylenes, Total	<20		20	4.6	ug/L			03/30/19 17:45	20
Xylenes, Total	<1.0	H	1.0	0.23	ug/L			04/04/19 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/30/19 17:45*	*20*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 13:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*73 - 131*		*03/30/19 17:45*	*20*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/04/19 13:02*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/30/19 17:45*	*20*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 13:02*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/30/19 17:45*	*20*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/04/19 13:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-2 (032019)
Date Collected: 03/20/19 13:20
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-4
Matrix: Water

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	8.2		1.0	0.40	mg/L			04/05/19 17:16	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1000		200	55	ug/L			04/02/19 19:39	200

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	18	J	50	17	ug/L		03/31/19 13:11	04/01/19 13:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.1		1.0	0.50	mg/L			04/05/19 02:18	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-10 (032019)
Date Collected: 03/20/19 15:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:33	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:33	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:33	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:33	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:33	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 17:33	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:33	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:33	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
cis-1,2-Dichloroethene	**0.81**	**J**	1.0	0.41	ug/L			03/30/19 17:33	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:33	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:33	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:33	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:33	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:33	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:33	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:33	1
1,1-Dichloroethane	**7.4**		1.0	0.38	ug/L			03/30/19 17:33	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
1,1-Dichloroethene	**5.9**		1.0	0.36	ug/L			03/30/19 17:33	1
1,2-Dichloroethene, Total	**0.81**	**J**	2.0	0.37	ug/L			03/30/19 17:33	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:33	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:33	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:33	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:33	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:33	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:33	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:33	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:33	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:33	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:33	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:33	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:33	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-10 (032019)
Date Collected: 03/20/19 15:45
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:33	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:33	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:33	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:33	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:33	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:33	1
1,1,1-Trichloroethane	**0.45**	**J**	1.0	0.37	ug/L			03/30/19 17:33	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:33	1
Trichloroethene	**7.8**		1.0	0.48	ug/L			03/30/19 17:33	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:33	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:33	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:33	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:33	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:33	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:33	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 17:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 17:33*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 17:33*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 17:33*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**46**		1.0	0.28	ug/L			04/02/19 03:06	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-12 (032019)
Date Collected: 03/20/19 15:05
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 17:58	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 17:58	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 17:58	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 17:58	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 17:58	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 17:58	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 17:58	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 17:58	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 17:58	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 17:58	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 17:58	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 17:58	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 17:58	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 17:58	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 17:58	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 17:58	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 17:58	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 17:58	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 17:58	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 17:58	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 17:58	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 17:58	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 17:58	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 17:58	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 17:58	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 17:58	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:58	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 17:58	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 17:58	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 17:58	1

Client Sample ID: MW-12 (032019)
Date Collected: 03/20/19 15:05
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 17:58	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 17:58	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 17:58	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 17:58	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 17:58	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 17:58	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 17:58	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 17:58	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 17:58	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 17:58	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 17:58	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 17:58	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 17:58	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/30/19 17:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 17:58*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 17:58*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/30/19 17:58*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**19**		1.0	0.40	mg/L			04/05/19 17:29	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**350**		100	28	ug/L			04/02/19 20:02	100

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**17**	**J**	50	17	ug/L		03/31/19 13:11	04/01/19 13:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.5**		1.0	0.50	mg/L			04/06/19 21:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-13 (032019)
Date Collected: 03/20/19 14:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	70	ug/L			04/01/19 13:37	10
Benzene	<10		10	4.3	ug/L			04/01/19 13:37	10
Bromobenzene	<10		10	5.0	ug/L			04/01/19 13:37	10
Bromochloromethane	<10		10	4.5	ug/L			04/01/19 13:37	10
Bromodichloromethane	<10		10	4.4	ug/L			04/01/19 13:37	10
Bromoform	<10		10	4.3	ug/L			04/01/19 13:37	10
Bromomethane	<50		50	25	ug/L			04/01/19 13:37	10
2-Butanone	<100		100	34	ug/L			04/01/19 13:37	10
Carbon disulfide	<20		20	10	ug/L			04/01/19 13:37	10
Carbon tetrachloride	<10		10	3.3	ug/L			04/01/19 13:37	10
Chlorobenzene	**740**		10	2.6	ug/L			04/01/19 13:37	10
Chloroethane	<50		50	25	ug/L			04/01/19 13:37	10
2-Chloroethyl vinyl ether	<100	R	100	50	ug/L			04/01/19 13:37	10
Chloroform	<10		10	5.0	ug/L			04/01/19 13:37	10
Chloromethane	<10		10	4.0	ug/L			04/01/19 13:37	10
2-Chlorotoluene	<10		10	2.7	ug/L			04/01/19 13:37	10
4-Chlorotoluene	<10		10	4.5	ug/L			04/01/19 13:37	10
cis-1,2-Dichloroethene	**210**		10	4.1	ug/L			04/01/19 13:37	10
cis-1,3-Dichloropropene	<10		10	4.0	ug/L			04/01/19 13:37	10
Dibromochloromethane	<10		10	3.2	ug/L			04/01/19 13:37	10
1,2-Dibromo-3-Chloropropane	<50		50	11	ug/L			04/01/19 13:37	10
1,2-Dibromoethane	<10		10	4.4	ug/L			04/01/19 13:37	10
Dibromomethane	<10		10	3.5	ug/L			04/01/19 13:37	10
1,2-Dichlorobenzene	<10		10	3.7	ug/L			04/01/19 13:37	10
1,3-Dichlorobenzene	<10		10	4.3	ug/L			04/01/19 13:37	10
1,4-Dichlorobenzene	<10		10	4.6	ug/L			04/01/19 13:37	10
Dichlorodifluoromethane	<10		10	6.0	ug/L			04/01/19 13:37	10
1,1-Dichloroethane	**8.7**	**J**	10	3.8	ug/L			04/01/19 13:37	10
1,2-Dichloroethane	<10		10	5.0	ug/L			04/01/19 13:37	10
1,1-Dichloroethene	**8.4**	**J**	10	3.6	ug/L			04/01/19 13:37	10
1,2-Dichloroethene, Total	**210**		20	3.7	ug/L			04/01/19 13:37	10
1,2-Dichloropropane	<10		10	6.7	ug/L			04/01/19 13:37	10
1,3-Dichloropropane	<10		10	3.4	ug/L			04/01/19 13:37	10
2,2-Dichloropropane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1-Dichloropropene	<10		10	3.4	ug/L			04/01/19 13:37	10
Ethylbenzene	<10		10	3.3	ug/L			04/01/19 13:37	10
Hexachlorobutadiene	<50		50	25	ug/L			04/01/19 13:37	10
2-Hexanone	<100		100	20	ug/L			04/01/19 13:37	10
Isopropylbenzene	<10		10	3.5	ug/L			04/01/19 13:37	10
Methylene Chloride	<50		50	25	ug/L			04/01/19 13:37	10
4-Methyl-2-pentanone	<100		100	21	ug/L			04/01/19 13:37	10
Methyl tert-butyl ether	<100		100	3.0	ug/L			04/01/19 13:37	10
m-Xylene & p-Xylene	<10		10	3.5	ug/L			04/01/19 13:37	10
n-Butylbenzene	<10		10	4.7	ug/L			04/01/19 13:37	10
N-Propylbenzene	<10		10	3.8	ug/L			04/01/19 13:37	10
o-Xylene	<10		10	2.3	ug/L			04/01/19 13:37	10
p-Isopropyltoluene	<10		10	4.8	ug/L			04/01/19 13:37	10
sec-Butylbenzene	<10	*	10	4.2	ug/L			04/01/19 13:37	10
Styrene	<10		10	2.7	ug/L			04/01/19 13:37	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-13 (032019)
Date Collected: 03/20/19 14:40
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<10		10	4.5	ug/L			04/01/19 13:37	10
1,1,1,2-Tetrachloroethane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1,2,2-Tetrachloroethane	<10		10	6.2	ug/L			04/01/19 13:37	10
Tetrachloroethene	<10		10	7.4	ug/L			04/01/19 13:37	10
Toluene	<10		10	4.8	ug/L			04/01/19 13:37	10
trans-1,2-Dichloroethene	<10		10	3.7	ug/L			04/01/19 13:37	10
trans-1,3-Dichloropropene	<10		10	4.2	ug/L			04/01/19 13:37	10
1,2,3-Trichlorobenzene	<50		50	25	ug/L			04/01/19 13:37	10
1,2,4-Trichlorobenzene	<50		50	25	ug/L			04/01/19 13:37	10
1,1,1-Trichloroethane	<10		10	3.7	ug/L			04/01/19 13:37	10
1,1,2-Trichloroethane	<10		10	3.3	ug/L			04/01/19 13:37	10
Trichloroethene	**350**		10	4.8	ug/L			04/01/19 13:37	10
Trichlorofluoromethane	<10		10	4.2	ug/L			04/01/19 13:37	10
1,2,3-Trichloropropane	<10		10	3.9	ug/L			04/01/19 13:37	10
1,2,4-Trimethylbenzene	<10		10	4.7	ug/L			04/01/19 13:37	10
1,3,5-Trimethylbenzene	<10		10	3.1	ug/L			04/01/19 13:37	10
Vinyl acetate	<20		20	8.1	ug/L			04/01/19 13:37	10
Vinyl chloride	<10		10	5.0	ug/L			04/01/19 13:37	10
Xylenes, Total	<10		10	2.3	ug/L			04/01/19 13:37	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 120*		*04/01/19 13:37*	*10*
1,2-Dichloroethane-d4 (Surr)	*110*		*73 - 131*		*04/01/19 13:37*	*10*
Dibromofluoromethane (Surr)	*112*		*80 - 122*		*04/01/19 13:37*	*10*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*04/01/19 13:37*	*10*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**250**		100	28	ug/L			04/02/19 20:25	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-20 (032019)
Date Collected: 03/20/19 13:30
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 18:24	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 18:24	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 18:24	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 18:24	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 18:24	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 18:24	1
Chloroethane	**20**		5.0	2.5	ug/L			03/30/19 18:24	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 18:24	1
Chloroform	**0.55**	**J**	1.0	0.50	ug/L			03/30/19 18:24	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 18:24	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 18:24	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
cis-1,2-Dichloroethene	**0.67**	**J**	1.0	0.41	ug/L			03/30/19 18:24	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 18:24	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 18:24	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 18:24	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 18:24	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 18:24	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 18:24	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 18:24	1
1,1-Dichloroethane	**110**		1.0	0.38	ug/L			03/30/19 18:24	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 18:24	1
1,1-Dichloroethene	**29**		1.0	0.36	ug/L			03/30/19 18:24	1
1,2-Dichloroethene, Total	**0.67**	**J**	2.0	0.37	ug/L			03/30/19 18:24	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 18:24	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 18:24	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 18:24	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 18:24	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 18:24	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 18:24	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 18:24	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:24	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 18:24	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 18:24	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 18:24	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 18:24	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-20 (032019)
Date Collected: 03/20/19 13:30
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 18:24	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 18:24	1
Tetrachloroethene	**0.80**	**J**	1.0	0.74	ug/L			03/30/19 18:24	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 18:24	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 18:24	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:24	1
1,1,1-Trichloroethane	**120**		1.0	0.37	ug/L			03/30/19 18:24	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 18:24	1
Trichloroethene	**5.8**		1.0	0.48	ug/L			03/30/19 18:24	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 18:24	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 18:24	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:24	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 18:24	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 18:24	1
Vinyl chloride	**3.9**		1.0	0.50	ug/L			03/30/19 18:24	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 18:24*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 18:24*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 18:24*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 18:24*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**480**		100	28	ug/L			04/02/19 20:48	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	**2.7**		0.20	0.10	mg/L		04/02/19 11:37	04/03/19 11:47	1
Nitrate Nitrite as N	**0.93**		0.50	0.10	mg/L			03/27/19 09:32	10

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: MW-22 (032019)
Date Collected: 03/20/19 12:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 18:50	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 18:50	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 18:50	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 18:50	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 18:50	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 18:50	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 18:50	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 18:50	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
cis-1,2-Dichloroethene	**2.1**		1.0	0.41	ug/L			03/30/19 18:50	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 18:50	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 18:50	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 18:50	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 18:50	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 18:50	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 18:50	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 18:50	1
1,1-Dichloroethane	**38**		1.0	0.38	ug/L			03/30/19 18:50	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
1,1-Dichloroethene	**9.9**		1.0	0.36	ug/L			03/30/19 18:50	1
1,2-Dichloroethene, Total	**2.1**		2.0	0.37	ug/L			03/30/19 18:50	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 18:50	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 18:50	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 18:50	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 18:50	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 18:50	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 18:50	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 18:50	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:50	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 18:50	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 18:50	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 18:50	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 18:50	1

Client Sample ID: MW-22 (032019)
Date Collected: 03/20/19 12:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 18:50	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 18:50	1
Tetrachloroethene	**13**		1.0	0.74	ug/L			03/30/19 18:50	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 18:50	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 18:50	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 18:50	1
1,1,1-Trichloroethane	**78**		1.0	0.37	ug/L			03/30/19 18:50	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 18:50	1
Trichloroethene	**21**		1.0	0.48	ug/L			03/30/19 18:50	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 18:50	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 18:50	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 18:50	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 18:50	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 18:50	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 18:50	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 18:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 18:50*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*03/30/19 18:50*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 18:50*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**23**		1.0	0.40	mg/L			04/05/19 17:41	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**24**		1.0	0.28	ug/L			04/02/19 05:24	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**57**		50	17	ug/L		03/31/19 13:11	04/01/19 13:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	**0.13**	**J**	0.20	0.10	mg/L		04/02/19 11:33	04/03/19 11:06	1
Nitrate Nitrite as N	**0.87**		0.050	0.010	mg/L			04/06/19 12:29	1
Total Organic Carbon	**0.68**	**J**	1.0	0.50	mg/L			04/06/19 22:24	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: DUP-02 (032019)

Lab Sample ID: 680-166366-10

Date Collected: 03/20/19 12:00

Matrix: Water

Date Received: 03/23/19 10:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 19:15	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 19:15	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 19:15	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 19:15	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 19:15	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 19:15	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 19:15	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 19:15	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 19:15	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 19:15	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 19:15	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 19:15	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 19:15	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 19:15	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 19:15	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 19:15	1
1,1-Dichloroethane	**3.6**		1.0	0.38	ug/L			03/30/19 19:15	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
1,1-Dichloroethene	**1.1**		1.0	0.36	ug/L			03/30/19 19:15	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 19:15	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 19:15	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 19:15	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 19:15	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 19:15	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 19:15	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 19:15	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 19:15	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 19:15	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 19:15	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 19:15	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 19:15	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: DUP-02 (032019)
Date Collected: 03/20/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 19:15	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 19:15	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 19:15	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 19:15	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 19:15	1
1,1,1-Trichloroethane	**47**		1.0	0.37	ug/L			03/30/19 19:15	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 19:15	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 19:15	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 19:15	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 19:15	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 19:15	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 19:15	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 19:15	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 19:15	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 19:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 19:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 19:15*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 19:15*	*1*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*03/30/19 19:15*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**8.2**		1.0	0.40	mg/L			04/05/19 17:54	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**960**		200	55	ug/L			04/02/19 21:11	200

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/31/19 13:11	04/01/19 13:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0	0.50	mg/L			04/06/19 22:50	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: GM-27 (032119)
Date Collected: 03/21/19 11:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 15:50	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 15:50	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 15:50	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 15:50	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 15:50	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 15:50	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 15:50	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 15:50	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 15:50	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 15:50	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 15:50	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 15:50	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 15:50	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 15:50	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 15:50	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 15:50	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 15:50	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 15:50	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 15:50	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 15:50	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 15:50	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 15:50	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 15:50	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 15:50	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/02/19 02:13	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 15:50	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 15:50	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 15:50	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 15:50	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/02/19 02:13	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 15:50	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 15:50	1
o-Xylene	**0.31**	**J**	1.0	0.23	ug/L			03/30/19 15:50	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 15:50	1

Client Sample ID: GM-27 (032119)
Date Collected: 03/21/19 11:15
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 15:50	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 15:50	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 15:50	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 15:50	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 15:50	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 15:50	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 15:50	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 15:50	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 15:50	1
1,2,4-Trimethylbenzene	**1.5**		1.0	0.47	ug/L			03/30/19 15:50	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 15:50	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 15:50	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 15:50	1
Xylenes, Total	**1.5**		1.0	0.23	ug/L			03/30/19 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/30/19 15:50*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/02/19 02:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*03/30/19 15:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*04/02/19 02:13*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*03/30/19 15:50*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 122*		*04/02/19 02:13*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/30/19 15:50*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*04/02/19 02:13*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 17:19	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*38 - 125*	*03/26/19 11:53*	*03/27/19 17:19*	*1*
Terphenyl-d14	*72*		*70 - 130*	*03/26/19 11:53*	*03/27/19 17:19*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/02/19 06:09	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: TB-02
Date Collected: 03/20/19 00:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			03/30/19 11:58	1
Benzene	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
Bromobenzene	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			03/30/19 11:58	1
Bromoform	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
Bromomethane	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
2-Butanone	<10		10	3.4	ug/L			03/30/19 11:58	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			03/30/19 11:58	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			03/30/19 11:58	1
Chloroethane	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			03/30/19 11:58	1
Chloroform	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Chloromethane	<1.0		1.0	0.40	ug/L			03/30/19 11:58	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			03/30/19 11:58	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			03/30/19 11:58	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			03/30/19 11:58	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			03/30/19 11:58	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			03/30/19 11:58	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			03/30/19 11:58	1
Dibromomethane	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			03/30/19 11:58	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			03/30/19 11:58	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			03/30/19 11:58	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			03/30/19 11:58	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			03/30/19 11:58	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			03/30/19 11:58	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			03/30/19 11:58	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			03/30/19 11:58	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			03/30/19 11:58	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
2-Hexanone	<10		10	2.0	ug/L			03/30/19 11:58	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			03/30/19 11:58	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			03/30/19 11:58	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			03/30/19 11:58	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:58	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			03/30/19 11:58	1
o-Xylene	<1.0		1.0	0.23	ug/L			03/30/19 11:58	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
Styrene	<1.0		1.0	0.27	ug/L			03/30/19 11:58	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: TB-02
Date Collected: 03/20/19 00:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			03/30/19 11:58	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			03/30/19 11:58	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			03/30/19 11:58	1
Toluene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			03/30/19 11:58	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			03/30/19 11:58	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			03/30/19 11:58	1
Trichloroethene	<1.0		1.0	0.48	ug/L			03/30/19 11:58	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			03/30/19 11:58	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			03/30/19 11:58	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			03/30/19 11:58	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			03/30/19 11:58	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			03/30/19 11:58	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			03/30/19 11:58	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			03/30/19 11:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/30/19 11:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*03/30/19 11:58*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*03/30/19 11:58*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/30/19 11:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	98		10	7.0	ug/L			04/01/19 17:21	1
Benzene	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/01/19 17:21	1
Bromoform	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
2-Butanone	<10		10	3.4	ug/L			04/01/19 17:21	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/01/19 17:21	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/01/19 17:21	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/01/19 17:21	1
Chloroform	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/01/19 17:21	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/01/19 17:21	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/01/19 17:21	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/01/19 17:21	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/01/19 17:21	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/01/19 17:21	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/01/19 17:21	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/01/19 17:21	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/01/19 17:21	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/01/19 17:21	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/01/19 17:21	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/01/19 17:21	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/01/19 17:21	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/01/19 17:21	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/01/19 17:21	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/01/19 17:21	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
2-Hexanone	<10		10	2.0	ug/L			04/01/19 17:21	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/01/19 17:21	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/01/19 17:21	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/01/19 17:21	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 17:21	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/01/19 17:21	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/01/19 17:21	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/01/19 17:21	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
Styrene	<1.0		1.0	0.27	ug/L			04/01/19 17:21	1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/01/19 17:21	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/01/19 17:21	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/01/19 17:21	1
Toluene	<1.0		1.0	0.48	ug/L			04/01/19 17:21	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/01/19 17:21	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/01/19 17:21	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/01/19 17:21	1
Trichloroethene	**1.2**		1.0	0.48	ug/L			04/01/19 17:21	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/01/19 17:21	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/01/19 17:21	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/01/19 17:21	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/01/19 17:21	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/01/19 17:21	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/01/19 17:21	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/01/19 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/01/19 17:21*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*73 - 131*		*04/01/19 17:21*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/01/19 17:21*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/01/19 17:21*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40		0.40	0.17	ug/L		03/26/19 11:53	03/27/19 17:41	1
Naphthalene	<0.20		0.20	0.12	ug/L		03/26/19 11:53	03/27/19 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*83*		*38 - 125*	*03/26/19 11:53*	*03/27/19 17:41*	*1*
Terphenyl-d14	*88*		*70 - 130*	*03/26/19 11:53*	*03/27/19 17:41*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Acenaphthylene	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Acetophenone	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
Anthracene	<18		18	1.2	ug/L		03/28/19 16:10	03/29/19 18:59	1
Atrazine	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzaldehyde	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[a]anthracene	<18		18	0.97	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[a]pyrene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[b]fluoranthene	<18		18	4.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[g,h,i]perylene	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Benzo[k]fluoranthene	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,1'-Biphenyl	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
Bis(2-chloroethoxy)methane	<18		18	1.7	ug/L		03/28/19 16:10	03/29/19 18:59	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-chloroethyl)ether	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
bis (2-chloroisopropyl) ether	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Bis(2-ethylhexyl) phthalate	<18		18	2.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Bromophenyl phenyl ether	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Butyl benzyl phthalate	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Caprolactam	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Carbazole	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chloroaniline	<35		35	3.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chloro-3-methylphenol	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Chloronaphthalene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Chlorophenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Chlorophenyl phenyl ether	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Chrysene	<18		18	0.90	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dibenz(a,h)anthracene	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dibenzofuran	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,2-Dichlorobenzene	<18		18	0.94	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,3-Dichlorobenzene	<18		18	1.0	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,4-Dichlorobenzene	<18		18	0.95	ug/L		03/28/19 16:10	03/29/19 18:59	1
3,3'-Dichlorobenzidine	<110		110	53	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dichlorophenol	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Diethyl phthalate	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dimethylphenol	<18		18	7.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Dimethyl phthalate	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Di-n-butyl phthalate	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
4,6-Dinitro-2-methylphenol	<88		88	18	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dinitrophenol	<88		88	18	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4-Dinitrotoluene	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,6-Dinitrotoluene	<18		18	1.9	ug/L		03/28/19 16:10	03/29/19 18:59	1
Di-n-octyl phthalate	<18		18	2.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Fluoranthene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Fluorene	<18		18	1.7	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorobenzene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorobutadiene	<18		18	1.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachlorocyclopentadiene	<18		18	4.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Hexachloroethane	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
Indeno[1,2,3-cd]pyrene	<18		18	1.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Isophorone	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Methylnaphthalene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Methylphenol	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
3 & 4 Methylphenol	<18		18	2.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Nitroaniline	<88		88	2.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
3-Nitroaniline	<88		88	8.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Nitroaniline	<88		88	8.8	ug/L		03/28/19 16:10	03/29/19 18:59	1
Nitrobenzene	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
2-Nitrophenol	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
4-Nitrophenol	<88		88	3.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
N-Nitrosodi-n-propylamine	<18		18	1.3	ug/L		03/28/19 16:10	03/29/19 18:59	1
N-Nitrosodiphenylamine	<18		18	1.6	ug/L		03/28/19 16:10	03/29/19 18:59	1
Pentachlorophenol	<88		88	3.5	ug/L		03/28/19 16:10	03/29/19 18:59	1

Client Sample ID: EB-01 (032119)
Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	<18		18	1.4	ug/L		03/28/19 16:10	03/29/19 18:59	1
Phenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1
Pyrene	<18		18	1.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
1,2,4-Trichlorobenzene	<18		18	0.99	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4,5-Trichlorophenol	<18		18	2.1	ug/L		03/28/19 16:10	03/29/19 18:59	1
2,4,6-Trichlorophenol	<18		18	1.5	ug/L		03/28/19 16:10	03/29/19 18:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*31*	*X*	*32 - 113*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
2-Fluorophenol	*29*		*26 - 109*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Nitrobenzene-d5	*32*		*32 - 118*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Phenol-d5	*27*		*27 - 110*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
Terphenyl-d14	*28*		*10 - 126*	*03/28/19 16:10*	*03/29/19 18:59*	*1*
2,4,6-Tribromophenol	*36*	*X*	*39 - 124*	*03/28/19 16:10*	*03/29/19 18:59*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.40	mg/L			04/05/19 22:45	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.28	ug/L			04/03/19 21:10	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<200		200	24	ug/L		04/01/19 11:47	04/04/19 18:47	1
Antimony	<20		20	5.3	ug/L		04/01/19 11:47	04/04/19 18:47	1
Arsenic	<20		20	6.2	ug/L		04/01/19 11:47	04/04/19 18:47	1
Barium	<10		10	1.7	ug/L		04/01/19 11:47	04/04/19 18:47	1
Beryllium	<4.0		4.0	0.10	ug/L		04/01/19 11:47	04/04/19 18:47	1
Cadmium	<5.0		5.0	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Calcium	**200**	**J**	500	25	ug/L		04/01/19 11:47	04/04/19 18:47	1
Chromium	<10		10	1.6	ug/L		04/01/19 11:47	04/04/19 18:47	1
Cobalt	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Copper	**6.3**	**J B**	20	1.8	ug/L		04/01/19 11:47	04/04/19 18:47	1
Iron	<50		50	17	ug/L		04/01/19 11:47	04/04/19 18:47	1
Lead	<10		10	3.9	ug/L		04/01/19 11:47	04/04/19 18:47	1
Magnesium	**43**	**J**	500	33	ug/L		04/01/19 11:47	04/04/19 18:47	1
Manganese	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Nickel	<40		40	2.1	ug/L		04/01/19 11:47	04/04/19 18:47	1
Potassium	<1000		1000	17	ug/L		04/01/19 11:47	04/04/19 18:47	1
Selenium	<20		20	9.9	ug/L		04/01/19 11:47	04/04/19 18:47	1
Silver	<10		10	0.60	ug/L		04/01/19 11:47	04/04/19 18:47	1
Sodium	**710**	**J**	1000	480	ug/L		04/01/19 11:47	04/04/19 18:47	1
Thallium	<25		25	6.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Vanadium	<10		10	1.0	ug/L		04/01/19 11:47	04/04/19 18:47	1
Zinc	<20		20	7.0	ug/L		04/01/19 11:47	04/04/19 18:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		03/31/19 13:11	04/01/19 13:22	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166366-1

Client Sample ID: EB-01 (032119)

Date Collected: 03/21/19 12:00
Date Received: 03/23/19 10:15

Lab Sample ID: 680-166366-13

Matrix: Water

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20	~~A~~	0.20	0.080	ug/L		04/03/19 13:10	04/08/19 11:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Kjeldahl	<0.20		0.20	0.10	mg/L		04/02/19 11:33	04/03/19 11:05	1
Nitrate Nitrite as N	<0.050		0.050	0.010	mg/L			04/06/19 12:30	1
Total Organic Carbon	<1.0		1.0	0.50	mg/L			04/06/19 23:09	1

ARCADIS Design & Consultancy for natural and built assets

ATK – Elkton

DATA REVIEW

Elkton, MD

Volatile, Semivolatile, Metals and Miscellaneous Analyses

SDG #680-166434-1

Analyses Performed By:
Test America

Savannah, GA, Edison, NJ and Pheonix, AZ

Report #32808R
Review Level: Tier II
Project: MD001106.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #680-166434-1 for samples collected in association with the ATK Elkton site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
					VOC	SVOC	PCB	MET	MISC
BS-1 (032219)	680-166434-1	Water	3/22/2019		X	X		X	X
MW-5 (032219)	680-166434-2	Water	3/22/2019		X				X
MW-11 (032219)	680-166434-3	Water	3/22/2019						X
MW-19 (032219)	680-166434-4	Water	3/22/2019		X				X
MW-23 (032219)	680-166434-5	Water	3/22/2019		X				X
DUP03 (032219)	680-166434-6	Water	3/22/2019	MW-23 (032219)	X				X
MW-25 (032219)	680-166434-7	Water	3/22/2019		X			X	X
MW-28 (032219)	680-166434-8	Water	3/22/2019		X			X	X
MW-29 (032219)	680-166434-9	Water	3/22/2019		X				X
TB-03 (032519)	680-166434-10	Water	3/22/2019		X				

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8270D. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 1999. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Note: 2-Chloroethyl vinyl ether degrades in the presence of acid. Since the sample was preserved with acid to a pH of less than 2, the results for 2-chloroethyl vinyl ether were rejected.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
BS-1 MW-19 MW-23 DUP03 MW-25 MW-28 MW-29 TB-03	Bromomethane	>UL	>UL
MW-5	Chloromethane	AC	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Note:
Sample results were not qualified as rejected (R) due to the deviations listed above.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-23 / DUP03	1,1-Dichloroethane	1.8	1.6	AC
	1,1-Dichloroethene	1.4	1.3	AC
	1,1,1-Trichloroethane	7.9	7.3	7.9%

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)	X				X
Matrix Spike Duplicate(MSD)	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not included in the data package.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010, 7470A, 300.0, 314.0 and SM5310 B-2011. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 2004. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010	Water	180 days from collection to analysis	Preserved to a pH of less than 2.
SW-846 7470	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BS-1	Copper	Detected sample results <RL and <BAL	“UB” at the RL

Note:

RL Reporting limit

3. Matrix Spike (MS) and Matrix Spike Duplicate(MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte’s concentration detected in the parent sample exceeds the MS/MSD concentration by a

factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery	MSD Recovery
MW-28	Dissolved Iron	52%	46%

The criteria used to evaluate MS recoveries are presented in the following table. In the case of an MS deviation, the sample results are qualified. The qualifications are applied to all sample results associated with this SDG.

Control limit	Sample Result	Qualification
MS percent recovery 30% to 74%	Non-detect	UJ
	Detect	J
MS percent recovery <30%	Non-detect	R
	Detect	J
MS percent recovery >125%	Non-detect	No Action
	Detect	J

3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

A laboratory duplicate was not included in the data package.

4 Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not included in the data package.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All LCS recoveries were within the control limits.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METAL

METALS; SW-846 6010/7470	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X	X		
C. Equipment/Field Blanks	X				X
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)	X				X
Total vs. Dissolved		X		X	
Reporting Limit Verification		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Perchlorate by EPA 314.0	Water	28 days from collection to analysis	Cool to <6 °C.
Sulfate by EPA 300.0	Water	28 days from collection to analysis	Cool to <6 °C.
TOC by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved with H_2SO_4
EPA 351.2 (TKN)	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Matrix Spike (MS) and Matrix Spike Duplicate (MSD)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD performed on sample location BS-1 for perchlorate exhibited recoveries and RPDs within the control limits.

4.1 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water

matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
MW-23 / DUP03	Perchlorate	7.9	7.7	2.6%

Notes:

AC = Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA 314, 300 and SM5310B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R - percent recovery
RPD - relative percent difference,

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE:

DATE: May 21, 2019

PEER REVIEW: Joseph C. Houser

DATE: May 28, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Baltimore #201

Chain of Custody Record 309995

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zambito	Date: 3/22/2019	COC No:
Company Name: Arcadis IAC	Tel/Fax:	Lab Contact:	Carrier:	1 of ____ COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler:
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital	☐ 1 week			Job / SDG No.:
Site: Elkton, MD	☐ 2 days			
PO# MD001606.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOCs	8270D-SVOC	6010C - Dissolved Iron	SM5310_TOC_B	300.0_28D	Total Nitrogen_353.2_351.2	314.0 - Perchlorate	6010C - Total metals	Sample Specific Notes:
BS-1(032219)	3/22/19	1230		GW	11			3	1	1	3	1		1	1	
MW-5(032219)		1400		GW	4			3						1	X KM	
MW-11(032219)		1300		GW	1								1			
MW-19(032219)		1445		GW	4			3						1		
MW-23(032219)		1030		GW	4			3						1		
DUP03(032219)		1200		GW	4			3						1		
MW-25(032219)		1540		GW	9			3		1	3	1		1		
MW-28(032219)		1025		GW	9			3		1	3	1		1		
MW-29(032219)	↓	1140		GW	4			3						1		
TB-03(032519)					2			2								

680-166434 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

1.4 1.6 CW IR35

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ | Therm ID No.: ____

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis		Received by:	TA	3/25/19 1230
Relinquished by:	TA	3/25/19 1700	Received by:		
Relinquished by:			Received in Laboratory by:	TASTAV	3/26/19 858

4/9/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-559197.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166434-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/5/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
BS-1 (032219) (680-166434-1)	3/22/19	12:30 Eastern		Water			X	1	
MW-5 (032219) (680-166434-2)	3/22/19	14:00 Eastern		Water			X	1	
MW-19 (032219) (680-166434-4)	3/22/19	14:45 Eastern		Water			X	1	
MW-23 (032219) (680-166434-5)	3/22/19	10:30 Eastern		Water			X	1	
DUP03 (032219) (680-166434-6)	3/22/19	12:00 Eastern		Water			X	1	
MW-25 (032219) (680-166434-7)	3/22/19	15:40 Eastern		Water			X	1	
MW-28 (032219) (680-166434-8)	3/22/19	10:25 Eastern		Water			X	1	
MW-29 (032219) (680-166434-9)	3/22/19	11:40 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	3-26-19 1645	TAL SAV	[signature]		
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	3-27-19 0945	TAL-SAV

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: (2.4°C) RTD

Ver: 01/16/2019

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 12:10	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 12:10	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 12:10	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 12:10	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 12:10	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 12:10	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 12:10	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 12:10	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 12:10	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 12:10	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 12:10	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 12:10	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 12:10	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 12:10	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 12:10	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 12:10	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 12:10	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 12:10	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 12:10	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 12:10	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 12:10	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 12:10	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 12:10	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 12:10	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 12:10	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 12:10	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 12:10	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 12:10	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 12:10	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 12:10	1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 12:10	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 12:10	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 12:10	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 12:10	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 12:10	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 12:10	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 12:10	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 12:10	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 12:10	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 12:10	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 12:10	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 12:10	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 12:10	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 12:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 12:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 12:10*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 12:10*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 12:10*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
Acenaphthylene	<9.6		9.6	0.82	ug/L		03/28/19 16:10	03/29/19 20:30	1
Acetophenone	<9.6		9.6	0.55	ug/L		03/28/19 16:10	03/29/19 20:30	1
Anthracene	<9.6		9.6	0.67	ug/L		03/28/19 16:10	03/29/19 20:30	1
Atrazine	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzaldehyde	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[a]anthracene	<9.6		9.6	0.53	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[a]pyrene	<9.6		9.6	0.68	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[b]fluoranthene	<9.6		9.6	2.5	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[g,h,i]perylene	<9.6		9.6	0.84	ug/L		03/28/19 16:10	03/29/19 20:30	1
Benzo[k]fluoranthene	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,1'-Biphenyl	<9.6		9.6	0.56	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-chloroethoxy)methane	<9.6		9.6	0.91	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-chloroethyl)ether	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
bis (2-chloroisopropyl) ether	<9.6		9.6	0.75	ug/L		03/28/19 16:10	03/29/19 20:30	1
Bis(2-ethylhexyl) phthalate	<9.6		9.6	1.5	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Bromophenyl phenyl ether	<9.6		9.6	0.74	ug/L		03/28/19 16:10	03/29/19 20:30	1
Butyl benzyl phthalate	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
Caprolactam	**87**		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
Carbazole	<9.6		9.6	0.68	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chloroaniline	<19		19	2.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chloro-3-methylphenol	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.6		9.6	0.77	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Chlorophenol	<9.6		9.6	0.84	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Chlorophenyl phenyl ether	<9.6		9.6	0.81	ug/L		03/28/19 16:10	03/29/19 20:30	1
Chrysene	<9.6		9.6	0.49	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dibenz(a,h)anthracene	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dibenzofuran	<9.6		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,2-Dichlorobenzene	<9.6		9.6	0.51	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,3-Dichlorobenzene	<9.6		9.6	0.57	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,4-Dichlorobenzene	<9.6		9.6	0.52	ug/L		03/28/19 16:10	03/29/19 20:30	1
3,3'-Dichlorobenzidine	<58		58	29	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dichlorophenol	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Diethyl phthalate	<9.6		9.6	0.85	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dimethylphenol	<9.6		9.6	3.9	ug/L		03/28/19 16:10	03/29/19 20:30	1
Dimethyl phthalate	<9.6		9.6	0.95	ug/L		03/28/19 16:10	03/29/19 20:30	1
Di-n-butyl phthalate	<9.6		9.6	0.80	ug/L		03/28/19 16:10	03/29/19 20:30	1
4,6-Dinitro-2-methylphenol	<48		48	9.6	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dinitrophenol	<48		48	9.6	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4-Dinitrotoluene	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,6-Dinitrotoluene	<9.6		9.6	1.1	ug/L		03/28/19 16:10	03/29/19 20:30	1
Di-n-octyl phthalate	<9.6		9.6	1.4	ug/L		03/28/19 16:10	03/29/19 20:30	1
Fluoranthene	<9.6		9.6	0.71	ug/L		03/28/19 16:10	03/29/19 20:30	1
Fluorene	<9.6		9.6	0.93	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorobenzene	<9.6		9.6	0.76	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorobutadiene	<9.6		9.6	0.60	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachlorocyclopentadiene	<9.6		9.6	2.4	ug/L		03/28/19 16:10	03/29/19 20:30	1
Hexachloroethane	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
Indeno[1,2,3-cd]pyrene	<9.6		9.6	0.96	ug/L		03/28/19 16:10	03/29/19 20:30	1
Isophorone	<9.6		9.6	0.87	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Methylnaphthalene	<9.6		9.6	0.75	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Methylphenol	<9.6		9.6	0.86	ug/L		03/28/19 16:10	03/29/19 20:30	1
3 & 4 Methylphenol	<9.6		9.6	1.3	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Nitroaniline	<48		48	1.3	ug/L		03/28/19 16:10	03/29/19 20:30	1
3-Nitroaniline	<48		48	4.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Nitroaniline	<48		48	4.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
Nitrobenzene	<9.6		9.6	0.70	ug/L		03/28/19 16:10	03/29/19 20:30	1
2-Nitrophenol	<9.6		9.6	0.73	ug/L		03/28/19 16:10	03/29/19 20:30	1
4-Nitrophenol	<48		48	1.8	ug/L		03/28/19 16:10	03/29/19 20:30	1
N-Nitrosodi-n-propylamine	<9.6		9.6	0.69	ug/L		03/28/19 16:10	03/29/19 20:30	1
N-Nitrosodiphenylamine	<9.6		9.6	0.89	ug/L		03/28/19 16:10	03/29/19 20:30	1
Pentachlorophenol	<48		48	1.9	ug/L		03/28/19 16:10	03/29/19 20:30	1
Phenanthrene	<9.6		9.6	0.74	ug/L		03/28/19 16:10	03/29/19 20:30	1
Phenol	<9.6		9.6	0.80	ug/L		03/28/19 16:10	03/29/19 20:30	1
Pyrene	<9.6		9.6	0.61	ug/L		03/28/19 16:10	03/29/19 20:30	1
1,2,4-Trichlorobenzene	<9.6		9.6	0.54	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4,5-Trichlorophenol	<9.6		9.6	1.2	ug/L		03/28/19 16:10	03/29/19 20:30	1
2,4,6-Trichlorophenol	<9.6		9.6	0.82	ug/L		03/28/19 16:10	03/29/19 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*76*		*32 - 113*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
2-Fluorophenol	*57*		*26 - 109*	*03/28/19 16:10*	*03/29/19 20:30*	*1*

Client Sample ID: BS-1 (032219)
Date Collected: 03/22/19 12:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*70*		*32 - 118*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
Phenol-d5	*63*		*27 - 110*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
Terphenyl-d14	*37*		*10 - 126*	*03/28/19 16:10*	*03/29/19 20:30*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*03/28/19 16:10*	*03/29/19 20:30*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**1.2**		1.0	0.40	mg/L			04/08/19 23:22	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/03/19 21:56	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**320**		200	24	ug/L		04/02/19 12:50	04/04/19 19:55	1
Antimony	<20		20	5.3	ug/L		04/02/19 12:50	04/04/19 19:55	1
Arsenic	<20		20	6.2	ug/L		04/02/19 12:50	04/04/19 19:55	1
Barium	**21**		10	1.7	ug/L		04/02/19 12:50	04/04/19 19:55	1
Beryllium	<4.0		4.0	0.10	ug/L		04/02/19 12:50	04/04/19 19:55	1
Cadmium	<5.0		5.0	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Calcium	**35000**		500	25	ug/L		04/02/19 12:50	04/04/19 19:55	1
Chromium	**3.0**	**J**	10	1.6	ug/L		04/02/19 12:50	04/04/19 19:55	1
Cobalt	**2.7**	**J**	10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Copper	20 ~~**6.5**~~	~~**J B**~~ UB	20	1.8	ug/L		04/02/19 12:50	04/04/19 19:55	1
Iron	**1800**		50	17	ug/L		04/02/19 12:50	04/04/19 19:55	1
Lead	<10		10	3.9	ug/L		04/02/19 12:50	04/04/19 19:55	1
Magnesium	**10000**		500	33	ug/L		04/02/19 12:50	04/04/19 19:55	1
Manganese	**230**		10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Nickel	**5.5**	**J**	40	2.1	ug/L		04/02/19 12:50	04/04/19 19:55	1
Potassium	**1100**		1000	17	ug/L		04/02/19 12:50	04/04/19 19:55	1
Selenium	<20		20	9.9	ug/L		04/02/19 12:50	04/04/19 19:55	1
Silver	<10		10	0.60	ug/L		04/02/19 12:50	04/04/19 19:55	1
Sodium	**24000**		1000	480	ug/L		04/02/19 12:50	04/04/19 19:55	1
Thallium	<25		25	6.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Vanadium	**2.4**	**J**	10	1.0	ug/L		04/02/19 12:50	04/04/19 19:55	1
Zinc	**7.3**	**J**	20	7.0	ug/L		04/02/19 12:50	04/04/19 19:55	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**200**	J	50	17	ug/L		04/02/19 11:24	04/03/19 01:15	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/03/19 14:17	04/05/19 22:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**4.0**		1.0	0.50	mg/L			04/07/19 07:16	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-5 (032219)
Date Collected: 03/22/19 14:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/05/19 02:17	1
Benzene	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/05/19 02:17	1
Bromoform	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Butanone	<10		10	3.4	ug/L			04/05/19 02:17	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/05/19 02:17	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/05/19 02:17	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/05/19 02:17	1
Chloroform	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/05/19 02:17	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/05/19 02:17	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
cis-1,2-Dichloroethene	**2.7**		1.0	0.41	ug/L			04/05/19 02:17	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/05/19 02:17	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/05/19 02:17	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/05/19 02:17	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/05/19 02:17	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/05/19 02:17	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/05/19 02:17	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/05/19 02:17	1
1,1-Dichloroethane	**0.62**	**J**	1.0	0.38	ug/L			04/05/19 02:17	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
1,1-Dichloroethene	**0.60**	**J**	1.0	0.36	ug/L			04/05/19 02:17	1
1,2-Dichloroethene, Total	**2.7**		2.0	0.37	ug/L			04/05/19 02:17	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/05/19 02:17	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/05/19 02:17	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/05/19 02:17	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
2-Hexanone	<10		10	2.0	ug/L			04/05/19 02:17	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/05/19 02:17	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/05/19 02:17	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/05/19 02:17	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 02:17	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/05/19 02:17	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/05/19 02:17	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/05/19 02:17	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
Styrene	<1.0		1.0	0.27	ug/L			04/05/19 02:17	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-5 (032219)
Date Collected: 03/22/19 14:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/05/19 02:17	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/05/19 02:17	1
Tetrachloroethene	**29**		1.0	0.74	ug/L			04/05/19 02:17	1
Toluene	<1.0		1.0	0.48	ug/L			04/05/19 02:17	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/05/19 02:17	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/05/19 02:17	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/05/19 02:17	1
Trichloroethene	**14**		1.0	0.48	ug/L			04/05/19 02:17	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/05/19 02:17	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/05/19 02:17	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/05/19 02:17	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/05/19 02:17	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/05/19 02:17	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/05/19 02:17	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/05/19 02:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/05/19 02:17*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/05/19 02:17*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/05/19 02:17*	*1*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*		*04/05/19 02:17*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**15**		1.0	0.31	ug/L			04/03/19 23:28	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-11 (032219)
Date Collected: 03/22/19 13:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-3
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Total	1.6		0.25	0.25	mg/L			03/26/19 15:01	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-19 (032219)
Date Collected: 03/22/19 14:45
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 15:36	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 15:36	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 15:36	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 15:36	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 15:36	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 15:36	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 15:36	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 15:36	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 15:36	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 15:36	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 15:36	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 15:36	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 15:36	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 15:36	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 15:36	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 15:36	1
1,1-Dichloroethane	**1.5**		1.0	0.38	ug/L			04/04/19 15:36	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
1,1-Dichloroethene	**10**		1.0	0.36	ug/L			04/04/19 15:36	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 15:36	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 15:36	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 15:36	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 15:36	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 15:36	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 15:36	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 15:36	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 15:36	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:36	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 15:36	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 15:36	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 15:36	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 15:36	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-19 (032219)
Date Collected: 03/22/19 14:45
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 15:36	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 15:36	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 15:36	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 15:36	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 15:36	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:36	1
1,1,1-Trichloroethane	**2.8**		1.0	0.37	ug/L			04/04/19 15:36	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 15:36	1
Trichloroethene	**1.7**		1.0	0.48	ug/L			04/04/19 15:36	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 15:36	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 15:36	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:36	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 15:36	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 15:36	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 15:36	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 15:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 15:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 15:36*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 15:36*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/04/19 15:36*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**650**		100	31	ug/L			04/04/19 17:27	100

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-23 (032219)
Date Collected: 03/22/19 10:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 13:28	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 13:28	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 13:28	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 13:28	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 13:28	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 13:28	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 13:28	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 13:28	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 13:28	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 13:28	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 13:28	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 13:28	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 13:28	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 13:28	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 13:28	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 13:28	1
1,1-Dichloroethane	**1.8**		1.0	0.38	ug/L			04/04/19 13:28	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
1,1-Dichloroethene	**1.4**		1.0	0.36	ug/L			04/04/19 13:28	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 13:28	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 13:28	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 13:28	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 13:28	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 13:28	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 13:28	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 13:28	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 13:28	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:28	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 13:28	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 13:28	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 13:28	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-23 (032219)
Date Collected: 03/22/19 10:30
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 13:28	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 13:28	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 13:28	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 13:28	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:28	1
1,1,1-Trichloroethane	**7.9**		1.0	0.37	ug/L			04/04/19 13:28	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 13:28	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 13:28	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 13:28	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 13:28	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:28	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 13:28	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 13:28	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 13:28	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 13:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*80 - 120*		*04/04/19 13:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 13:28*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 13:28*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 13:28*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**7.9**		1.0	0.31	ug/L			04/04/19 00:14	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: DUP03 (032219)
Date Collected: 03/22/19 12:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 13:53	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 13:53	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 13:53	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 13:53	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 13:53	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 13:53	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 13:53	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 13:53	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 13:53	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 13:53	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 13:53	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 13:53	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 13:53	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 13:53	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 13:53	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 13:53	1
1,1-Dichloroethane	**1.6**		1.0	0.38	ug/L			04/04/19 13:53	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
1,1-Dichloroethene	**1.3**		1.0	0.36	ug/L			04/04/19 13:53	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 13:53	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 13:53	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 13:53	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 13:53	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 13:53	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 13:53	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 13:53	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 13:53	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:53	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 13:53	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 13:53	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 13:53	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: DUP03 (032219)
Date Collected: 03/22/19 12:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 13:53	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 13:53	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 13:53	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 13:53	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 13:53	1
1,1,1-Trichloroethane	**7.3**		1.0	0.37	ug/L			04/04/19 13:53	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 13:53	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 13:53	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 13:53	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 13:53	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 13:53	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 13:53	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 13:53	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 13:53	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 13:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 13:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 13:53*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/04/19 13:53*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 13:53*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**7.7**		1.0	0.31	ug/L			04/04/19 00:36	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-25 (032219)
Date Collected: 03/22/19 15:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 14:19	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 14:19	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 14:19	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 14:19	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 14:19	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 14:19	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 14:19	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 14:19	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 14:19	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 14:19	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 14:19	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 14:19	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 14:19	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 14:19	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 14:19	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 14:19	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 14:19	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 14:19	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 14:19	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 14:19	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 14:19	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 14:19	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 14:19	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 14:19	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 14:19	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 14:19	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:19	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 14:19	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 14:19	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 14:19	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-25 (032219)
Date Collected: 03/22/19 15:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 14:19	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 14:19	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 14:19	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:19	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:19	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 14:19	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 14:19	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 14:19	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 14:19	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:19	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 14:19	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 14:19	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 14:19	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 14:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/04/19 14:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 14:19*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 14:19*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/04/19 14:19*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**22**		1.0	0.40	mg/L			04/08/19 23:35	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**56**		10	3.1	ug/L			04/04/19 17:50	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50	UJ	50	17	ug/L		04/02/19 11:24	04/03/19 01:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**3.1**		1.0	0.50	mg/L			04/07/19 08:31	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-28 (032219)
Date Collected: 03/22/19 10:25
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 14:45	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 14:45	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 14:45	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 14:45	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 14:45	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 14:45	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 14:45	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 14:45	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 14:45	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 14:45	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
cis-1,2-Dichloroethene	**2.9**		1.0	0.41	ug/L			04/04/19 14:45	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 14:45	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 14:45	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 14:45	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 14:45	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 14:45	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 14:45	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 14:45	1
1,1-Dichloroethane	**30**		1.0	0.38	ug/L			04/04/19 14:45	1
1,2-Dichloroethane	**0.64**	J	1.0	0.50	ug/L			04/04/19 14:45	1
1,1-Dichloroethene	**2.3**		1.0	0.36	ug/L			04/04/19 14:45	1
1,2-Dichloroethene, Total	**2.9**		2.0	0.37	ug/L			04/04/19 14:45	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 14:45	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 14:45	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 14:45	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 14:45	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 14:45	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 14:45	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 14:45	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:45	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 14:45	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 14:45	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 14:45	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 14:45	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-28 (032219)
Date Collected: 03/22/19 10:25
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 14:45	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 14:45	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 14:45	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 14:45	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 14:45	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 14:45	1
1,1,1-Trichloroethane	**14**		1.0	0.37	ug/L			04/04/19 14:45	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 14:45	1
Trichloroethene	**20**		1.0	0.48	ug/L			04/04/19 14:45	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 14:45	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 14:45	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 14:45	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 14:45	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 14:45	1
Vinyl chloride	**2.1**		1.0	0.50	ug/L			04/04/19 14:45	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 14:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*73 - 131*		*04/04/19 14:45*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 14:45*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/04/19 14:45*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**26**		1.0	0.40	mg/L			04/08/19 23:47	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**160**		10	3.1	ug/L			04/04/19 18:13	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**14000**	~~F1~~ J	50	17	ug/L		04/02/19 11:24	04/03/19 00:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**9.2**		1.0	0.50	mg/L			04/07/19 08:56	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-29 (032219)
Date Collected: 03/22/19 11:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 15:10	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 15:10	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 15:10	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 15:10	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 15:10	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 15:10	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 15:10	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 15:10	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
cis-1,2-Dichloroethene	**1.7**		1.0	0.41	ug/L			04/04/19 15:10	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 15:10	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 15:10	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 15:10	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 15:10	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 15:10	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 15:10	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 15:10	1
1,1-Dichloroethane	**4.6**		1.0	0.38	ug/L			04/04/19 15:10	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
1,1-Dichloroethene	**7.8**		1.0	0.36	ug/L			04/04/19 15:10	1
1,2-Dichloroethene, Total	**1.7**	**J**	2.0	0.37	ug/L			04/04/19 15:10	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 15:10	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 15:10	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 15:10	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 15:10	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 15:10	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 15:10	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 15:10	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:10	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 15:10	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 15:10	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 15:10	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 15:10	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: MW-29 (032219)
Date Collected: 03/22/19 11:40
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 15:10	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 15:10	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 15:10	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 15:10	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 15:10	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 15:10	1
1,1,1-Trichloroethane	**12**		1.0	0.37	ug/L			04/04/19 15:10	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 15:10	1
Trichloroethene	**17**		1.0	0.48	ug/L			04/04/19 15:10	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 15:10	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 15:10	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 15:10	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 15:10	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 15:10	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 15:10	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 15:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/04/19 15:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 15:10*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/04/19 15:10*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/04/19 15:10*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4100**		200	63	ug/L			04/04/19 23:11	200

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166434-1

Client Sample ID: TB-03 (032519)
Date Collected: 03/22/19 00:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/04/19 11:19	1
Benzene	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/04/19 11:19	1
Bromoform	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
2-Butanone	<10		10	3.4	ug/L			04/04/19 11:19	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/04/19 11:19	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/04/19 11:19	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/04/19 11:19	1
Chloroform	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/04/19 11:19	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/04/19 11:19	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/04/19 11:19	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/04/19 11:19	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/04/19 11:19	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/04/19 11:19	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/04/19 11:19	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/04/19 11:19	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/04/19 11:19	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/04/19 11:19	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/04/19 11:19	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/04/19 11:19	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/04/19 11:19	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/04/19 11:19	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/04/19 11:19	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/04/19 11:19	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
2-Hexanone	<10		10	2.0	ug/L			04/04/19 11:19	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/04/19 11:19	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/04/19 11:19	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/04/19 11:19	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 11:19	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/04/19 11:19	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/04/19 11:19	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
Styrene	<1.0		1.0	0.27	ug/L			04/04/19 11:19	1

Client Sample ID: TB-03 (032519)
Date Collected: 03/22/19 00:00
Date Received: 03/26/19 08:58

Lab Sample ID: 680-166434-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/04/19 11:19	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/04/19 11:19	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/04/19 11:19	1
Toluene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/04/19 11:19	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/04/19 11:19	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/04/19 11:19	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/04/19 11:19	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/04/19 11:19	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/04/19 11:19	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/04/19 11:19	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/04/19 11:19	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/04/19 11:19	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/04/19 11:19	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/04/19 11:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*101*		*80 - 120*		*04/04/19 11:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/04/19 11:19*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/04/19 11:19*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/04/19 11:19*	*1*

ARCADIS Design & Consultancy for natural and built assets

ATK – Elkton

DATA REVIEW

Elkton, MD

Volatile, Semivolatile, Metals and Miscellaneous Analyses

SDG #680-166589-1

Analyses Performed By:
Test America

Savannah, GA, Edison, NJ and Pheonix, AZ

Report #32809R
Review Level: Tier II
Project: MD001106.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #680-166589-1 for samples collected in association with the ATK Elkton site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
					VOC	SVOC	PCB	MET	MISC
GM-21M (032519)	680-166589-1	Water	3/25/2019		X	X		X	X
GM-21S (032519)	680-166589-2	Water	3/25/2019		X	X			X
GM-22M (032519)	680-166589-3	Water	3/25/2019		X	X		X	X
GM-22S (032519)	680-166589-4	Water	3/25/2019		X	X			X
GM-32 (032519)	680-166589-5	Water	3/25/2019		X	X			X
GM-32D (032519)	680-166589-6	Water	3/25/2019		X	X			X
DUP04 (032519)	680-166589-7	Water	3/25/2019	GM-21M (032519)	X	X		X	X
TB-05(03252019)	680-166589-8	Water	3/25/2019		X				
EB-02 (032519)	680-166589-9	Water	3/25/2019		X	X		X	X
GM-2B (032619)	680-166589-10	Water	3/26/2019		X	X		X	X
GM-16M (032619)	680-166589-11	Water	3/26/2019		X	X			X
GM-16S (032619)	680-166589-12	Water	3/26/2019		X	X			X
GM-26M (032619)	680-166589-13	Water	3/26/2019		X	X		X	X
GM-26S (032619)	680-166589-14	Water	3/26/2019		X	X			X
GM-30M (032619)	680-166589-15	Water	3/26/2019		X	X			X
GM-31M (032619)	680-166589-16	Water	3/26/2019		X	X			X
GM-31S (032619)	680-166589-17	Water	3/26/2019		X	X			X
DUP05 (032619)	680-166589-18	Water	3/26/2019	GM-31M (032619)	X	X			X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8270D (SIM). All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 1999. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Note: 2-Chloroethyl vinyl ether degrades in the presence of acid. Since the sample was preserved with acid to a pH of less than 2, the results for 2-chloroethyl vinyl ether were rejected.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All LCS/LCSD recoveries were within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
GM-21M / DUP04	Carbon Tetrachloride	0.53 J	0.53 J	AC
	Chloroform	0.58 J	0.65 J	AC
	cis-1,2-Dichloroethene	4.1	4.0	AC
	1,1-Dichloroethane	0.81 J	0.92 J	AC
	1,2-Dichloroethane	0.60 J	0.65 J	AC
	1,1-Dichloroethene	15	14	6.9%
	1,2-Dichloroethene (T)	4.1	4.0	AC
	1,1,1-Trichloroethane	2.7	1.0 U	AC
	Trichloroethene	190	190	0.0%
GM-31M / DUP05	MBE	0.34 J	10 U	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X	X		
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate(LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)	X				X
Matrix Spike Duplicate(MSD)	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
GM-32	1,4-Dioxane	Detected sample results >RL and <BAL	"UB" at detected sample concentration

Note:

RL Reporting limit

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
GM-21M / DUP04	1,4-Dioxane	3.1	3.6	14.9%

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks		X	X		
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010, 300.0, 314.0, and SM5310 B-2011. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 2004. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010	Water	180 days from collection to analysis	Preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Matrix Spike (MS) and Matrix Spike Duplicate(MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD performed on sample GM-2B exhibited recoveries and RPDs within the control limits.

3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

A laboratory duplicate was not included in the data package.

4 Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
GM-21M / DUP04	Dissolved Iron	150	150	0.0%

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METAL

METALS; SW-846 6010/7470	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Total vs. Dissolved	X				X
Reporting Limit Verification		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Perchlorate by EPA 314.0	Water	28 days from collection to analysis	Cool to <6 °C.
Sulfate by EPA 300.0	Water	28 days from collection to analysis	Cool to <6 °C.
TOC by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved with H_2SO_4

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Matrix Spike (MS) and Matrix Spike Duplicate (MSD)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSDs performed on sample location GM-21M for perchlorate and TOC exhibited recoveries and RPDs within the control limits.

4.1 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
GM-21M / DUP04	Perchlorate	220	210	4.7%

Notes:

AC = Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA 314, 300 and SM5310B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X	X		
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R - percent recovery
RPD - relative percent difference,

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE:

DATE: May 21, 2019

PEER REVIEW: Joseph C. Houser

DATE: May 28, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

ARCADIS Design & Consultancy for natural and built assets

ATK – Elkton

DATA REVIEW

Elkton, MD

Volatile, Semivolatile, Metals and Miscellaneous Analyses

SDG #680-166627-1

Analyses Performed By:
Test America

Savannah, GA, Edison, NJ and Pheonix, AZ

Report #32810R
Review Level: Tier II
Project: MD001106.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #680-166627-1 for samples collected in association with the ATK Elkton site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
					VOC	SVOC	PCB	MET	MISC
SW7B (032719)	680-166627-1	Water	3/27/2019		X	X			X
SW6D (032719)	680-166627-2	Water	3/27/2019		X	X			X
PW6D (032719)	680-166627-3	Water	3/27/2019		X	X		X	X
SW6C (032719)	680-166627-4	Water	3/27/2019		X	X			X
PW6C (032719)	680-166627-5	Water	3/27/2019		X	X		X	X
SW6B (032719)	680-166627-6	Water	3/27/2019		X	X			X
PW2B (032719)	680-166627-7	Water	3/27/2019		X	X		X	X
SW2B (032719)	680-166627-8	Water	3/27/2019		X	X		X	X
SW1C (032719)	680-166627-9	Water	3/27/2019		X	X		X	X
DUP06 (032719)	680-166627-10	Water	3/27/2019	SW2B (032719)	X	X		X	X
EB-03 (032719)	680-166627-11	Water	3/27/2019		X	X			X
TRIP BLANK(03272019)	680-166627-12	Water	3/27/2019		X				

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8270D (SIM). All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 1999. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260	Water	14 days from collection to analysis (preserved) 7 days from collection to analysis (non-preserved)	Cool to <6 °C; preserved to a pH of less than 2 s.u.

Note:

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Note: 2-Chloroethyl vinyl ether degrades in the presence of acid. Since the sample was preserved with acid to a pH of less than 2, the results for 2-chloroethyl vinyl ether were rejected.

A MS/MSD was not included in the data package.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
SW7B SW6D PW6D SW6C	Bromomethane	>UL	>UL
PW6C SW6B PW2B SW2B	1,1-Dichloroethene	AC	>UL
DUP06 EB-03 Trip Blank	Bromomethane	<LL but >10%	AC

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Note:
Sample results were not qualified as rejected (R) due to the deviations listed above.

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
DUP06 EB-03 Trip Blank	Hexachlorobutadiene
	Vinyl Acetate
	2,2-Dichloropropane

The criteria used to evaluate the RPD between the LCS/LCSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
SW2B / DUP06	All VOCs	U	U	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X	X		
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)	X				X
Matrix Spike Duplicate(MSD)	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

The analyses that exceeded the holding are presented in the following table.

Sample Locations	Holding Time	Criteria
SW2B SW1C DUP06	Extraction Completed 13 days	<7 days

Sample results associated with sample locations analyzed by analytical method SW-846 8270 for the compounds 4-chloroaniline, hexachlorocyclopentadiene and phenol due to a re-extraction and re-analysis were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
DUP06	Phenol-d6	<LL but >10%
	2-Fluorophenol	<LL but >10%
	2,4,6-Tribromophenol	AC
	Nitrobenzene-d5	<LL but >10%
	2-Fluorobiphenyl	AC
	Terphenyl-d14	AC

Notes:

LL Lower control limit

AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	J[1]
	Detect	

Note:

[1] A more concentrated analysis was not performed with surrogate compounds within the calibration range; therefore, no determination of extraction efficiency could be made.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established

acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
PW2B	Acenaphthene	<LL but >10%	<LL but >10%
	Acenaphthylene	<LL but >10%	<LL but >10%
	Anthracene	<LL but >10%	AC
	Atrazine	<LL but >10%	<LL but >10%
	1,1-Biphenyl	<LL but >10%	<LL but >10%
	Bis(2-chloroethoxy)methane	<LL but >10%	<LL but >10%
	Bis(2-chloroethyl)ether	<LL but >10%	<LL but >10%
	Bis(2-chloroisopropyl)ether	<LL but >10%	AC
	4-Bromophenyl phenyl ether	<LL but >10%	<LL but >10%
	Caprolactum	<LL but >10%	<LL but >10%
	Carbazole	<LL but >10%	<LL but >10%
	4-Chloroaniline	<10%	<10%
	4-Chloro-3-Methylphenol	<LL but >10%	<LL but >10%
	2-Chloronaphthalene	<LL but >10%	<LL but >10%
	2-Chlorophenol	<LL but >10%	<LL but >10%
	4-Chlorophenyl phenyl ether	<LL but >10%	AC
	Dibenzofuran	<LL but >10%	<LL but >10%
	1,2-Dichlorobenzene	<LL but >10%	<LL but >10%
	1,3-Dichlorobenzene	<LL but >10%	<LL but >10%
	1,4-Dichlorobenzene	<LL but >10%	<LL but >10%
	3,3-Dichlorobenzidine	<10%	<10%
	2,4-Dichlorophenol	<LL but >10%	<LL but >10%
	Diethyl phthalate	<LL but >10%	<LL but >10%
	2,4-Dimethylphenol	<LL but >10%	<LL but >10%
	Dimethyl phthalate	<LL but >10%	<LL but >10%
	4,6-Dinitro-2-methylphenol	<LL but >10%	<LL but >10%

Sample Locations	Compound	MS Recovery	MSD Recovery
PW2B	2,4-Dinitrophenol	<LL but >10%	<LL but >10%
	2,4-Dinitrotoluene	<LL but >10%	<LL but >10%
	2,6-Dinitrotoluene	<LL but >10%	<LL but >10%
	Fluorene	<LL but >10%	<LL but >10%
	Hexachlorobenzene	<LL but >10%	<LL but >10%
	Hexachlorobutadiene	<LL but >10%	<LL but >10%
	Hexachlorocyclopentadiene	<10%	<10%
	Hexachloroethane	<LL but >10%	<LL but >10%
	Isophorone	<LL but >10%	<LL but >10%
	2-Methylnaphthalene	<LL but >10%	<LL but >10%
	2-Methylphenol	<LL but >10%	<LL but >10%
	3 & 4-Methylphenol	<LL but >10%	<LL but >10%
	2-Nitroaniline	<LL but >10%	<LL but >10%
	3-Nitroaniline	<LL but >10%	<LL but >10%
	4-Nitroaniline	<LL but >10%	<LL but >10%
	Nitrobenzene	<LL but >10%	<LL but >10%
	2-Nitrophenol	<LL but >10%	<LL but >10%
	4-Nitrophenol	<LL but >10%	<LL but >10%
	N-Nitrosodi-n-propylamine	<LL but >10%	<LL but >10%
	N-Nitrosodiphenylamine	<LL but >10%	<LL but >10%
	Phenanthrene	<LL but >10%	<LL but >10%
	Phenol	<LL but >10%	<LL but >10%
	1,2,4-Trichlorobenzene	<LL but >10%	<LL but >10%
	2,4,5-Trichlorophenol	<LL but >10%	<LL but >10%
	2,4,6-Trichlorophenol	<LL but >10%	<LL but >10%

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
All field samples	1,4-Dioxane

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery
PW2B	4-Chloroaniline	<10%
	Hexachlorocyclopentadiene	<10%
	Phenol	<10%
All Field Samples	Acenaphthene	<LL but >10%
	Acenaphthylene	<LL but >10%
	Anthracene	<LL but >10%

Sample Locations	Compound	LCS Recovery
All Field Samples	Atrazine	<LL but >10%
	1,1-Biphenyl	<LL but >10%
	Bis(2-chloroethoxy)methane	<LL but >10%
	Bis(2-chloroethyl)ether	<LL but >10%
	Bis(2-chloroisopropyl)ether	<LL but >10%
	4-Bromophenyl phenyl ether	<LL but >10%
	Caprolactum	<LL but >10%
	4-Chloro-3-methylphenol	<LL but >10%
	2-Chloronaphthalene	<LL but >10%
	2-Chlorophenol	<LL but >10%
	4-Chlorophenyl phenyl ether	<LL but >10%
	Dibenzofuran	<LL but >10%
	1,2-Dichlorobenzene	<LL but >10%
	1,3-Dichlorobenzene	<LL but >10%
	1,4-Dichlorobenzene	<LL but >10%
	2,4-Dichlorophenol	<LL but >10%
	Diethyl phthalate	<LL but >10%
	2,4-Dimethylphenol	<LL but >10%
	Dimethyl phthalate	<LL but >10%
	2,4-Dinitrotoluene	<LL but >10%
	2,6-Dinitrotoluene	<LL but >10%
	Fluorene	<LL but >10%
	Hexachlorobenzene	<LL but >10%
	Hexachloroethane	<LL but >10%
	Isophorone	<LL but >10%
	2-Methylnaphthalene	<LL but >10%
	2-Methylphenol	<LL but >10%
	3 & 4-Methylphenol	<LL but >10%
	2-Nitroaniline	<LL but >10%
	3-Nitroaniline	<LL but >10%
	4-Nitroaniline	<LL but >10%
	Nitrobenzene	<LL but >10%
	2-Nitrophenol	<LL but >10%

Sample Locations	Compound	LCS Recovery
All Field Samples	N-Nitrosodi-n-propylamine	<LL but >10%
	N-Nitrosodiphenylamine	<LL but >10%
	Phenanthrene	<LL but >10%
	1,2,4-Trichlorobenzene	<LL but >10%
	2,4,5-Trichlorophenol	<LL but >10%
	2,4,6-Trichlorophenol	<LL but >10%

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
SW2B / DUP06	All SVOCs	U	U	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 6010, 300.0, 314.0, and SM5310 B-2011. All samples in this data set were reviewed in accordance with USEPA National Functional Guidelines of October 2004. Formerly, this project was reviewed under the *USEPA Region III Innovative Approaches to Data Validation (June 1995)*. However, these Region III guidelines are no longer used for data validation by USEPA region III. Therefore, in compliance with Region III USEPA regulators, the data that formerly were reviewed with the Region III guidelines will now be validated using the National Functional Guidelines.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.

  J The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within control limits.

  * Duplicate analysis is not within control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

METALS ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 6010	Water	180 days from collection to analysis	Preserved to a pH of less than 2.
SW-846 7470	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All analytes associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the analytes listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) from the data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
DUP06 PW2B SW1C	Mercury	Detected sample results <RL and <BAL	"UB" at the RL

Note:

RL = reporting limit

3. Matrix Spike (MS) and Matrix Spike Duplicate(MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations

where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

A MS/MSD was not included in the data package.

3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

A laboratory duplicate was not included in the data package.

4 Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
SW2B / DUP06	Aluminum	55 J	58 J	AC
	Barium	36	36	0%
	Calcium	13000	13000	0%
	Iron	140	160	13.3%
	Magnesium	8000	8200	2.5%
	Manganese	30	31	3.3%
	Potassium	2000	2100	4.9%
	Sodium	15000	15000	0%
	Nickel	40 U	31 J	AC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR METAL

METALS; SW-846 6010/7470	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)					
Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X	X		
C. Equipment/Field Blanks	X				X
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Total vs. Dissolved		X		X	
Reporting Limit Verification		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Perchlorate by EPA 314.0	Water	28 days from collection to analysis	Cool to <6 °C.
Sulfate by EPA 300.0	Water	28 days from collection to analysis	Cool to <6 °C.
TOC by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved with H_2SO_4

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Matrix Spike (MS) and Matrix Spike Duplicate (MSD)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

3.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSDs performed on sample locations DUP06 and PW6D for perchlorate exhibited recoveries and RPDs within the control limits.

4.1 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the

parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

MS/MSD analysis was performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW2B / DUP06	Perchlorate	0.80 J	0.83 J	AC

Notes:

AC = Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS/LCSD analysis must exhibit a percent recovery between the control limits of 80% and 120%.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA 314, 300 and SM5310B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R - percent recovery
RPD - relative percent difference,

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE:

DATE: May 24, 2019

PEER REVIEW: Joseph C. Houser

DATE: May 28, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Baltimore #201

Chain of Custody Record

309996

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Tina Armstrong	Site Contact: Rich Zambito	Date: 3/27/19	COC No:
Company Name: Arcadis Inc	Tel/Fax:	Lab Contact: Jerry Lanier	Carrier:	1 of 1 COCs
Address: 7550 Teague Road Suite 210	Analysis Turnaround Time			Sampler:
City/State/Zip: Hanover, MD 21076	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: ATK Orbital	☐ 1 week			
Site: Elkton, MD	☐ 2 days			Job / SDG No.:
PO # MD001006.0006	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260B - VOCs	3140 - Perchlorate	8270D_Sim - Dioxane	SM5310_TOC_B	6010C - Dissolved Iron	300 - ORGFM_28D	8270D - SVOC	6010C - Total Metals	Sample Specific Notes:
SW7B(032719)	03/27/19	1200	G	W	6			3	1	2						
SW6D(032719)		1130	G	W	6			3	1	2						
PW6D(032719)		1045	G	W	11			3	1	2		3	1	1		
SW6C(032719)		1115	G	W	6			3	1	2						
PW6C(032719)		1030	G	W	11			3	1	2		3	1	1		
SW6B(032719)		1100	G	W	6			3	1	2						
PW2B(032719)		0900	G	W	12			3	1			3	1	1	2	1
SW2B(032719)		0910	G	W	7			3	1						2	1
SW1C(032719)		0820	G	W	7			3	1						2	1
DUP06(032719)		0800	G	W	7			3	1						2	1
EB-03(032719)		—	G	W	14			6	4	4						

680-166627 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 3 coolers 1.3/1.5, 2.5/3.0 CUI225

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:

	Company	Date/Time	Received by:	Company	Date/Time
Relinquished by:	Arcadis			TA	3/28/19 1610
Relinquished by:	TA 3/28/19	1700	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA STL	Date/Time: 3/29/19 901

4/18/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560008.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 777 New Durham Road, ,	Due Date Requested: 4/10/2019			
City: Edison	TAT Requested (days):			
State, Zip: NJ, 08817				
Phone: 732-549-3900(Tel) 732-549-3679(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270D_SIM/3510C_LVI (MOD) 8270C SIM PAH List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SW7B (032719) (680-166627-1)	3/27/19	12:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6D (032719) (680-166627-2)	3/27/19	11:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
PW6D (032719) (680-166627-3)	3/27/19	10:45 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6C (032719) (680-166627-4)	3/27/19	11:15 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
PW6C (032719) (680-166627-5)	3/27/19	10:30 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
SW6B (032719) (680-166627-6)	3/27/19	11:00 Eastern		Water			X	2	1,4 dioxane has been added. Make sure it is spiked
EB-03 (032719) (680-166627-11)	3/27/19	Eastern		Water			X	4	1,4 dioxane has been added. Make sure it is spiked

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4.1.19 1521		[signature] via FedEx	4/2/19 0905	TAEsi
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: X Yes Δ No	Custody Seal No.: 700343	Cooler Temperature(s) °C and Other Remarks: 4.2°C IR9

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560047.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/10/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SW7B (032719) (680-166627-1)	3/27/19	12:00 Eastern		Water			X	1	
SW6D (032719) (680-166627-2)	3/27/19	11:30 Eastern		Water			X	1	
PW6D (032719) (680-166627-3)	3/27/19	10:45 Eastern		Water			X	1	
SW6C (032719) (680-166627-4)	3/27/19	11:15 Eastern		Water			X	1	
PW6C (032719) (680-166627-5)	3/27/19	10:30 Eastern		Water			X	1	
SW6B (032719) (680-166627-6)	3/27/19	11:00 Eastern		Water			X	1	
PW2B (032719) (680-166627-7)	3/27/19	09:00 Eastern		Water			X	1	
SW2B (032719) (680-166627-8)	3/27/19	09:10 Eastern		Water			X	1	
SW1C (032719) (680-166627-9)	3/27/19	08:20 Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 4.2.19 0858	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: TA-PHX	Date/Time: 09:20	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 04-03-19	Company TA Phx

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		Temp 4.2-C

Ver: 01/16/2019

TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-560047.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Maryland	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Maryland		Job #: 680-166627-1
Address: 4625 East Cotton Ctr Blvd, Suite 189,	Due Date Requested: 4/10/2019			
City: Phoenix	TAT Requested (days):			
State, Zip: AZ, 85040				
Phone: 602-437-3340(Tel) 602-454-9303(Fax)	PO #:			
Email:	WO #:			
Project Name: ATK Orbital Elkton	Project #: 68012765			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	314.0/ Perchlorate	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
DUP06 (032719) (680-166627-10)	3/27/19	08:00 Eastern		Water			X	1	
EB-03 (032719) (680-166627-11)	3/27/19	Eastern		Water			X	4	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		4.2.19 0858				
2				TA-PHX		
3					04-05-19 09:20	TA-PHX

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

4/18/2019

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW7B (032719)
Date Collected: 03/27/19 12:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 17:09	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 17:09	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 17:09	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 17:09	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 17:09	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 17:09	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 17:09	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 17:09	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 17:09	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 17:09	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 17:09	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 17:09	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 17:09	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 17:09	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 17:09	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 17:09	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 17:09	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 17:09	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 17:09	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 17:09	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 17:09	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 17:09	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 17:09	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 17:09	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 17:09	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 17:09	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:09	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 17:09	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 17:09	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 17:09	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 17:09	1

Client Sample ID: SW7B (032719)
Date Collected: 03/27/19 12:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 17:09	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 17:09	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 17:09	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 17:09	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:09	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:09	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 17:09	1
Trichloroethene	**4.7**		1.0	0.48	ug/L			04/09/19 17:09	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 17:09	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 17:09	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:09	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 17:09	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 17:09	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 17:09	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/09/19 17:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*85*		*73 - 131*		*04/09/19 17:09*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 17:09*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*04/09/19 17:09*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	UJ	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 21:57	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 21:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*96*		*38 - 125*	*04/03/19 09:50*	*04/03/19 21:57*	*1*
Terphenyl-d14	*88*		*70 - 130*	*04/03/19 09:50*	*04/03/19 21:57*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**2.0**		1.0	0.31	ug/L			04/10/19 23:14	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6D (032719)
Date Collected: 03/27/19 11:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 17:37	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 17:37	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 17:37	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 17:37	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 17:37	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 17:37	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 17:37	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 17:37	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
cis-1,2-Dichloroethene	**14**		1.0	0.41	ug/L			04/09/19 17:37	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 17:37	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 17:37	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 17:37	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 17:37	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 17:37	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 17:37	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 17:37	1
1,1-Dichloroethane	**1.1**		1.0	0.38	ug/L			04/09/19 17:37	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 17:37	1
1,1-Dichloroethene	**16**	J	1.0	0.36	ug/L			04/09/19 17:37	1
1,2-Dichloroethene, Total	**14**		2.0	0.37	ug/L			04/09/19 17:37	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 17:37	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 17:37	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 17:37	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 17:37	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 17:37	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 17:37	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 17:37	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:37	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 17:37	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 17:37	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 17:37	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 17:37	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6D (032719)
Date Collected: 03/27/19 11:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 17:37	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 17:37	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 17:37	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 17:37	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 17:37	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 17:37	1
1,1,1-Trichloroethane	**5.4**		1.0	0.37	ug/L			04/09/19 17:37	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 17:37	1
Trichloroethene	**24**		1.0	0.48	ug/L			04/09/19 17:37	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 17:37	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 17:37	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 17:37	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 17:37	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 17:37	1
Vinyl chloride	**1.1**		1.0	0.50	ug/L			04/09/19 17:37	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 17:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*04/09/19 17:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*		*04/09/19 17:37*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/09/19 17:37*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*04/09/19 17:37*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.6**	J	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 22:18	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 22:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*107*		*38 - 125*	*04/03/19 09:50*	*04/03/19 22:18*	*1*
Terphenyl-d14	*98*		*70 - 130*	*04/03/19 09:50*	*04/03/19 22:18*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**4.4**		1.0	0.31	ug/L			04/10/19 23:37	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6D (032719)
Date Collected: 03/27/19 10:45
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:03	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:03	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:03	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:03	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:03	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 18:03	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:03	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:03	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
cis-1,2-Dichloroethene	**8.3**		1.0	0.41	ug/L			04/09/19 18:03	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:03	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:03	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:03	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:03	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:03	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:03	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:03	1
1,1-Dichloroethane	**2.1**		1.0	0.38	ug/L			04/09/19 18:03	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 18:03	1
1,1-Dichloroethene	**37**	J	1.0	0.36	ug/L			04/09/19 18:03	1
1,2-Dichloroethene, Total	**8.3**		2.0	0.37	ug/L			04/09/19 18:03	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:03	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:03	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:03	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:03	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:03	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:03	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:03	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:03	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:03	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:03	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:03	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:03	1

Client Sample ID: PW6D (032719)
Date Collected: 03/27/19 10:45
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:03	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:03	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:03	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:03	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:03	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:03	1
1,1,1-Trichloroethane	**11**		1.0	0.37	ug/L			04/09/19 18:03	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:03	1
Trichloroethene	**160**		1.0	0.48	ug/L			04/09/19 18:03	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:03	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:03	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:03	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:03	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:03	1
Vinyl chloride	**2.0**		1.0	0.50	ug/L			04/09/19 18:03	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/09/19 18:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 18:03*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 18:03*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 18:03*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.7**	J	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 22:40	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 22:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*106*		*38 - 125*	*04/03/19 09:50*	*04/03/19 22:40*	*1*
Terphenyl-d14	*97*		*70 - 130*	*04/03/19 09:50*	*04/03/19 22:40*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**15**		1.0	0.40	mg/L			04/11/19 20:17	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**57**		10	3.1	ug/L			04/13/19 01:59	10

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**270**		50	17	ug/L		04/04/19 13:37	04/10/19 22:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.1**		1.0	0.50	mg/L			04/13/19 21:46	1

Client Sample ID: SW6C (032719)
Date Collected: 03/27/19 11:15
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:29	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:29	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:29	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:29	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:29	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 18:29	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:29	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:29	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 18:29	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:29	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:29	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:29	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:29	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:29	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:29	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:29	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 18:29	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 18:29	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 18:29	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:29	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:29	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:29	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:29	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:29	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:29	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:29	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:29	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:29	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:29	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:29	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:29	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6C (032719)
Date Collected: 03/27/19 11:15
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:29	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:29	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:29	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:29	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:29	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:29	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:29	1
Trichloroethene	**4.6**		1.0	0.48	ug/L			04/09/19 18:29	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:29	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:29	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:29	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:29	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:29	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 18:29	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/09/19 18:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 18:29*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 18:29*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 18:29*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	UJ	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:01	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:01*	*1*
Terphenyl-d14	*90*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:01*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.5**		1.0	0.31	ug/L			04/11/19 00:23	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 18:54	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 18:54	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 18:54	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 18:54	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 18:54	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 18:54	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 18:54	1
Chloroform	**0.65**	**J**	1.0	0.50	ug/L			04/09/19 18:54	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 18:54	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 18:54	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
cis-1,2-Dichloroethene	**8.1**		1.0	0.41	ug/L			04/09/19 18:54	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 18:54	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 18:54	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 18:54	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 18:54	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 18:54	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 18:54	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 18:54	1
1,1-Dichloroethane	**3.5**		1.0	0.38	ug/L			04/09/19 18:54	1
1,2-Dichloroethane	**0.61**	**J**	1.0	0.50	ug/L			04/09/19 18:54	1
1,1-Dichloroethene	**77**	J	1.0	0.36	ug/L			04/09/19 18:54	1
1,2-Dichloroethene, Total	**8.1**		2.0	0.37	ug/L			04/09/19 18:54	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 18:54	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 18:54	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 18:54	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 18:54	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 18:54	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 18:54	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 18:54	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:54	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 18:54	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 18:54	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 18:54	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 18:54	1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 18:54	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 18:54	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 18:54	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 18:54	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 18:54	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 18:54	1
1,1,1-Trichloroethane	**27**		1.0	0.37	ug/L			04/09/19 18:54	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 18:54	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 18:54	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 18:54	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 18:54	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 18:54	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 18:54	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 18:54	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 18:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 18:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*73 - 131*		*04/09/19 18:54*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 18:54*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*04/09/19 18:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**370**		5.0	2.4	ug/L			04/10/19 12:47	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*80 - 120*		*04/10/19 12:47*	*5*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*		*04/10/19 12:47*	*5*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*04/10/19 12:47*	*5*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*04/10/19 12:47*	*5*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4.7**	* J	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:22	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*107*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:22*	*1*
Terphenyl-d14	*95*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:22*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**17**		1.0	0.40	mg/L			04/11/19 20:30	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**28**		1.0	0.31	ug/L			04/11/19 00:46	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW6C (032719)
Date Collected: 03/27/19 10:30
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	<50		50	17	ug/L		04/04/19 13:37	04/10/19 21:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	2.0		1.0	0.50	mg/L			04/13/19 22:03	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW6B (032719)
Date Collected: 03/27/19 11:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:20	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:20	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 19:20	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:20	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:20	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:20	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 19:20	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:20	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:20	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:20	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:20	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:20	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:20	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:20	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:20	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:20	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:20	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:20	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
1,1-Dichloroethene	<1.0	*	1.0	0.36	ug/L			04/09/19 19:20	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:20	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:20	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:20	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:20	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:20	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:20	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:20	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:20	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:20	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:20	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:20	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:20	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:20	1

Client Sample ID: SW6B (032719)
Date Collected: 03/27/19 11:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:20	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:20	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:20	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:20	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:20	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:20	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:20	1
Trichloroethene	**3.8**		1.0	0.48	ug/L			04/09/19 19:20	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:20	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:20	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:20	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:20	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:20	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 19:20	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 19:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 19:20*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 122*		*04/09/19 19:20*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 19:20*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	UJ	0.40	0.17	ug/L		04/03/19 09:50	04/03/19 23:43	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/03/19 23:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*100*		*38 - 125*	*04/03/19 09:50*	*04/03/19 23:43*	*1*
Terphenyl-d14	*92*		*70 - 130*	*04/03/19 09:50*	*04/03/19 23:43*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**1.6**		1.0	0.31	ug/L			04/11/19 01:08	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:46	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:46	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
Bromomethane	<5.0	*	5.0	2.5	ug/L			04/09/19 19:46	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:46	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:46	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:46	1
Chloroethane	**2.8**	**J**	5.0	2.5	ug/L			04/09/19 19:46	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 19:46	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:46	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:46	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:46	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:46	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:46	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:46	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:46	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:46	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:46	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:46	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:46	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:46	1
1,1-Dichloroethene	**19**	* J	1.0	0.36	ug/L			04/09/19 19:46	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:46	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:46	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:46	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:46	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:46	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:46	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:46	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:46	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:46	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:46	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:46	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:46	1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:46	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:46	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:46	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:46	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:46	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:46	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 19:46	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:46	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:46	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:46	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:46	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:46	1
Vinyl chloride	**1.5**		1.0	0.50	ug/L			04/09/19 19:46	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/09/19 19:46*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 19:46*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 122*		*04/09/19 19:46*	*1*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*04/09/19 19:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	* F1 UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
Acenaphthylene	<9.9	* F1	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 19:57	1
Acetophenone	<9.9	* F1	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 19:57	1
Anthracene	<9.9	* F1	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 19:57	1
Atrazine	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[a]anthracene	<9.9		9.9	0.55	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 19:57	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,1'-Biphenyl	<9.9	* F1 UJ	9.9	0.58	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-chloroethoxy)methane	<9.9	* F1	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-chloroethyl)ether	<9.9	* F1	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
bis (2-chloroisopropyl) ether	<9.9	* F1	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 19:57	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Bromophenyl phenyl ether	<9.9	* F1 UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 19:57	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
Caprolactam	<9.9	* F1 UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
Carbazole	<9.9	F1 UJ	9.9	0.70	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chloroaniline	<20	* F1 R	20	2.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chloro-3-methylphenol	<9.9	* F1 UJ	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1

Client Sample ID: PW2B (032719)
Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	* F1 UJ	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Chlorophenol	<9.9	* F1	9.9	0.86	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Chlorophenyl phenyl ether	<9.9	* F1	9.9	0.83	ug/L		04/02/19 11:58	04/03/19 19:57	1
Chrysene	<9.9		9.9	0.51	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dibenzofuran	<9.9	* F1 UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,2-Dichlorobenzene	<9.9	* F1	9.9	0.53	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,3-Dichlorobenzene	<9.9	* F1	9.9	0.59	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,4-Dichlorobenzene	<9.9	* F1	9.9	0.54	ug/L		04/02/19 11:58	04/03/19 19:57	1
3,3'-Dichlorobenzidine	<60	F1 R	60	30	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dichlorophenol	<9.9	* F1 UJ	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Diethyl phthalate	<9.9	* F1	9.9	0.87	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dimethylphenol	<9.9	* F1	9.9	4.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Dimethyl phthalate	<9.9	* F1	9.9	0.98	ug/L		04/02/19 11:58	04/03/19 19:57	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 19:57	1
4,6-Dinitro-2-methylphenol	<50	F1 UJ	50	9.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dinitrophenol	<50	F1	50	9.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4-Dinitrotoluene	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,6-Dinitrotoluene	<9.9	* F1	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 19:57	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 19:57	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 19:57	1
Fluorene	<9.9	* F1 UJ	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorobenzene	<9.9	* F1	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorobutadiene	<9.9	* F1	9.9	0.62	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachlorocyclopentadiene	<9.9	* F1 R	9.9	2.5	ug/L		04/02/19 11:58	04/03/19 19:57	1
Hexachloroethane	<9.9	* F1 UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 19:57	1
Isophorone	<9.9	* F1 UJ	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Methylnaphthalene	<9.9	* F1	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Methylphenol	<9.9	* F1	9.9	0.88	ug/L		04/02/19 11:58	04/03/19 19:57	1
3 & 4 Methylphenol	<9.9	* F1	9.9	1.3	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Nitroaniline	<50	* F1	50	1.3	ug/L		04/02/19 11:58	04/03/19 19:57	1
3-Nitroaniline	<50	* F1	50	5.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Nitroaniline	<50	* F1	50	5.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Nitrobenzene	<9.9	* F1	9.9	0.72	ug/L		04/02/19 11:58	04/03/19 19:57	1
2-Nitrophenol	<9.9	* F1	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 19:57	1
4-Nitrophenol	<50	F1	50	1.9	ug/L		04/02/19 11:58	04/03/19 19:57	1
N-Nitrosodi-n-propylamine	<9.9	* F1	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 19:57	1
N-Nitrosodiphenylamine	<9.9	* F1	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 19:57	1
Pentachlorophenol	<50		50	2.0	ug/L		04/02/19 11:58	04/03/19 19:57	1
Phenanthrene	<9.9	* F1 UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 19:57	1
Phenol	<9.9	* F1 R	9.9	0.82	ug/L		04/02/19 11:58	04/03/19 19:57	1
Pyrene	<9.9		9.9	0.63	ug/L		04/02/19 11:58	04/03/19 19:57	1
1,2,4-Trichlorobenzene	<9.9	* F1 UJ	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4,5-Trichlorophenol	<9.9	* F1	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 19:57	1
2,4,6-Trichlorophenol	<9.9	* F1	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 19:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*62*		*32 - 113*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/02/19 11:58*	*04/03/19 19:57*	*1*

Client Sample ID: PW2B (032719)

Date Collected: 03/27/19 09:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-7

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*62*		*32 - 118*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
Phenol-d5	*54*		*27 - 110*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
Terphenyl-d14	*42*		*10 - 126*	*04/02/19 11:58*	*04/03/19 19:57*	*1*
2,4,6-Tribromophenol	*79*		*39 - 124*	*04/02/19 11:58*	*04/03/19 19:57*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**9.9**		1.0	0.40	mg/L			04/11/19 20:43	1

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.42**	**J**	1.0	0.31	ug/L			04/11/19 01:31	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2000**		200	24	ug/L		04/04/19 13:37	04/10/19 21:46	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:46	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:46	1
Barium	**64**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:46	1
Beryllium	**0.16**	**J**	4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:46	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Calcium	**7800**		500	25	ug/L		04/04/19 13:37	04/10/19 21:46	1
Chromium	**12**		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:46	1
Cobalt	**12**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Copper	**3.4**	**J**	20	1.8	ug/L		04/04/19 13:37	04/10/19 21:46	1
Iron	**12000**		50	17	ug/L		04/04/19 13:37	04/10/19 21:46	1
Lead	**7.8**	**J**	10	3.9	ug/L		04/04/19 13:37	04/10/19 21:46	1
Magnesium	**5100**		500	33	ug/L		04/04/19 13:37	04/10/19 21:46	1
Manganese	**820**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Nickel	**21**	**J**	40	2.1	ug/L		04/04/19 13:37	04/10/19 21:46	1
Potassium	**900**	**J**	1000	17	ug/L		04/04/19 13:37	04/10/19 21:46	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:46	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:46	1
Sodium	**12000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:46	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Vanadium	**5.1**	**J**	10	1.0	ug/L		04/04/19 13:37	04/10/19 21:46	1
Zinc	**28**		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:46	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Iron	**9900**		50	17	ug/L		04/04/19 13:37	04/10/19 22:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	.2 ~~0.12~~	~~J B~~ UB	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	**1.7**		1.0	0.50	mg/L			04/13/19 22:20	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 20:11	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 20:11	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 20:11	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 20:11	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 20:11	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 20:11	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 20:11	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 20:11	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 20:11	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 20:11	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 20:11	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 20:11	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 20:11	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 20:11	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 20:11	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 20:11	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 20:11	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 20:11	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 20:11	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 20:11	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 20:11	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 20:11	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 20:11	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 20:11	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 20:11	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 20:11	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 20:11	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 20:11	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 20:11	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 20:11	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 20:11	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 20:11	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 20:11	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 20:11	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 20:11	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 20:11	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 20:11	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 20:11	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 20:11	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 20:11	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 20:11	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 20:11	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 20:11	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/09/19 20:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*73 - 131*		*04/09/19 20:11*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 122*		*04/09/19 20:11*	*1*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*		*04/09/19 20:11*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	* UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
Acenaphthylene	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:21	1
Acetophenone	<9.9	*	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 20:21	1
Anthracene	<9.9	*	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 20:21	1
Atrazine	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[a]anthracene	<9.9		9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:21	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,1'-Biphenyl	<9.9	* UJ	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-chloroethoxy)methane	<9.9	*	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-chloroethyl)ether	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
bis (2-chloroisopropyl) ether	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:21	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Bromophenyl phenyl ether	<9.9	* UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:21	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
Caprolactam	<9.9	* UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
Carbazole	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chloroaniline	<20	*	20	2.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chloro-3-methylphenol	<9.9	* UJ	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	UJ	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Chlorophenol	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Chlorophenyl phenyl ether	<9.9		9.9	0.83	ug/L		04/02/19 11:58	04/03/19 20:21	1
Chrysene	<9.9		9.9	0.50	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dibenzofuran	<9.9	UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,2-Dichlorobenzene	<9.9		9.9	0.52	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,3-Dichlorobenzene	<9.9		9.9	0.58	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,4-Dichlorobenzene	<9.9		9.9	0.53	ug/L		04/02/19 11:58	04/03/19 20:21	1
3,3'-Dichlorobenzidine	<59		59	30	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dichlorophenol	<9.9	UJ	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Diethyl phthalate	<9.9		9.9	0.87	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dimethylphenol	<9.9		9.9	3.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
Dimethyl phthalate	<9.9		9.9	0.98	ug/L		04/02/19 11:58	04/03/19 20:21	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:21	1
4,6-Dinitro-2-methylphenol	<49		49	9.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dinitrophenol	<49		49	9.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4-Dinitrotoluene	<9.9	UJ	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,6-Dinitrotoluene	<9.9	UJ	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:21	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 20:21	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 20:21	1
Fluorene	<9.9	UJ	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorobenzene	<9.9		9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorobutadiene	<9.9		9.9	0.61	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachlorocyclopentadiene	<9.9		9.9	2.5	ug/L		04/02/19 11:58	04/03/19 20:21	1
Hexachloroethane	<9.9	UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:21	1
Isophorone	<9.9	UJ	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Methylnaphthalene	<9.9		9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Methylphenol	<9.9		9.9	0.88	ug/L		04/02/19 11:58	04/03/19 20:21	1
3 & 4 Methylphenol	<9.9		9.9	1.3	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Nitroaniline	<49		49	1.3	ug/L		04/02/19 11:58	04/03/19 20:21	1
3-Nitroaniline	<49		49	4.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Nitroaniline	<49		49	4.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
Nitrobenzene	<9.9		9.9	0.72	ug/L		04/02/19 11:58	04/03/19 20:21	1
2-Nitrophenol	<9.9		9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:21	1
4-Nitrophenol	<49		49	1.9	ug/L		04/02/19 11:58	04/03/19 20:21	1
N-Nitrosodi-n-propylamine	<9.9	UJ	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 20:21	1
N-Nitrosodiphenylamine	<9.9	UJ	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 20:21	1
Pentachlorophenol	<49		49	2.0	ug/L		04/02/19 11:58	04/03/19 20:21	1
Phenanthrene	<9.9	UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:21	1
Phenol	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:21	1
Pyrene	<9.9		9.9	0.62	ug/L		04/02/19 11:58	04/03/19 20:21	1
1,2,4-Trichlorobenzene	<9.9	UJ	9.9	0.55	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4,5-Trichlorophenol	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:21	1
2,4,6-Trichlorophenol	<9.9		9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*62*		*32 - 113*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/02/19 11:58*	*04/03/19 20:21*	*1*

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*64*		*32 - 118*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
Phenol-d5	*55*		*27 - 110*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
Terphenyl-d14	*24*		*10 - 126*	*04/02/19 11:58*	*04/03/19 20:21*	*1*
2,4,6-Tribromophenol	*73*		*39 - 124*	*04/02/19 11:58*	*04/03/19 20:21*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	H		9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
Acenaphthylene	<9.9	H		9.9	0.84	ug/L		04/09/19 15:03	04/10/19 22:49	1
Acetophenone	<9.9	H		9.9	0.56	ug/L		04/09/19 15:03	04/10/19 22:49	1
Anthracene	<9.9	H		9.9	0.68	ug/L		04/09/19 15:03	04/10/19 22:49	1
Atrazine	<9.9	H		9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzaldehyde	<9.9	H		9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[a]anthracene	<9.9	H		9.9	0.54	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[a]pyrene	<9.9	H		9.9	0.70	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[b]fluoranthene	<9.9	H		9.9	2.6	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[g,h,i]perylene	<9.9	H		9.9	0.86	ug/L		04/09/19 15:03	04/10/19 22:49	1
Benzo[k]fluoranthene	<9.9	H		9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,1'-Biphenyl	<9.9	H		9.9	0.57	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-chloroethoxy)methane	<9.9	H		9.9	0.93	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-chloroethyl)ether	<9.9	H		9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
bis (2-chloroisopropyl) ether	<9.9	H		9.9	0.77	ug/L		04/09/19 15:03	04/10/19 22:49	1
Bis(2-ethylhexyl) phthalate	<9.9	H		9.9	1.6	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Bromophenyl phenyl ether	<9.9	H		9.9	0.76	ug/L		04/09/19 15:03	04/10/19 22:49	1
Butyl benzyl phthalate	<9.9	H		9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
Caprolactam	<9.9	H		9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
Carbazole	<9.9	H		9.9	0.70	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chloroaniline	<20	H	UJ	20	2.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chloro-3-methylphenol	<9.9	H		9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Chloronaphthalene	<9.9	H		9.9	0.79	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Chlorophenol	<9.9	H		9.9	0.86	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Chlorophenyl phenyl ether	<9.9	H		9.9	0.83	ug/L		04/09/19 15:03	04/10/19 22:49	1
Chrysene	<9.9	H		9.9	0.50	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dibenz(a,h)anthracene	<9.9	H		9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dibenzofuran	<9.9	H		9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,2-Dichlorobenzene	<9.9	H		9.9	0.52	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,3-Dichlorobenzene	<9.9	H		9.9	0.58	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,4-Dichlorobenzene	<9.9	H		9.9	0.53	ug/L		04/09/19 15:03	04/10/19 22:49	1
3,3'-Dichlorobenzidine	<59	H		59	30	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dichlorophenol	<9.9	H		9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Diethyl phthalate	<9.9	H		9.9	0.87	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dimethylphenol	<9.9	H		9.9	3.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
Dimethyl phthalate	<9.9	H		9.9	0.98	ug/L		04/09/19 15:03	04/10/19 22:49	1
Di-n-butyl phthalate	<9.9	H		9.9	0.82	ug/L		04/09/19 15:03	04/10/19 22:49	1
4,6-Dinitro-2-methylphenol	<49	H		49	9.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dinitrophenol	<49	H		49	9.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4-Dinitrotoluene	<9.9	H		9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,6-Dinitrotoluene	<9.9	H		9.9	1.1	ug/L		04/09/19 15:03	04/10/19 22:49	1
Di-n-octyl phthalate	<9.9	H		9.9	1.4	ug/L		04/09/19 15:03	04/10/19 22:49	1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.9	H	9.9	0.73	ug/L		04/09/19 15:03	04/10/19 22:49	1
Fluorene	<9.9	H	9.9	0.95	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorobenzene	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorobutadiene	<9.9	H	9.9	0.61	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachlorocyclopentadiene	<9.9	H UJ	9.9	2.5	ug/L		04/09/19 15:03	04/10/19 22:49	1
Hexachloroethane	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
Indeno[1,2,3-cd]pyrene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 22:49	1
Isophorone	<9.9	H	9.9	0.89	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Methylnaphthalene	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Methylphenol	<9.9	H	9.9	0.88	ug/L		04/09/19 15:03	04/10/19 22:49	1
3 & 4 Methylphenol	<9.9	H	9.9	1.3	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 22:49	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
Nitrobenzene	<9.9	H	9.9	0.72	ug/L		04/09/19 15:03	04/10/19 22:49	1
2-Nitrophenol	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 22:49	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 22:49	1
N-Nitrosodi-n-propylamine	<9.9	H	9.9	0.71	ug/L		04/09/19 15:03	04/10/19 22:49	1
N-Nitrosodiphenylamine	<9.9	H	9.9	0.91	ug/L		04/09/19 15:03	04/10/19 22:49	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 22:49	1
Phenanthrene	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 22:49	1
Phenol	<9.9	H UJ	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 22:49	1
Pyrene	<9.9	H	9.9	0.62	ug/L		04/09/19 15:03	04/10/19 22:49	1
1,2,4-Trichlorobenzene	<9.9	H	9.9	0.55	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4,5-Trichlorophenol	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 22:49	1
2,4,6-Trichlorophenol	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*60*		*32 - 113*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
2-Fluorophenol	*48*		*26 - 109*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Nitrobenzene-d5	*61*		*32 - 118*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Phenol-d5	*46*		*27 - 110*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
Terphenyl-d14	*13*		*10 - 126*	*04/09/19 15:03*	*04/10/19 22:49*	*1*
2,4,6-Tribromophenol	*76*		*39 - 124*	*04/09/19 15:03*	*04/10/19 22:49*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.80**	**J**	1.0	0.31	ug/L			04/11/19 01:54	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**55**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:42	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:42	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:42	1
Barium	**36**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:42	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:42	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:42	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:42	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW2B (032719)
Date Collected: 03/27/19 09:10
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-8
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:42	1
Iron	**140**		50	17	ug/L		04/04/19 13:37	04/10/19 21:42	1
Lead	<10		10	3.9	ug/L		04/04/19 13:37	04/10/19 21:42	1
Magnesium	**8000**		500	33	ug/L		04/04/19 13:37	04/10/19 21:42	1
Manganese	**30**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Nickel	<40		40	2.1	ug/L		04/04/19 13:37	04/10/19 21:42	1
Potassium	**2000**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:42	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:42	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:42	1
Sodium	**15000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:42	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Vanadium	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:42	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:42	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:21	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/09/19 19:29	1
Benzene	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/09/19 19:29	1
Bromoform	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
Bromomethane	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Butanone	<10		10	3.4	ug/L			04/09/19 19:29	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/09/19 19:29	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/09/19 19:29	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/09/19 19:29	1
Chloroform	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/09/19 19:29	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/09/19 19:29	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/09/19 19:29	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/09/19 19:29	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/09/19 19:29	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/09/19 19:29	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/09/19 19:29	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/09/19 19:29	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/09/19 19:29	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/09/19 19:29	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/09/19 19:29	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/09/19 19:29	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/09/19 19:29	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/09/19 19:29	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/09/19 19:29	1
2,2-Dichloropropane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/09/19 19:29	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Hexachlorobutadiene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
2-Hexanone	<10		10	2.0	ug/L			04/09/19 19:29	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/09/19 19:29	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/09/19 19:29	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/09/19 19:29	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:29	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/09/19 19:29	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/09/19 19:29	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
Styrene	<1.0		1.0	0.27	ug/L			04/09/19 19:29	1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/09/19 19:29	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/09/19 19:29	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/09/19 19:29	1
Toluene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/09/19 19:29	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/09/19 19:29	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/09/19 19:29	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/09/19 19:29	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/09/19 19:29	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/09/19 19:29	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/09/19 19:29	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/09/19 19:29	1
Vinyl acetate	<2.0		2.0	0.81	ug/L			04/09/19 19:29	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/09/19 19:29	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/09/19 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/09/19 19:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/09/19 19:29*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/09/19 19:29*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/09/19 19:29*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	* UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
Acenaphthylene	<9.9	*	9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:46	1
Acetophenone	<9.9	*	9.9	0.56	ug/L		04/02/19 11:58	04/03/19 20:46	1
Anthracene	<9.9	*	9.9	0.68	ug/L		04/02/19 11:58	04/03/19 20:46	1
Atrazine	<9.9	*	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzaldehyde	<9.9		9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[a]anthracene	<9.9		9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[a]pyrene	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[b]fluoranthene	<9.9		9.9	2.6	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[g,h,i]perylene	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:46	1
Benzo[k]fluoranthene	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,1'-Biphenyl	<9.9	* UJ	9.9	0.57	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-chloroethoxy)methane	<9.9	*	9.9	0.93	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-chloroethyl)ether	<9.9	*	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
bis (2-chloroisopropyl) ether	<9.9	*	9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:46	1
Bis(2-ethylhexyl) phthalate	<9.9		9.9	1.6	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Bromophenyl phenyl ether	<9.9	* UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:46	1
Butyl benzyl phthalate	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
Caprolactam	<9.9	* UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
Carbazole	<9.9		9.9	0.70	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chloroaniline	<20	*	20	2.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chloro-3-methylphenol	<9.9	* UJ	9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.9	UJ	9.9	0.79	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Chlorophenol	<9.9		9.9	0.86	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Chlorophenyl phenyl ether	<9.9		9.9	0.83	ug/L		04/02/19 11:58	04/03/19 20:46	1
Chrysene	<9.9		9.9	0.51	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dibenz(a,h)anthracene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dibenzofuran	<9.9	UJ	9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,2-Dichlorobenzene	<9.9		9.9	0.53	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,3-Dichlorobenzene	<9.9		9.9	0.58	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,4-Dichlorobenzene	<9.9		9.9	0.54	ug/L		04/02/19 11:58	04/03/19 20:46	1
3,3'-Dichlorobenzidine	<59		59	30	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dichlorophenol	<9.9	UJ	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Diethyl phthalate	<9.9		9.9	0.87	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dimethylphenol	<9.9		9.9	4.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Dimethyl phthalate	<9.9		9.9	0.98	ug/L		04/02/19 11:58	04/03/19 20:46	1
Di-n-butyl phthalate	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:46	1
4,6-Dinitro-2-methylphenol	<50		50	9.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dinitrophenol	<50		50	9.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4-Dinitrotoluene	<9.9	UJ	9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,6-Dinitrotoluene	<9.9	UJ	9.9	1.1	ug/L		04/02/19 11:58	04/03/19 20:46	1
Di-n-octyl phthalate	<9.9		9.9	1.4	ug/L		04/02/19 11:58	04/03/19 20:46	1
Fluoranthene	<9.9		9.9	0.73	ug/L		04/02/19 11:58	04/03/19 20:46	1
Fluorene	<9.9	UJ	9.9	0.95	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorobenzene	<9.9		9.9	0.78	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorobutadiene	<9.9		9.9	0.61	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachlorocyclopentadiene	<9.9		9.9	2.5	ug/L		04/02/19 11:58	04/03/19 20:46	1
Hexachloroethane	<9.9	UJ	9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
Indeno[1,2,3-cd]pyrene	<9.9		9.9	0.99	ug/L		04/02/19 11:58	04/03/19 20:46	1
Isophorone	<9.9	UJ	9.9	0.89	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Methylnaphthalene	<9.9		9.9	0.77	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Methylphenol	<9.9		9.9	0.88	ug/L		04/02/19 11:58	04/03/19 20:46	1
3 & 4 Methylphenol	<9.9		9.9	1.3	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Nitroaniline	<50		50	1.3	ug/L		04/02/19 11:58	04/03/19 20:46	1
3-Nitroaniline	<50		50	5.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Nitroaniline	<50		50	5.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Nitrobenzene	<9.9		9.9	0.72	ug/L		04/02/19 11:58	04/03/19 20:46	1
2-Nitrophenol	<9.9		9.9	0.75	ug/L		04/02/19 11:58	04/03/19 20:46	1
4-Nitrophenol	<50		50	1.9	ug/L		04/02/19 11:58	04/03/19 20:46	1
N-Nitrosodi-n-propylamine	<9.9	UJ	9.9	0.71	ug/L		04/02/19 11:58	04/03/19 20:46	1
N-Nitrosodiphenylamine	<9.9	UJ	9.9	0.91	ug/L		04/02/19 11:58	04/03/19 20:46	1
Pentachlorophenol	<50		50	2.0	ug/L		04/02/19 11:58	04/03/19 20:46	1
Phenanthrene	<9.9	UJ	9.9	0.76	ug/L		04/02/19 11:58	04/03/19 20:46	1
Phenol	<9.9		9.9	0.82	ug/L		04/02/19 11:58	04/03/19 20:46	1
Pyrene	<9.9		9.9	0.62	ug/L		04/02/19 11:58	04/03/19 20:46	1
1,2,4-Trichlorobenzene	<9.9	UJ	9.9	0.55	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4,5-Trichlorophenol	<9.9		9.9	1.2	ug/L		04/02/19 11:58	04/03/19 20:46	1
2,4,6-Trichlorophenol	<9.9		9.9	0.84	ug/L		04/02/19 11:58	04/03/19 20:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*58*		*32 - 113*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
2-Fluorophenol	*47*		*26 - 109*	*04/02/19 11:58*	*04/03/19 20:46*	*1*

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	*56*		*32 - 118*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
Phenol-d5	*50*		*27 - 110*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
Terphenyl-d14	*43*		*10 - 126*	*04/02/19 11:58*	*04/03/19 20:46*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*04/02/19 11:58*	*04/03/19 20:46*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
Acenaphthylene	<9.8	H	9.8	0.83	ug/L		04/09/19 15:03	04/10/19 23:13	1
Acetophenone	<9.8	H	9.8	0.56	ug/L		04/09/19 15:03	04/10/19 23:13	1
Anthracene	<9.8	H	9.8	0.67	ug/L		04/09/19 15:03	04/10/19 23:13	1
Atrazine	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzaldehyde	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[a]anthracene	<9.8	H	9.8	0.54	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[a]pyrene	<9.8	H	9.8	0.69	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[b]fluoranthene	<9.8	H	9.8	2.5	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[g,h,i]perylene	<9.8	H	9.8	0.85	ug/L		04/09/19 15:03	04/10/19 23:13	1
Benzo[k]fluoranthene	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,1'-Biphenyl	<9.8	H	9.8	0.57	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-chloroethoxy)methane	<9.8	H	9.8	0.92	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-chloroethyl)ether	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
bis (2-chloroisopropyl) ether	<9.8	H	9.8	0.76	ug/L		04/09/19 15:03	04/10/19 23:13	1
Bis(2-ethylhexyl) phthalate	<9.8	H	9.8	1.6	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Bromophenyl phenyl ether	<9.8	H	9.8	0.75	ug/L		04/09/19 15:03	04/10/19 23:13	1
Butyl benzyl phthalate	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
Caprolactam	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
Carbazole	<9.8	H	9.8	0.69	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chloroaniline	<20	H UJ	20	2.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chloro-3-methylphenol	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Chloronaphthalene	<9.8	H	9.8	0.78	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Chlorophenol	<9.8	H	9.8	0.85	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Chlorophenyl phenyl ether	<9.8	H	9.8	0.82	ug/L		04/09/19 15:03	04/10/19 23:13	1
Chrysene	<9.8	H	9.8	0.50	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dibenz(a,h)anthracene	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dibenzofuran	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,2-Dichlorobenzene	<9.8	H	9.8	0.52	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,3-Dichlorobenzene	<9.8	H	9.8	0.58	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,4-Dichlorobenzene	<9.8	H	9.8	0.53	ug/L		04/09/19 15:03	04/10/19 23:13	1
3,3'-Dichlorobenzidine	<59	H	59	29	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dichlorophenol	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Diethyl phthalate	<9.8	H	9.8	0.86	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dimethylphenol	<9.8	H	9.8	3.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
Dimethyl phthalate	<9.8	H	9.8	0.97	ug/L		04/09/19 15:03	04/10/19 23:13	1
Di-n-butyl phthalate	<9.8	H	9.8	0.81	ug/L		04/09/19 15:03	04/10/19 23:13	1
4,6-Dinitro-2-methylphenol	<49	H	49	9.8	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dinitrophenol	<49	H	49	9.8	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4-Dinitrotoluene	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,6-Dinitrotoluene	<9.8	H	9.8	1.1	ug/L		04/09/19 15:03	04/10/19 23:13	1
Di-n-octyl phthalate	<9.8	H	9.8	1.4	ug/L		04/09/19 15:03	04/10/19 23:13	1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.8	H	9.8	0.72	ug/L		04/09/19 15:03	04/10/19 23:13	1
Fluorene	<9.8	H	9.8	0.94	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorobenzene	<9.8	H	9.8	0.77	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorobutadiene	<9.8	H	9.8	0.60	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachlorocyclopentadiene	<9.8	H UJ	9.8	2.4	ug/L		04/09/19 15:03	04/10/19 23:13	1
Hexachloroethane	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
Indeno[1,2,3-cd]pyrene	<9.8	H	9.8	0.98	ug/L		04/09/19 15:03	04/10/19 23:13	1
Isophorone	<9.8	H	9.8	0.88	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Methylnaphthalene	<9.8	H	9.8	0.76	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Methylphenol	<9.8	H	9.8	0.87	ug/L		04/09/19 15:03	04/10/19 23:13	1
3 & 4 Methylphenol	<9.8	H	9.8	1.3	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 23:13	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
Nitrobenzene	<9.8	H	9.8	0.71	ug/L		04/09/19 15:03	04/10/19 23:13	1
2-Nitrophenol	<9.8	H	9.8	0.74	ug/L		04/09/19 15:03	04/10/19 23:13	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 23:13	1
N-Nitrosodi-n-propylamine	<9.8	H	9.8	0.70	ug/L		04/09/19 15:03	04/10/19 23:13	1
N-Nitrosodiphenylamine	<9.8	H	9.8	0.90	ug/L		04/09/19 15:03	04/10/19 23:13	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 23:13	1
Phenanthrene	<9.8	H	9.8	0.75	ug/L		04/09/19 15:03	04/10/19 23:13	1
Phenol	<9.8	H UJ	9.8	0.81	ug/L		04/09/19 15:03	04/10/19 23:13	1
Pyrene	<9.8	H	9.8	0.61	ug/L		04/09/19 15:03	04/10/19 23:13	1
1,2,4-Trichlorobenzene	<9.8	H	9.8	0.55	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4,5-Trichlorophenol	<9.8	H	9.8	1.2	ug/L		04/09/19 15:03	04/10/19 23:13	1
2,4,6-Trichlorophenol	<9.8	H	9.8	0.83	ug/L		04/09/19 15:03	04/10/19 23:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*63*		*32 - 113*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
2-Fluorophenol	*51*		*26 - 109*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Nitrobenzene-d5	*64*		*32 - 118*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Phenol-d5	*50*		*27 - 110*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
Terphenyl-d14	*15*		*10 - 126*	*04/09/19 15:03*	*04/10/19 23:13*	*1*
2,4,6-Tribromophenol	*74*		*39 - 124*	*04/09/19 15:03*	*04/10/19 23:13*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.53**	**J**	1.0	0.31	ug/L			04/11/19 02:17	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**91**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:33	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:33	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:33	1
Barium	**42**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:33	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:33	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:33	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:33	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: SW1C (032719)
Date Collected: 03/27/19 08:20
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-9
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:33	1
Iron	**210**		50	17	ug/L		04/04/19 13:37	04/10/19 21:33	1
Lead	<10		10	3.9	ug/L		04/04/19 13:37	04/10/19 21:33	1
Magnesium	**8300**		500	33	ug/L		04/04/19 13:37	04/10/19 21:33	1
Manganese	**34**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Nickel	<40		40	2.1	ug/L		04/04/19 13:37	04/10/19 21:33	1
Potassium	**2200**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:33	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:33	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:33	1
Sodium	**16000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:33	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Vanadium	**1.0**	**J**	10	1.0	ug/L		04/04/19 13:37	04/10/19 21:33	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:33	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	.2 ~~0.082~~	~~J B~~ UB	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:25	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 02:27	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 02:27	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
Bromomethane	<5.0	UJ	5.0	2.5	ug/L			04/10/19 02:27	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 02:27	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 02:27	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 02:27	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
2-Chloroethyl vinyl ether	<10	R	10	5.0	ug/L			04/10/19 02:27	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 02:27	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 02:27	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 02:27	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 02:27	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 02:27	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 02:27	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 02:27	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 02:27	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 02:27	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 02:27	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 02:27	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 02:27	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 02:27	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 02:27	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 02:27	1
2,2-Dichloropropane	<1.0	UJ	1.0	0.37	ug/L			04/10/19 02:27	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 02:27	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Hexachlorobutadiene	<5.0	UJ	5.0	2.5	ug/L			04/10/19 02:27	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 02:27	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 02:27	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 02:27	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 02:27	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:27	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 02:27	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 02:27	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 02:27	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 02:27	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 02:27	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 02:27	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:27	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:27	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 02:27	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 02:27	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 02:27	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 02:27	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:27	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 02:27	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 02:27	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 02:27	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 02:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/10/19 02:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/10/19 02:27*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/10/19 02:27*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 02:27*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.7	* UJ	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
Acenaphthylene	<9.7	*	9.7	0.83	ug/L		04/02/19 11:58	04/03/19 21:11	1
Acetophenone	<9.7	*	9.7	0.55	ug/L		04/02/19 11:58	04/03/19 21:11	1
Anthracene	<9.7	*	9.7	0.67	ug/L		04/02/19 11:58	04/03/19 21:11	1
Atrazine	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzaldehyde	<9.7		9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[a]anthracene	<9.7		9.7	0.53	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[a]pyrene	<9.7		9.7	0.69	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[b]fluoranthene	<9.7		9.7	2.5	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[g,h,i]perylene	<9.7		9.7	0.84	ug/L		04/02/19 11:58	04/03/19 21:11	1
Benzo[k]fluoranthene	<9.7		9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,1'-Biphenyl	<9.7	*	9.7	0.56	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-chloroethoxy)methane	<9.7	*	9.7	0.91	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-chloroethyl)ether	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
bis (2-chloroisopropyl) ether	<9.7	*	9.7	0.76	ug/L		04/02/19 11:58	04/03/19 21:11	1
Bis(2-ethylhexyl) phthalate	<9.7		9.7	1.6	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Bromophenyl phenyl ether	<9.7	*	9.7	0.75	ug/L		04/02/19 11:58	04/03/19 21:11	1
Butyl benzyl phthalate	<9.7		9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
Caprolactam	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
Carbazole	<9.7		9.7	0.69	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chloroaniline	<19	*	19	2.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chloro-3-methylphenol	<9.7	* UJ	9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	<9.7	* UJ	9.7	0.78	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Chlorophenol	<9.7	*	9.7	0.84	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Chlorophenyl phenyl ether	<9.7	*	9.7	0.82	ug/L		04/02/19 11:58	04/03/19 21:11	1
Chrysene	<9.7		9.7	0.50	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dibenz(a,h)anthracene	<9.7		9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dibenzofuran	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,2-Dichlorobenzene	<9.7	*	9.7	0.51	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,3-Dichlorobenzene	<9.7	*	9.7	0.57	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,4-Dichlorobenzene	<9.7	*	9.7	0.52	ug/L		04/02/19 11:58	04/03/19 21:11	1
3,3'-Dichlorobenzidine	<58		58	29	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dichlorophenol	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Diethyl phthalate	<9.7	*	9.7	0.85	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dimethylphenol	<9.7	*	9.7	3.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Dimethyl phthalate	<9.7	*	9.7	0.96	ug/L		04/02/19 11:58	04/03/19 21:11	1
Di-n-butyl phthalate	<9.7		9.7	0.81	ug/L		04/02/19 11:58	04/03/19 21:11	1
4,6-Dinitro-2-methylphenol	<49		49	9.7	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dinitrophenol	<49		49	9.7	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4-Dinitrotoluene	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,6-Dinitrotoluene	<9.7	*	9.7	1.1	ug/L		04/02/19 11:58	04/03/19 21:11	1
Di-n-octyl phthalate	<9.7		9.7	1.4	ug/L		04/02/19 11:58	04/03/19 21:11	1
Fluoranthene	<9.7		9.7	0.72	ug/L		04/02/19 11:58	04/03/19 21:11	1
Fluorene	<9.7	*	9.7	0.93	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorobenzene	<9.7	*	9.7	0.77	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorobutadiene	<9.7	*	9.7	0.60	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachlorocyclopentadiene	<9.7	*	9.7	2.4	ug/L		04/02/19 11:58	04/03/19 21:11	1
Hexachloroethane	<9.7	* UJ	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
Indeno[1,2,3-cd]pyrene	<9.7		9.7	0.97	ug/L		04/02/19 11:58	04/03/19 21:11	1
Isophorone	<9.7	*	9.7	0.87	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Methylnaphthalene	<9.7	*	9.7	0.76	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Methylphenol	<9.7	*	9.7	0.86	ug/L		04/02/19 11:58	04/03/19 21:11	1
3 & 4 Methylphenol	<9.7	*	9.7	1.3	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Nitroaniline	<49	*	49	1.3	ug/L		04/02/19 11:58	04/03/19 21:11	1
3-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Nitroaniline	<49	*	49	4.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Nitrobenzene	<9.7	*	9.7	0.71	ug/L		04/02/19 11:58	04/03/19 21:11	1
2-Nitrophenol	<9.7	*	9.7	0.74	ug/L		04/02/19 11:58	04/03/19 21:11	1
4-Nitrophenol	<49		49	1.8	ug/L		04/02/19 11:58	04/03/19 21:11	1
N-Nitrosodi-n-propylamine	<9.7	*	9.7	0.70	ug/L		04/02/19 11:58	04/03/19 21:11	1
N-Nitrosodiphenylamine	<9.7	*	9.7	0.89	ug/L		04/02/19 11:58	04/03/19 21:11	1
Pentachlorophenol	<49		49	1.9	ug/L		04/02/19 11:58	04/03/19 21:11	1
Phenanthrene	<9.7	*	9.7	0.75	ug/L		04/02/19 11:58	04/03/19 21:11	1
Phenol	<9.7	*	9.7	0.81	ug/L		04/02/19 11:58	04/03/19 21:11	1
Pyrene	<9.7	UJ	9.7	0.61	ug/L		04/02/19 11:58	04/03/19 21:11	1
1,2,4-Trichlorobenzene	<9.7	*	9.7	0.54	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4,5-Trichlorophenol	<9.7	*	9.7	1.2	ug/L		04/02/19 11:58	04/03/19 21:11	1
2,4,6-Trichlorophenol	<9.7	*	9.7	0.83	ug/L		04/02/19 11:58	04/03/19 21:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*33*		*32 - 113*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
2-Fluorophenol	*23*	*X*	*26 - 109*	*04/02/19 11:58*	*04/03/19 21:11*	*1*

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*31*	*X*	*32 - 118*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
Phenol-d5	*18*	*X*	*27 - 110*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
Terphenyl-d14	*16*		*10 - 126*	*04/02/19 11:58*	*04/03/19 21:11*	*1*
2,4,6-Tribromophenol	*45*		*39 - 124*	*04/02/19 11:58*	*04/03/19 21:11*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
Acenaphthylene	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 23:38	1
Acetophenone	<9.9	H	9.9	0.56	ug/L		04/09/19 15:03	04/10/19 23:38	1
Anthracene	<9.9	H	9.9	0.68	ug/L		04/09/19 15:03	04/10/19 23:38	1
Atrazine	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzaldehyde	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[a]anthracene	<9.9	H	9.9	0.54	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[a]pyrene	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[b]fluoranthene	<9.9	H	9.9	2.6	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[g,h,i]perylene	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 23:38	1
Benzo[k]fluoranthene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,1'-Biphenyl	<9.9	H	9.9	0.57	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-chloroethoxy)methane	<9.9	H	9.9	0.93	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-chloroethyl)ether	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
bis (2-chloroisopropyl) ether	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 23:38	1
Bis(2-ethylhexyl) phthalate	<9.9	H	9.9	1.6	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Bromophenyl phenyl ether	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 23:38	1
Butyl benzyl phthalate	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
Caprolactam	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
Carbazole	<9.9	H	9.9	0.70	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chloroaniline	<20	H UJ	20	2.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chloro-3-methylphenol	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Chloronaphthalene	<9.9	H	9.9	0.79	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Chlorophenol	<9.9	H	9.9	0.86	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Chlorophenyl phenyl ether	<9.9	H	9.9	0.83	ug/L		04/09/19 15:03	04/10/19 23:38	1
Chrysene	<9.9	H	9.9	0.50	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dibenz(a,h)anthracene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dibenzofuran	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,2-Dichlorobenzene	<9.9	H	9.9	0.52	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,3-Dichlorobenzene	<9.9	H	9.9	0.58	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,4-Dichlorobenzene	<9.9	H	9.9	0.53	ug/L		04/09/19 15:03	04/10/19 23:38	1
3,3'-Dichlorobenzidine	<59	H	59	30	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dichlorophenol	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Diethyl phthalate	<9.9	H	9.9	0.87	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dimethylphenol	<9.9	H	9.9	3.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
Dimethyl phthalate	<9.9	H	9.9	0.98	ug/L		04/09/19 15:03	04/10/19 23:38	1
Di-n-butyl phthalate	<9.9	H	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 23:38	1
4,6-Dinitro-2-methylphenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dinitrophenol	<49	H	49	9.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4-Dinitrotoluene	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,6-Dinitrotoluene	<9.9	H	9.9	1.1	ug/L		04/09/19 15:03	04/10/19 23:38	1
Di-n-octyl phthalate	<9.9	H	9.9	1.4	ug/L		04/09/19 15:03	04/10/19 23:38	1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<9.9	H	9.9	0.73	ug/L		04/09/19 15:03	04/10/19 23:38	1
Fluorene	<9.9	H	9.9	0.95	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorobenzene	<9.9	H	9.9	0.78	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorobutadiene	<9.9	H	9.9	0.61	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachlorocyclopentadiene	<9.9	H UJ	9.9	2.5	ug/L		04/09/19 15:03	04/10/19 23:38	1
Hexachloroethane	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
Indeno[1,2,3-cd]pyrene	<9.9	H	9.9	0.99	ug/L		04/09/19 15:03	04/10/19 23:38	1
Isophorone	<9.9	H	9.9	0.89	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Methylnaphthalene	<9.9	H	9.9	0.77	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Methylphenol	<9.9	H	9.9	0.88	ug/L		04/09/19 15:03	04/10/19 23:38	1
3 & 4 Methylphenol	<9.9	H	9.9	1.3	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Nitroaniline	<49	H	49	1.3	ug/L		04/09/19 15:03	04/10/19 23:38	1
3-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Nitroaniline	<49	H	49	4.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
Nitrobenzene	<9.9	H	9.9	0.72	ug/L		04/09/19 15:03	04/10/19 23:38	1
2-Nitrophenol	<9.9	H	9.9	0.75	ug/L		04/09/19 15:03	04/10/19 23:38	1
4-Nitrophenol	<49	H	49	1.9	ug/L		04/09/19 15:03	04/10/19 23:38	1
N-Nitrosodi-n-propylamine	<9.9	H	9.9	0.71	ug/L		04/09/19 15:03	04/10/19 23:38	1
N-Nitrosodiphenylamine	<9.9	H	9.9	0.91	ug/L		04/09/19 15:03	04/10/19 23:38	1
Pentachlorophenol	<49	H	49	2.0	ug/L		04/09/19 15:03	04/10/19 23:38	1
Phenanthrene	<9.9	H	9.9	0.76	ug/L		04/09/19 15:03	04/10/19 23:38	1
Phenol	<9.9	H UJ	9.9	0.82	ug/L		04/09/19 15:03	04/10/19 23:38	1
Pyrene	<9.9	H	9.9	0.62	ug/L		04/09/19 15:03	04/10/19 23:38	1
1,2,4-Trichlorobenzene	<9.9	H	9.9	0.55	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4,5-Trichlorophenol	<9.9	H	9.9	1.2	ug/L		04/09/19 15:03	04/10/19 23:38	1
2,4,6-Trichlorophenol	<9.9	H	9.9	0.84	ug/L		04/09/19 15:03	04/10/19 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*60*		*32 - 113*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
2-Fluorophenol	*52*		*26 - 109*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Nitrobenzene-d5	*59*		*32 - 118*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Phenol-d5	*48*		*27 - 110*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
Terphenyl-d14	*11*		*10 - 126*	*04/09/19 15:03*	*04/10/19 23:38*	*1*
2,4,6-Tribromophenol	*72*		*39 - 124*	*04/09/19 15:03*	*04/10/19 23:38*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	**0.83**	**J**	1.0	0.31	ug/L			04/11/19 02:40	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**58**	**J**	200	24	ug/L		04/04/19 13:37	04/10/19 21:37	1
Antimony	<20		20	5.3	ug/L		04/04/19 13:37	04/10/19 21:37	1
Arsenic	<20		20	6.2	ug/L		04/04/19 13:37	04/10/19 21:37	1
Barium	**36**		10	1.7	ug/L		04/04/19 13:37	04/10/19 21:37	1
Beryllium	<4.0		4.0	0.10	ug/L		04/04/19 13:37	04/10/19 21:37	1
Cadmium	<5.0		5.0	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Calcium	**13000**		500	25	ug/L		04/04/19 13:37	04/10/19 21:37	1
Chromium	<10		10	1.6	ug/L		04/04/19 13:37	04/10/19 21:37	1
Cobalt	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1

Client Sample ID: DUP06 (032719)
Date Collected: 03/27/19 08:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-10
Matrix: Water

Method: 6010C - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	<20		20	1.8	ug/L		04/04/19 13:37	04/10/19 21:37	1
Iron	**160**		50	17	ug/L		04/04/19 13:37	04/10/19 21:37	1
Lead	**5.3**	**J**	10	3.9	ug/L		04/04/19 13:37	04/10/19 21:37	1
Magnesium	**8200**		500	33	ug/L		04/04/19 13:37	04/10/19 21:37	1
Manganese	**31**		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Nickel	**3.1**	**J**	40	2.1	ug/L		04/04/19 13:37	04/10/19 21:37	1
Potassium	**2100**		1000	17	ug/L		04/04/19 13:37	04/10/19 21:37	1
Selenium	<20		20	9.9	ug/L		04/04/19 13:37	04/10/19 21:37	1
Silver	<10		10	0.60	ug/L		04/04/19 13:37	04/10/19 21:37	1
Sodium	**15000**		1000	480	ug/L		04/04/19 13:37	04/10/19 21:37	1
Thallium	<25		25	6.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Vanadium	<10		10	1.0	ug/L		04/04/19 13:37	04/10/19 21:37	1
Zinc	<20		20	7.0	ug/L		04/04/19 13:37	04/10/19 21:37	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.2 ~~0.084~~	~~J B~~ UB	0.20	0.080	ug/L		04/11/19 10:21	04/11/19 19:29	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: EB-03 (032719)
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14		10	7.0	ug/L			04/10/19 02:04	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 02:04	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
Bromomethane	<5.0	* UJ	5.0	2.5	ug/L			04/10/19 02:04	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 02:04	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 02:04	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 02:04	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
2-Chloroethyl vinyl ether	<10	* R	10	5.0	ug/L			04/10/19 02:04	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 02:04	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 02:04	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 02:04	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 02:04	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 02:04	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 02:04	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 02:04	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 02:04	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 02:04	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 02:04	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 02:04	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 02:04	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 02:04	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 02:04	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 02:04	1
2,2-Dichloropropane	<1.0	* UJ	1.0	0.37	ug/L			04/10/19 02:04	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 02:04	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Hexachlorobutadiene	<5.0	* UJ	5.0	2.5	ug/L			04/10/19 02:04	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 02:04	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 02:04	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 02:04	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 02:04	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:04	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 02:04	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 02:04	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 02:04	1

Client Sample ID: EB-03 (032719)
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 02:04	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 02:04	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 02:04	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 02:04	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 02:04	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 02:04	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 02:04	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 02:04	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 02:04	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 02:04	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 02:04	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 02:04	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 02:04	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/10/19 02:04*	*1*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*		*04/10/19 02:04*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*04/10/19 02:04*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 02:04*	*1*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	<0.40	UJ	0.40	0.17	ug/L		04/03/19 09:50	04/04/19 00:04	1
Naphthalene	<0.20		0.20	0.12	ug/L		04/03/19 09:50	04/04/19 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*98*		*38 - 125*	*04/03/19 09:50*	*04/04/19 00:04*	*1*
Terphenyl-d14	*89*		*70 - 130*	*04/03/19 09:50*	*04/04/19 00:04*	*1*

Method: 314.0 - Perchlorate (IC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	<1.0		1.0	0.31	ug/L			04/11/19 04:35	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: Trip Blank
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10		10	7.0	ug/L			04/10/19 01:18	1
Benzene	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
Bromobenzene	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Bromochloromethane	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
Bromodichloromethane	<1.0		1.0	0.44	ug/L			04/10/19 01:18	1
Bromoform	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
Bromomethane	<5.0	* UJ	5.0	2.5	ug/L			04/10/19 01:18	1
2-Butanone	<10		10	3.4	ug/L			04/10/19 01:18	1
Carbon disulfide	<2.0		2.0	1.0	ug/L			04/10/19 01:18	1
Carbon tetrachloride	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Chlorobenzene	<1.0		1.0	0.26	ug/L			04/10/19 01:18	1
Chloroethane	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
2-Chloroethyl vinyl ether	<10	* R	10	5.0	ug/L			04/10/19 01:18	1
Chloroform	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Chloromethane	<1.0		1.0	0.40	ug/L			04/10/19 01:18	1
2-Chlorotoluene	<1.0		1.0	0.27	ug/L			04/10/19 01:18	1
4-Chlorotoluene	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
cis-1,2-Dichloroethene	<1.0		1.0	0.41	ug/L			04/10/19 01:18	1
cis-1,3-Dichloropropene	<1.0		1.0	0.40	ug/L			04/10/19 01:18	1
Dibromochloromethane	<1.0		1.0	0.32	ug/L			04/10/19 01:18	1
1,2-Dibromo-3-Chloropropane	<5.0		5.0	1.1	ug/L			04/10/19 01:18	1
1,2-Dibromoethane	<1.0		1.0	0.44	ug/L			04/10/19 01:18	1
Dibromomethane	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
1,2-Dichlorobenzene	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,3-Dichlorobenzene	<1.0		1.0	0.43	ug/L			04/10/19 01:18	1
1,4-Dichlorobenzene	<1.0		1.0	0.46	ug/L			04/10/19 01:18	1
Dichlorodifluoromethane	<1.0		1.0	0.60	ug/L			04/10/19 01:18	1
1,1-Dichloroethane	<1.0		1.0	0.38	ug/L			04/10/19 01:18	1
1,2-Dichloroethane	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
1,1-Dichloroethene	<1.0		1.0	0.36	ug/L			04/10/19 01:18	1
1,2-Dichloroethene, Total	<2.0		2.0	0.37	ug/L			04/10/19 01:18	1
1,2-Dichloropropane	<1.0		1.0	0.67	ug/L			04/10/19 01:18	1
1,3-Dichloropropane	<1.0		1.0	0.34	ug/L			04/10/19 01:18	1
2,2-Dichloropropane	<1.0	* UJ	1.0	0.37	ug/L			04/10/19 01:18	1
1,1-Dichloropropene	<1.0		1.0	0.34	ug/L			04/10/19 01:18	1
Ethylbenzene	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Hexachlorobutadiene	<5.0	* UJ	5.0	2.5	ug/L			04/10/19 01:18	1
2-Hexanone	<10		10	2.0	ug/L			04/10/19 01:18	1
Isopropylbenzene	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
Methylene Chloride	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
4-Methyl-2-pentanone	<10		10	2.1	ug/L			04/10/19 01:18	1
Methyl tert-butyl ether	<10		10	0.30	ug/L			04/10/19 01:18	1
m-Xylene & p-Xylene	<1.0		1.0	0.35	ug/L			04/10/19 01:18	1
n-Butylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 01:18	1
N-Propylbenzene	<1.0		1.0	0.38	ug/L			04/10/19 01:18	1
o-Xylene	<1.0		1.0	0.23	ug/L			04/10/19 01:18	1
p-Isopropyltoluene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
sec-Butylbenzene	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
Styrene	<1.0		1.0	0.27	ug/L			04/10/19 01:18	1

Client: ARCADIS U.S., Inc.
Project/Site: ATK Orbital Elkton

Job ID: 680-166627-1

Client Sample ID: Trip Blank
Date Collected: 03/27/19 00:00
Date Received: 03/29/19 09:01

Lab Sample ID: 680-166627-12
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butylbenzene	<1.0		1.0	0.45	ug/L			04/10/19 01:18	1
1,1,1,2-Tetrachloroethane	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,1,2,2-Tetrachloroethane	<1.0		1.0	0.62	ug/L			04/10/19 01:18	1
Tetrachloroethene	<1.0		1.0	0.74	ug/L			04/10/19 01:18	1
Toluene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
trans-1,2-Dichloroethene	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
trans-1,3-Dichloropropene	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
1,2,3-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
1,2,4-Trichlorobenzene	<5.0		5.0	2.5	ug/L			04/10/19 01:18	1
1,1,1-Trichloroethane	<1.0		1.0	0.37	ug/L			04/10/19 01:18	1
1,1,2-Trichloroethane	<1.0		1.0	0.33	ug/L			04/10/19 01:18	1
Trichloroethene	<1.0		1.0	0.48	ug/L			04/10/19 01:18	1
Trichlorofluoromethane	<1.0		1.0	0.42	ug/L			04/10/19 01:18	1
1,2,3-Trichloropropane	<1.0		1.0	0.39	ug/L			04/10/19 01:18	1
1,2,4-Trimethylbenzene	<1.0		1.0	0.47	ug/L			04/10/19 01:18	1
1,3,5-Trimethylbenzene	<1.0		1.0	0.31	ug/L			04/10/19 01:18	1
Vinyl acetate	<2.0	*	2.0	0.81	ug/L			04/10/19 01:18	1
Vinyl chloride	<1.0		1.0	0.50	ug/L			04/10/19 01:18	1
Xylenes, Total	<1.0		1.0	0.23	ug/L			04/10/19 01:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/10/19 01:18*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*73 - 131*		*04/10/19 01:18*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 122*		*04/10/19 01:18*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/10/19 01:18*	*1*

APPENDIX E

Elkton ATK Site: Pesticide Areas Update

Memo

To:	Richard Zambito Alliant Techsystems Operations, LLC
From:	Kelly R. McIntosh, Ph.D., P.E. GEI Consultants, Inc.
cc:	George W. Crouse (Syngenta Crop Protection) Carrie A. Hunt, CHMM (Olin Corporation) Keith Roberts (Olin Corporation)
Date:	August 28, 2019
Re:	Elkton ATK Site: Pesticide Areas Update

As of August 26, 2019, construction activities for all Pesticide Areas to be remediated have been completed in accordance with the Statement of Basis (USEPA, March 22, 2017), the Permit for Corrective Action (USEPA, May 26, 2017), the Soil Consolidation and Capping Plan for Pesticide and Sewer Line Areas (GEI, July 25, 2017), and the Final Design (GEI, October 31, 2017).

Pesticide SWMU Area of Concern (AOC)

All excavation and consolidation activities have been completed. The cap over the consolidation areas was completed August 9, 2019. Site restoration including seeding and mulching have been completed on all disturbed areas. The laydown area was restored and necessary security fence repairs were completed by August 19, 2019 and the contractor (Entact) has demobilized. GEI will conduct follow-up site inspections in September and October 2019 to document vegetation growth and identify any continuing erosion potential. The silt fence will remain in place through November 2019 and the support fence may remain for a period of time after that. After vegetation has been adequately established (minimum 70% permanent vegetation cover), the Notice of Termination will be submitted in accordance with General NPDES Permit Number MDRC and State Discharge Permit Number 14GP (Stormwater Associated with Construction Activity).

In accordance with the Performance Monitoring Plan (Arcadis, July 28, 2017), the first annual groundwater monitoring event for the Pesticide SWMU AOC is scheduled to be completed prior to August 19, 2020.

Sewer Line Area

As indicated in the Project Status Update for July 2019 transmitted via email from Mr. Zambito, the fire and subsequent removal of Building G-11 necessitated a change in the pavement sealing in the Sewer Line Area. It was decided that, in lieu of delaying the project until the Building was reconstructed, soil would be removed from the footprint of the future building foundation and associated future underground piping runs. Approximately 400 cubic yards of soil were excavated and placed in the consolidation area. Construction debris were segregated and managed separately by Alliant. Excavated soil was replaced with clean backfill. This will negate the need for sealing around the new building when it is constructed. Outside the Building G-11 area, paving and sealing was completed as planned.

As-built drawings and a detailed description of the work performed in the Pesticide SWMU AOC and Sewer Line Area will be included in the CMI Report for the Pesticide Areas, which is scheduled to be completed and submitted before the end of 2019.

APPENDIX F

Well Abandonment Logs

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 09/25/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

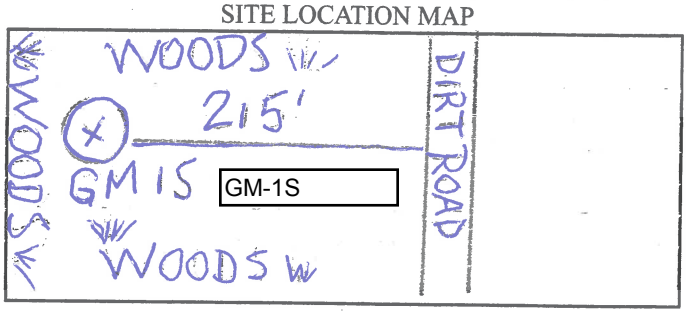
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.611594
LONGITUDE 75.859834

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	20

VOLUME OF MATERIAL USED: 4 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 20 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/23/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE 93 0323

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

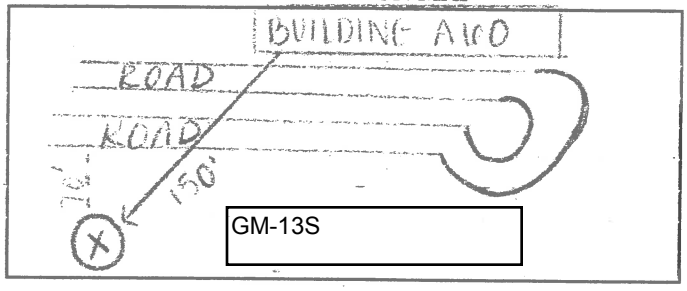
* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.612751
LONGITUDE 75.662471

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	20

VOLUME OF MATERIAL USED: 2 1/2 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 20 FEET DEEP

WAS ANY CASING REMOVED? X YES _____ NO
If yes, length removed, in feet: 20

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19
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OWNER

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DATE WELL ABANDONED: 07/25/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

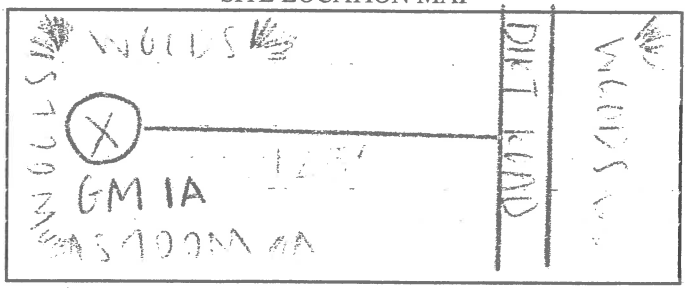
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD

LATITUDE 39.611724

LONGITUDE 75.859706

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	94
VOLUME OF MATERIAL USED		
5 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 94 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

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OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

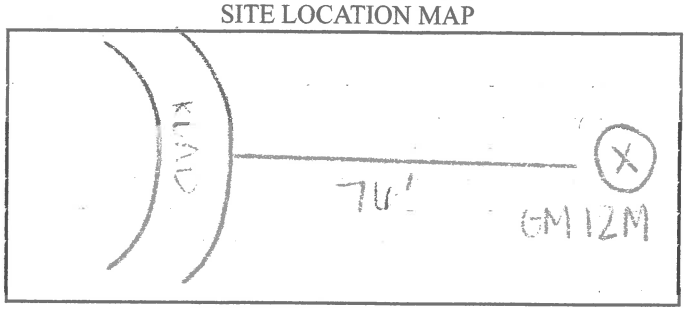
DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0232
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP_____BLOCK_____PARCEL_____
SUBDIVISION:_____
SECTION:_____LOT:_____
STREET ADDRESS: 55 THIOKOL RD

LATITUDE 39.619130

LONGITUDE 75.827465

SITE LOCATION MAP



* TYPE OF WELL BEING ABANDONED:
X DRILLED _____JETTED
_____BORED _____HAND DUG
_____OTHER (specify)_____

* USE CODE:
_____DOMESTIC _____MUNICIPAL/PUBLIC
_____IRRIGATION _____INDUSTRIAL
X TEST/OBSERVATION _____GEOTHERMAL

* TYPE OF CASING:
_____STEEL X PLASTIC
_____CONCRETE _____OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 30 FEET DEEP

WAS ANY CASING REMOVED? X YES _____NO
If yes, length removed, in feet: 30'

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
NEAT FILL	0	30
VOLUME OF MATERIAL USED		
3 BAGS		

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Zach Miller 597 (MWD) MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

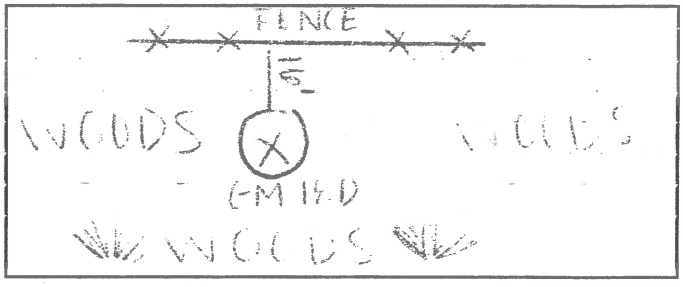
DATE WELL ABANDONED: 07/26/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —
* PERMIT NUMBER OF REPLACEMENT WELL: — NA —
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP____ BLOCK____ PARCEL____
SUBDIVISION:
SECTION: LOT:
STREET ADDRESS: 55 THIOKOL RD

LATITUDE 39.6242959

LONGITUDE 75.8614885

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	38
VOLUME OF MATERIAL USED		
6 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify)____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 38 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

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1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

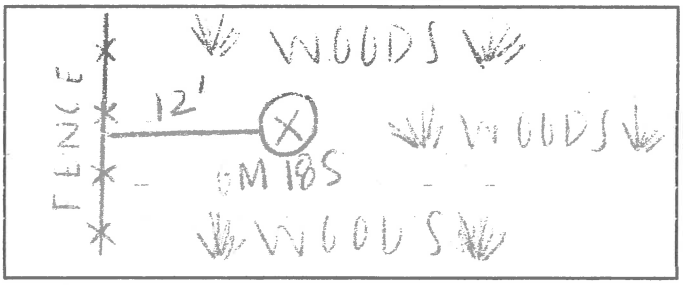
DATE WELL ABANDONED: 07/26/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —
* PERMIT NUMBER OF REPLACEMENT WELL: — NA —
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 3 9.6243245

LONGITUDE 7 5.8614587

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	20
VOLUME OF MATERIAL USED		
3 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) _____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) _____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 20 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/26/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

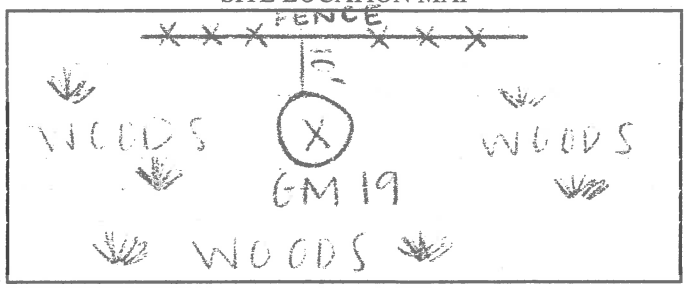
* PERSON ABANDONING WELL: LUNNY HUKD WELL DRILLER'S LICENSE NUMBER: TSD 123
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP FRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 555 THICKET RD.

LATITUDE 39.624376
LONGITUDE 75.960738

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	16

VOLUME OF MATERIAL USED: 2 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 16 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

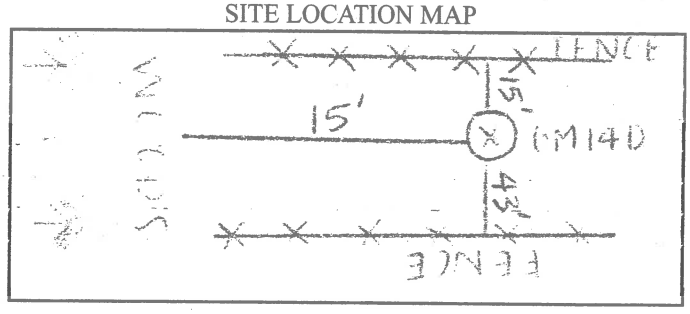
DATE WELL ABANDONED: 07/25/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 93 – 0327
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.6085817

LONGITUDE 75.8582431

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
QUICK GROUT	0	147
VOLUME OF MATERIAL USED		
6 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 147 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

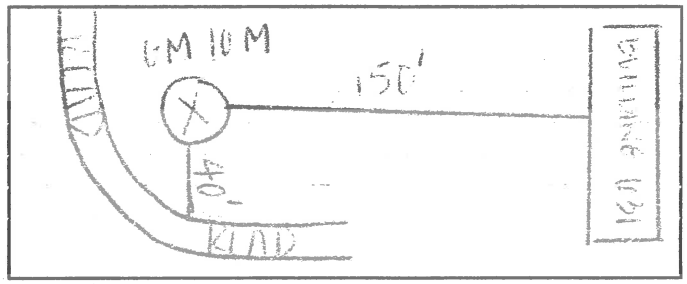
DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0226
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 3 9 . 6 1 6 2 2 3 5

LONGITUDE 7 5 . 8 6 4 2 5 3 6

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	20
VOLUME OF MATERIAL USED		
3 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 20 FEET DEEP

WAS ANY CASING REMOVED? X YES ____ NO
If yes, length removed, in feet: 20

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 95 – 0326

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

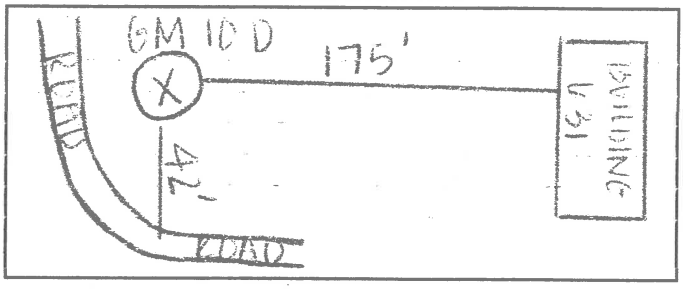
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.611302
LONGITUDE 75.842902

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	82

VOLUME OF MATERIAL USED
7 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 82 FEET DEEP

WAS ANY CASING REMOVED? X YES _____ NO
If yes, length removed, in feet: 10

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

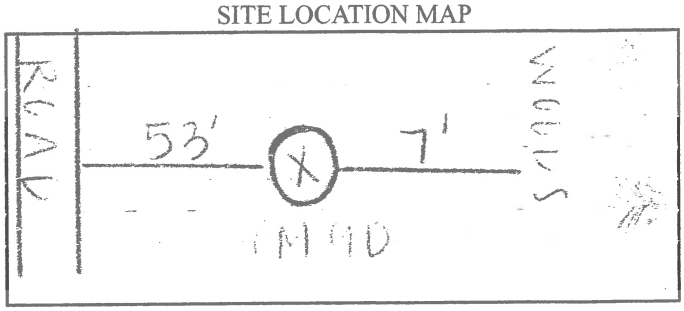
* PERSON ABANDONING WELL: LUNNY HURD WELL DRILLER'S LICENSE NUMBER: TSD133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.616230 2
LONGITUDE 75.864298 2

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
WATER GROUT	0	80

VOLUME OF MATERIAL USED
9 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 80 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

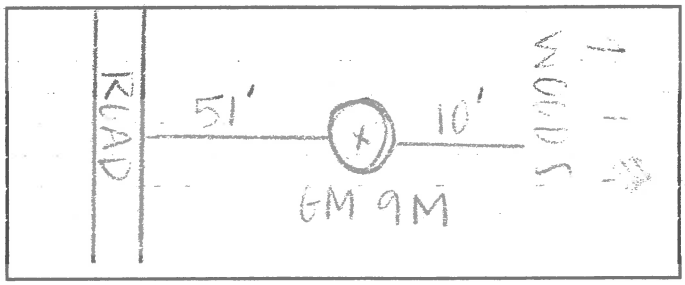
DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —
* PERMIT NUMBER OF REPLACEMENT WELL: — NA —
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 3 9.6 1 6 2 2 3 5

LONGITUDE 7 5.8 6 4 2 5 3 6

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	45
VOLUME OF MATERIAL USED		
4 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 45 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0233

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

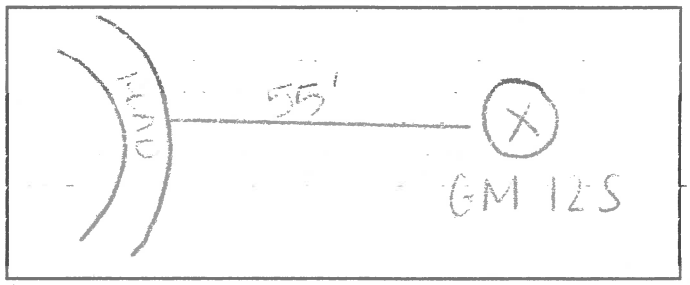
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: TSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 MICROL RD.

LATITUDE 39.619011
LONGITUDE 75.827941

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	15

VOLUME OF MATERIAL USED: 2 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 15 FEET DEEP

WAS ANY CASING REMOVED? X YES _____ NO
If yes, length removed, in feet: 15

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:

* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

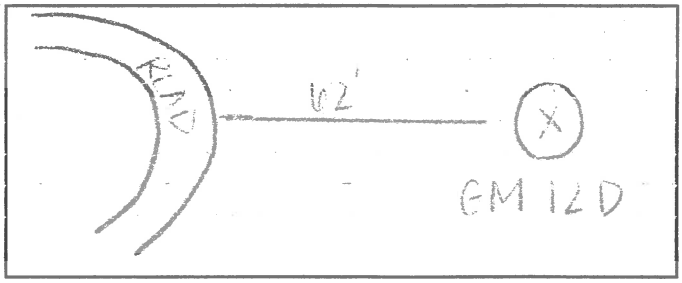
DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 93 – 0329
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.6190882

LONGITUDE 75.8627633

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
QUICK GROUT	0	55
VOLUME OF MATERIAL USED		
3 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 55 FEET DEEP

WAS ANY CASING REMOVED? X YES ____ NO
If yes, length removed, in feet: 55

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0249

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSV 133
CIRCLE: MWD / MSD / MGD

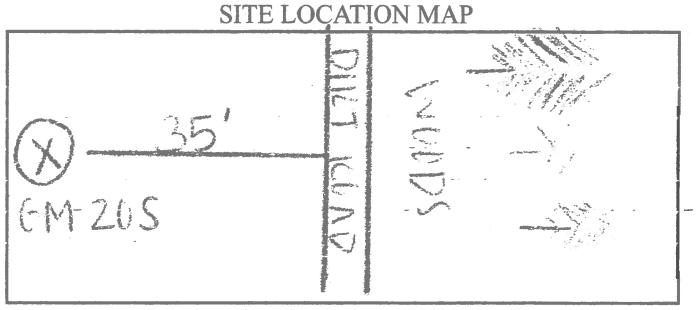
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.624850

LONGITUDE 75.861521

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	21

VOLUME OF MATERIAL USED
3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 21 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

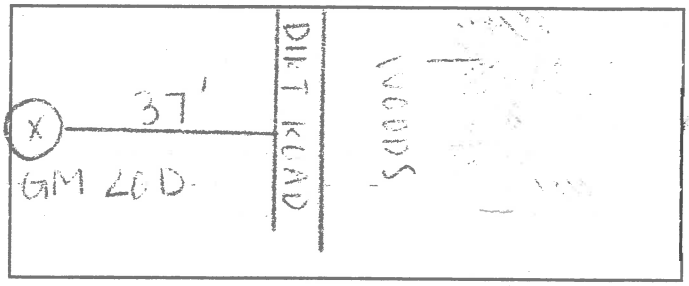
DATE WELL ABANDONED: 07/24/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0248
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
* OWNER'S NAME: NORTHROP GRUMMAN CIRCLE: MWD / MSD / MGD
* WELL LOCATION:
  COUNTY: CECIL
  NEAREST TOWN: ELKTON, MD
  TAX MAP ____ BLOCK ____ PARCEL ____
  SUBDIVISION: ____
  SECTION: ____ LOT: ____
  STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 3 9.6248397

LONGITUDE 7 5.8615559

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
QUICK GROUT	0	64

VOLUME OF MATERIAL USED: 5 BAGS

* TYPE OF WELL BEING ABANDONED:
  X DRILLED ____ JETTED
  ____ BORED ____ HAND DUG
  ____ OTHER (specify) ____

* USE CODE:
  ____ DOMESTIC ____ MUNICIPAL/PUBLIC
  ____ IRRIGATION ____ INDUSTRIAL
  X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
  ____ STEEL X PLASTIC
  ____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 64 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 5570

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

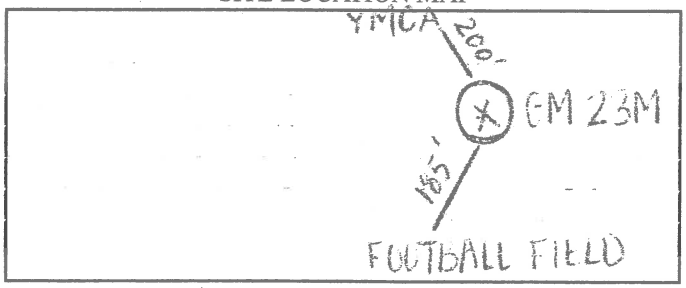
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: TSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.609195
LONGITUDE 75.848528

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	34

VOLUME OF MATERIAL USED: 2 1/2 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 34 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 5571

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

* PERSON ABANDONING WELL: LONNY HIVER WELL DRILLER'S LICENSE NUMBER: JSD 193
CIRCLE: MWD / MSD / MGD

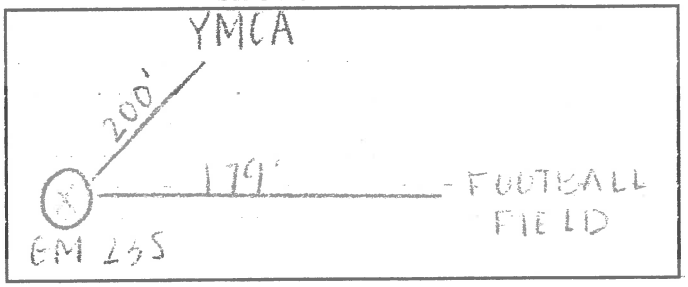
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.609354

LONGITUDE 75.842305

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	20

VOLUME OF MATERIAL USED
3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 20 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

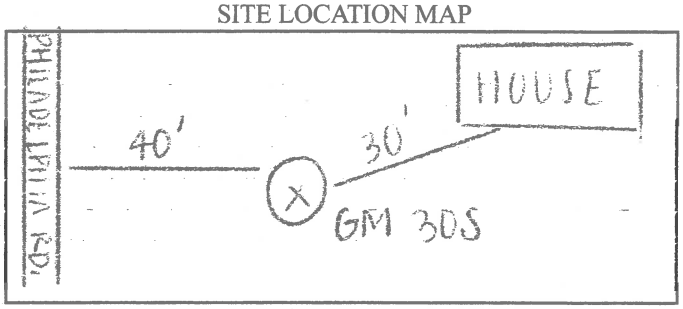
DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 95 – 0079
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 3 9.6059439

LONGITUDE 7 5.8557298

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	18
VOLUME OF MATERIAL USED		
3 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 18 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

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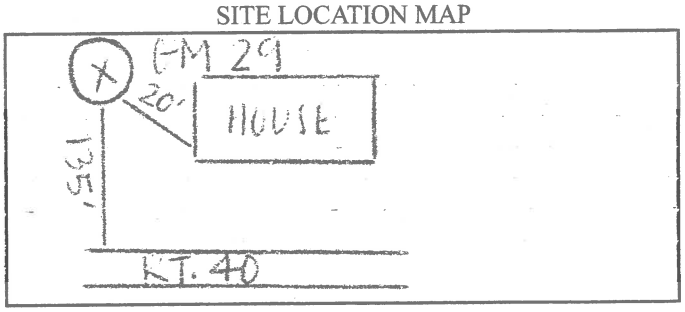
SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —
* PERMIT NUMBER OF REPLACEMENT WELL: — NA —
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP ____ BLOCK ____ PARCEL ____
SUBDIVISION: ____
SECTION: ____ LOT: ____
STREET ADDRESS: 55 THICKOL RD.

LATITUDE 3 9.4674095
LONGITUDE 7 5.8558059

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
HOLE PLUG	0	42
VOLUME OF MATERIAL USED		
4 BAGS		

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) ____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify) ____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 42 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: ____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 MWD / MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

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SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/17/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

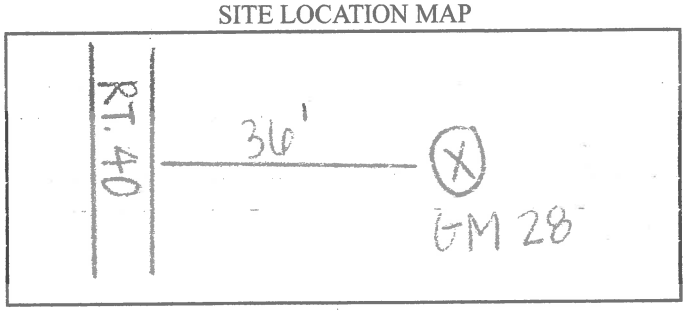
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.607499

LONGITUDE 75.858641

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	18

VOLUME OF MATERIAL USED: 3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 18 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

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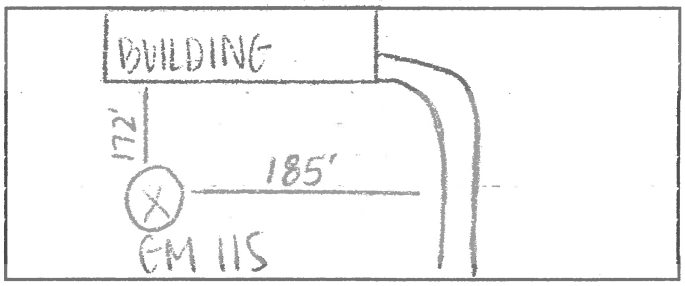
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/18/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0230
* PERMIT NUMBER OF REPLACEMENT WELL: – NA –
* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD
* OWNER'S NAME: NORTHROP GRUMMAN
* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP_____BLOCK_____PARCEL_____
SUBDIVISION:_____
SECTION:_____LOT:_____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.616714
LONGITUDE 75.864776

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	15

VOLUME OF MATERIAL USED: 3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____JETTED
_____BORED _____HAND DUG
_____OTHER (specify)_____

* USE CODE:
_____DOMESTIC _____MUNICIPAL/PUBLIC
_____IRRIGATION _____INDUSTRIAL
X TEST/OBSERVATION _____GEOTHERMAL

* TYPE OF CASING:
_____STEEL X PLASTIC
_____CONCRETE _____OTHER (specify)

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 15 FEET DEEP

WAS ANY CASING REMOVED? X YES_____NO
If yes, length removed, in feet: 15

WAS CASING RIPPED OR PERFORATED?____YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

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OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/18/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 93 – 0324

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

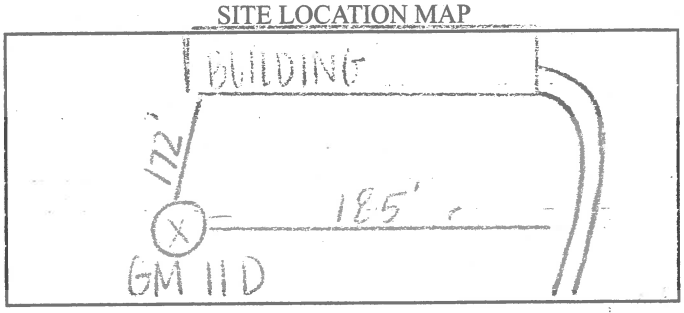
* OWNER'S NAME: NORTHKOP FRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.616136 7

LONGITUDE 75.864792 7

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	109

VOLUME OF MATERIAL USED

12 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 109 FEET DEEP

WAS ANY CASING REMOVED? X YES _____ NO
If yes, length removed, in feet: 109

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

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Earl Allen 597 (MWD) MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/18/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0231

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

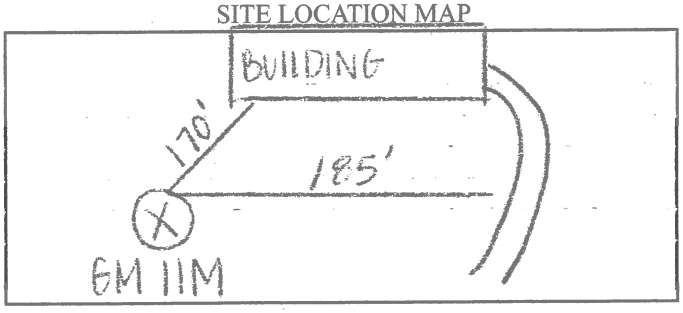
* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP_____BLOCK_____PARCEL_____
SUBDIVISION:_____
SECTION:_____LOT:_____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.616794
LONGITUDE 75.948310

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	50

VOLUME OF MATERIAL USED: 2 1/2 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____JETTED
_____BORED _____HAND DUG
_____OTHER (specify)_____

* USE CODE:
_____DOMESTIC _____MUNICIPAL/PUBLIC
_____IRRIGATION _____INDUSTRIAL
X TEST/OBSERVATION _____GEOTHERMAL

* TYPE OF CASING:
_____STEEL X PLASTIC
_____CONCRETE _____OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 50 FEET DEEP

WAS ANY CASING REMOVED? X YES _____NO
If yes, length removed, in feet: 50

WAS CASING RIPPED OR PERFORATED? _____ YES X NO

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[signature] 597 (MWD) MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

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WATER WELL ABANDONMENT-SEALING REPORT FORM

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* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/23/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0234

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

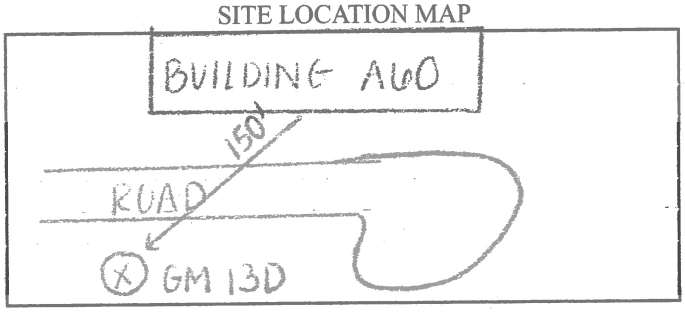
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.612785 0

LONGITUDE 75.862430

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET FROM	FEET TO
QUICK GROUT	0	106'

VOLUME OF MATERIAL USED: 5 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) _____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 106 FEET DEEP

WAS ANY CASING REMOVED? X YES ____ NO
If yes, length removed, in feet: 106

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

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[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

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* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/23/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) CE – 94 – 0235

* PERMIT NUMBER OF REPLACEMENT WELL: – NA –

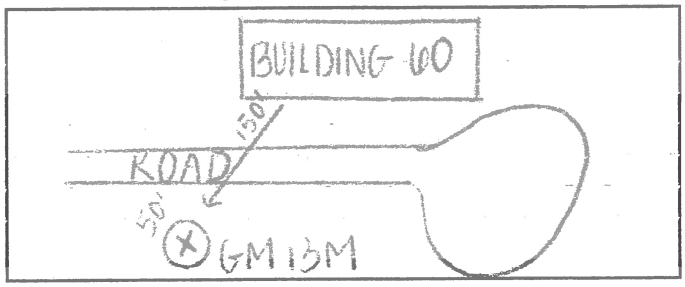
* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP_____BLOCK_____PARCEL_____
SUBDIVISION:_____
SECTION:_____LOT:_____
STREET ADDRESS: 55 THIOKOL DR.

LATITUDE 39.612811
LONGITUDE 75.862428

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	58'

VOLUME OF MATERIAL USED: 3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____JETTED
_____BORED _____HAND DUG
_____OTHER (specify)_____

* USE CODE:
_____DOMESTIC _____MUNICIPAL/PUBLIC
_____IRRIGATION _____INDUSTRIAL
X TEST/OBSERVATION _____GEOTHERMAL

* TYPE OF CASING:
_____STEEL X PLASTIC
_____CONCRETE _____OTHER (specify)

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 58' FEET DEEP

WAS ANY CASING REMOVED? X YES_____NO
If yes, length removed, in feet: 58'

WAS CASING RIPPED OR PERFORATED?____YES X NO

Pursuant to § 10-624 of the State Govt. Article of the Maryland Code, personal info requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State Law.

[signature] 597 (MWD) / MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/23/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

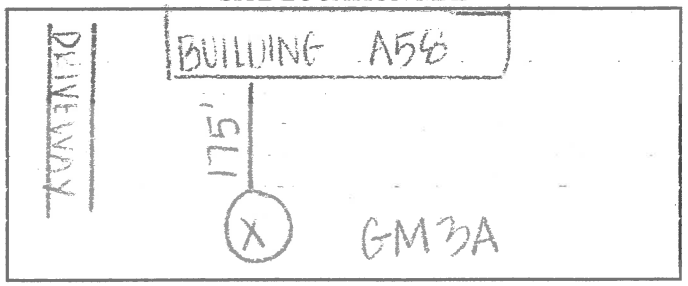
* PERSON ABANDONING WELL: LONNY HURD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL DR.

LATITUDE 39.609199
LONGITUDE 75.862805

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	139

VOLUME OF MATERIAL USED
9 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 139 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

Pursuant to § 10-624 of the State Govt. Article of the Maryland Code, personal info requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State Law.

[signature] 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/23/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

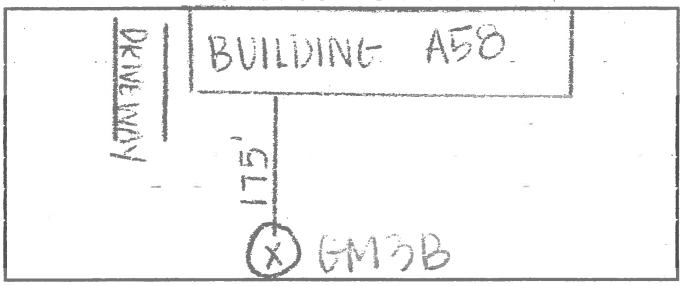
* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 THIOKOL RD.

LATITUDE 39.609130
LONGITUDE 75.862741

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
QUICK GROUT	0	52

VOLUME OF MATERIAL USED: 5 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED ____ JETTED
____ BORED ____ HAND DUG
____ OTHER (specify) _____

* USE CODE:
____ DOMESTIC ____ MUNICIPAL/PUBLIC
____ IRRIGATION ____ INDUSTRIAL
X TEST/OBSERVATION ____ GEOTHERMAL

* TYPE OF CASING:
____ STEEL X PLASTIC
____ CONCRETE ____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 52' FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

Pursuant to § 10-624 of the State Govt. Article of the Maryland Code, personal info requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State Law.

[signature] 597 (MWD) MSD / MGS 7-26-19
SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

****

WATER WELL ABANDONMENT-SEALING REPORT FORM

****

SUBMIT COPIES OF COMPLETED FORM TO:
* COUNTY ENVIRONMENTAL AGENCY (contact MDE, WMA if address needed)
* WELL OWNER
* MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 07/26/19 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any) — NA —

* PERMIT NUMBER OF REPLACEMENT WELL: — NA —

* PERSON ABANDONING WELL: LONNY HUKD WELL DRILLER'S LICENSE NUMBER: JSD 133
CIRCLE: MWD / MSD / MGD

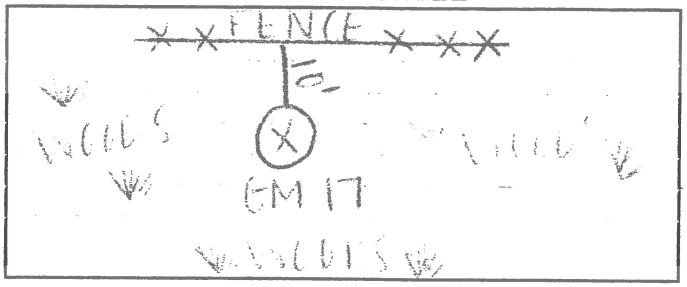
* OWNER'S NAME: NORTHROP GRUMMAN

* WELL LOCATION:
COUNTY: CECIL
NEAREST TOWN: ELKTON, MD
TAX MAP _____ BLOCK _____ PARCEL _____
SUBDIVISION: _____
SECTION: _____ LOT: _____
STREET ADDRESS: 55 TURKEY RD

LATITUDE 39.624238 0

LONGITUDE 75.817219

SITE LOCATION MAP



LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
HOLE PLUG	0	19

VOLUME OF MATERIAL USED

3 BAGS

* TYPE OF WELL BEING ABANDONED:
X DRILLED _____ JETTED
_____ BORED _____ HAND DUG
_____ OTHER (specify) _____

* USE CODE:
_____ DOMESTIC _____ MUNICIPAL/PUBLIC
_____ IRRIGATION _____ INDUSTRIAL
X TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:
_____ STEEL X PLASTIC
_____ CONCRETE _____ OTHER (specify)
_____

SIZE OF CASING: 4" INCHES IN DIAMETER

DEPTH OF WELL: 19 FEET DEEP

WAS ANY CASING REMOVED? ____ YES X NO
If yes, length removed, in feet: _____

WAS CASING RIPPED OR PERFORATED? ____ YES X NO

Pursuant to § 10-624 of the State Govt. Article of the Maryland Code, personal info requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State Law.

Bob Allen 597 (MWD) / MSD / MGS 7-26-19

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN LICENSE# CIRCLE ONE DATE

OWNER

APPENDIX G

Photolog for Beryllium SWMU IEC Verification

Appendix G – Photo Log

Beryllium SWMU IEC Verification
CMI – 2019 Annual Progress Report
Elkton, MD

Photo: 1

Date: August 8, 2019

Description: Intact Beryllium SWMU fencing, southeast corner of restricted area

Location:

Alliant Techsystems Operations, LLC

Elkton, MD

Appendix G – Photo Log

Beryllium SWMU IEC Verification
CMI – 2019 Annual Progress Report
Elkton, MD

Photo: 2

Date: August 8, 2019

Description: : Intact Beryllium SWMU signage, eastern boundary of restricted area

Location:

Alliant Techsystems Operations, LLC

Elkton, MD

Appendix G – Photo Log

Beryllium SWMU IEC Verification
CMI – 2019 Annual Progress Report
Elkton, MD

Photo: 3

Date: August 8, 2019

Description: Close-up of intact signage

Location:
Alliant Techsystems Operations, LLC
Elkton, MD

Appendix G – Photo Log

Beryllium SWMU IEC Verification
CMI – 2019 Annual Progress Report
Elkton, MD

Photo: 4

Date: August 8, 2019

Description: Intact Beryllium SWMU fencing, eastern boundary of restricted area

Location:
Alliant Techsystems Operations, LLC
Elkton, MD

Appendix G – Photo Log

Beryllium SWMU IEC Verification
CMI – 2019 Annual Progress Report
Elkton, MD

Photo: 5

Date: August 8, 2019

Description: Intact Beryllium SWMU fencing, northeast corner of restricted area

Location:
Alliant Techsystems Operations, LLC
Elkton, MD

APPENDIX H

Groundwater Use Restriction Correspondence

NORTHROP GRUMMAN

Northrop Grumman Corporation
Innovation Systems

Missile Products Division
Propulsion Systems and Controls (PS&C)
55 Thiokol Road
Elkton, Maryland 21921

Ref: RLZ-19-038

July 2, 2019

Cecil County Health Department
401 Bow Street
Elkton, Maryland 21921

Subject: Off-Site Groundwater Use
Alliant Techsystems Operations LLC
USEPA ID #MDD 003 067 121

Dear Sir or Madam:

As you are aware an environmental investigation, performed under the direction of the United States Environmental Protection Agency (USEPA), has been completed for the Alliant Techsystems Operations LLC (Alliant) facility located at 55 Thiokol Road in Elkton, Maryland (the Site). As a result of this investigation, groundwater remediation is being conducted at the site. Alliant is implementing a Performance Monitoring Plan (PMP) and an Institutional and Engineering Controls Plan (IECP) as approved by USEPA to ensure that groundwater remediation is protective of human health and the environment.

As part of the IECP, no groundwater wells should be installed in the vicinity of the Site (refer to enclosed figure); groundwater in this vicinity may be impacted and should not be used for drinking, bathing, irrigation, etc. It is Alliant's understanding that no formal groundwater use exclusion areas are maintained in Cecil County; however, we are submitting this letter as a formal notification that groundwater use should not be permitted in the area shown on the figure.

Should you have any questions regarding the remedial activities being performed at the site, or the groundwater quality in this area, please contact me at (410) 392-1626.

Very truly yours,

Richard L. Zambito, P.E.
Sr. Principal EHS Engineer

Enclosure

Cc: Mr. Erich Weissbart, P.G., United States Environmental Protection Agency
Office of Remediation (3LC20), EPA Region III
Mr. Ed Hammerberg, Maryland Department of the Environment
Mr. George Crouse, Syngenta Crop Protection, Inc.

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FL\ACT\MD001106\0001\00004\MD001106 MW01.dwg LAYOUT: 2-2 SAVED: 7/14/2017 2:15 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/27/2017 5:27 PM BY: BERNDGEN, WENDY
XREFS: IMAGES: PROJECTNAME: —
MD001106X00

LEGEND:

- W-7 — PLANT WELL
- GM-1 — MONITORING WELL
- GM-16S, GM-16M, GM-16D — WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
- OSRW-20 — APPROXIMATE LOCATION OF RESIDENTIAL WELL
- APPROXIMATE LOCATION OF WATER LINE
- CR-1 — APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
- S-1 — SURFACE WATER GAUGE
- SG1-5/10 — LOCATION OF SOIL GAS POINT
- SW7A — SURFACE WATER PERFORMANCE MONITORING LOCATION
- PW6D — PORE WATER PERFORMANCE MONITORING LOCATION
- GM 10S — GROUNDWATER PERFORMANCE MONITORING LOCATION
- Groundwater Use Notification Area

NOTES:
AOC=AREA OF CONCERN
SWMU=SOLID WASTE MANAGEMENT UNIT
TCE=TRICHLOROETHENE

SOURCES:
USGS SDTS ELKTON QUADRANGLE MAP
TOPO.COM VECTOR MAP
THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922

ATK ELKTON LLC
ELKTON, MARYLAND

SITE PLAN AND PERFORMANCE MONITORING LOCATIONS

ARCADIS

FIGURE
2-2

NORTHROP GRUMMAN

Northrop Grumman Corporation
Innovation Systems

Missile Products Division
Propulsion Systems and Controls (PS&C)
55 Thiokol Road
Elkton, Maryland 21921

Ref: RLZ-19-037

July 2, 2019

Elkton Building and Zoning Department
100 Railroad Avenue PO Box 157
Elkton, Maryland 21921

Subject: Off-Site Groundwater Use
Alliant Techsystems Operations LLC
USEPA ID #MDD 003 067 121

Dear Sir or Madam:

As you are aware an environmental investigation, performed under the direction of the United States Environmental Protection Agency (USEPA), has been completed for the Alliant Techsystems Operations LLC (Alliant) facility located at 55 Thiokol Road in Elkton, Maryland (the Site). As a result of this investigation, groundwater remediation is being conducted at the site. Alliant is implementing a Performance Monitoring Plan (PMP) and an Institutional and Engineering Controls Plan (IECP) as approved by USEPA to ensure that groundwater remediation is protective of human health and the environment.

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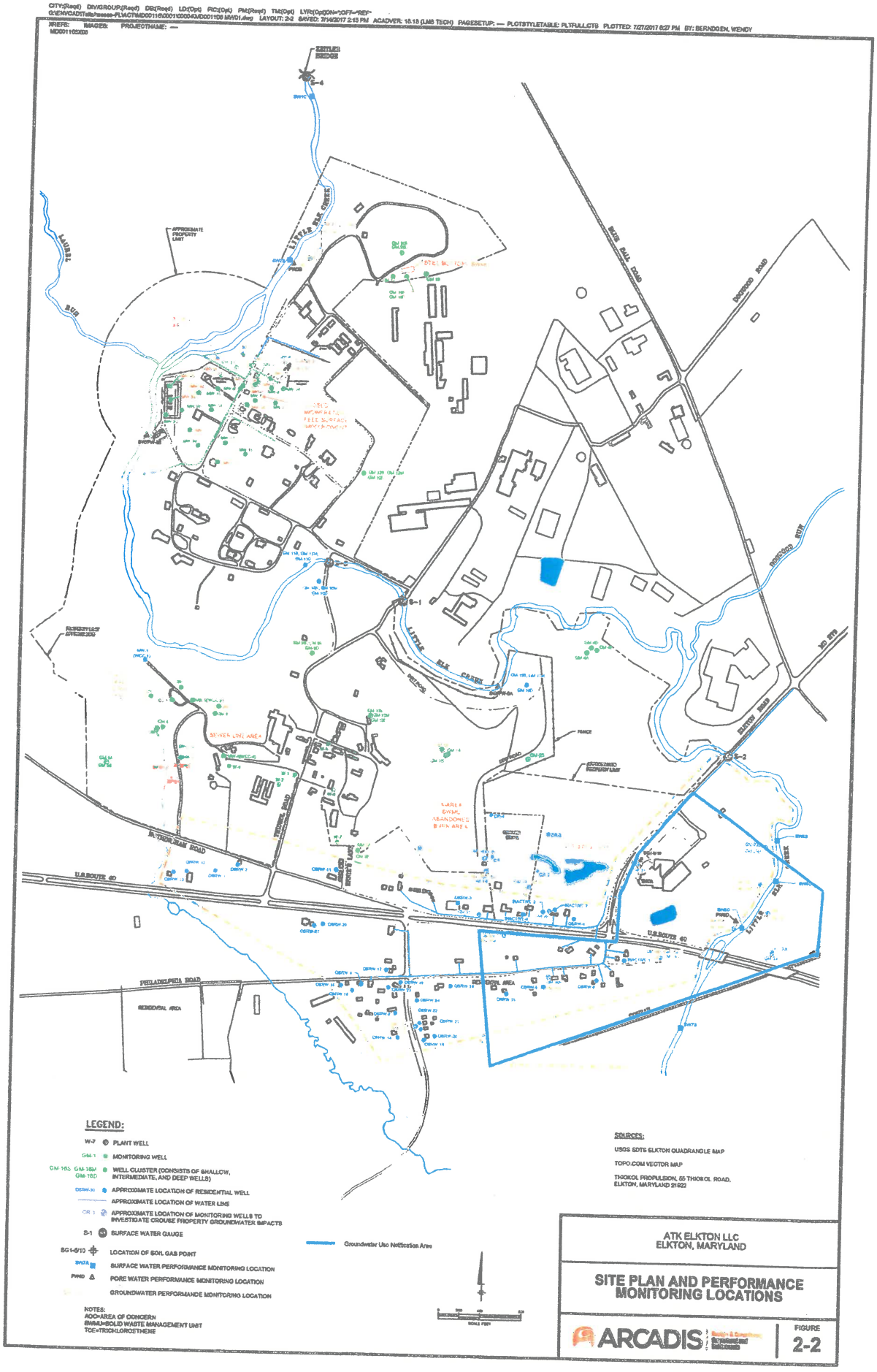
Should you have any questions regarding the remedial activities being performed at the site, or the groundwater quality in this area, please contact me at(410) 392-1626.

Very truly yours,

Richard L. Zambito, P.E.
Sr. Principal Engineer Environmental

Enclosure

Cc: Mr. Erich Weissbart, P.G., United States Environmental Protection Agency
Office of Remediation (3LC20), EPA Region III
Mr. Ed Hammerberg, Maryland Department of the Environment
Mr. George Crouse, Syngenta Crop Protection, Inc.


LEGEND:
W-7 PLANT WELL
GM-1 MONITORING WELL
GM-18S GM-18M GM-18D WELL CLUSTER (CONSISTS OF SHALLOW, INTERMEDIATE, AND DEEP WELLS)
RGWM-30 APPROXIMATE LOCATION OF RESIDENTIAL WELL
APPROXIMATE LOCATION OF WATER LINE
OW-1 APPROXIMATE LOCATION OF MONITORING WELLS TO INVESTIGATE CROUSE PROPERTY GROUNDWATER IMPACTS
S-1 SURFACE WATER GAUGE
SG1-5/10 LOCATION OF SOIL GAS POINT
SW7A SURFACE WATER PERFORMANCE MONITORING LOCATION
PWMD PORE WATER PERFORMANCE MONITORING LOCATION
GROUNDWATER PERFORMANCE MONITORING LOCATION
Groundwater Use Notification Area
NOTES:
AOC=AREA OF CONCERN
SWMU=SOLID WASTE MANAGEMENT UNIT
TCE=TRICHLOROETHENE
SOURCES:
USGS SDTS ELKTON QUADRANGLE MAP
TOPO.COM VECTOR MAP
THIOKOL PROPULSION, 55 THIOKOL ROAD, ELKTON, MARYLAND 21922
ATK ELKTON LLC
ELKTON, MARYLAND
SITE PLAN AND PERFORMANCE MONITORING LOCATIONS
ARCADIS
FIGURE
2-2

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Elkton Bldg + Zoning Dept.
Po Box 157
Elkton, MD 21921

9590 9402 2747 6351 8035 63

2. Article Number *(Transfer from service label)*

[illegible] 0004 3766 3397

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Hall son

C. Date of Delivery 7.12.19

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☑ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Cecil County Health Dept.
401 Bow St.
Elkton, MD 21921

9590 9402 2747 6351 8035 49

2. Article Number *(Transfer from service label)*

9 2820 0004 3766 3250

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery 7/11

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☑ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form **3811**, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

APPENDIX I

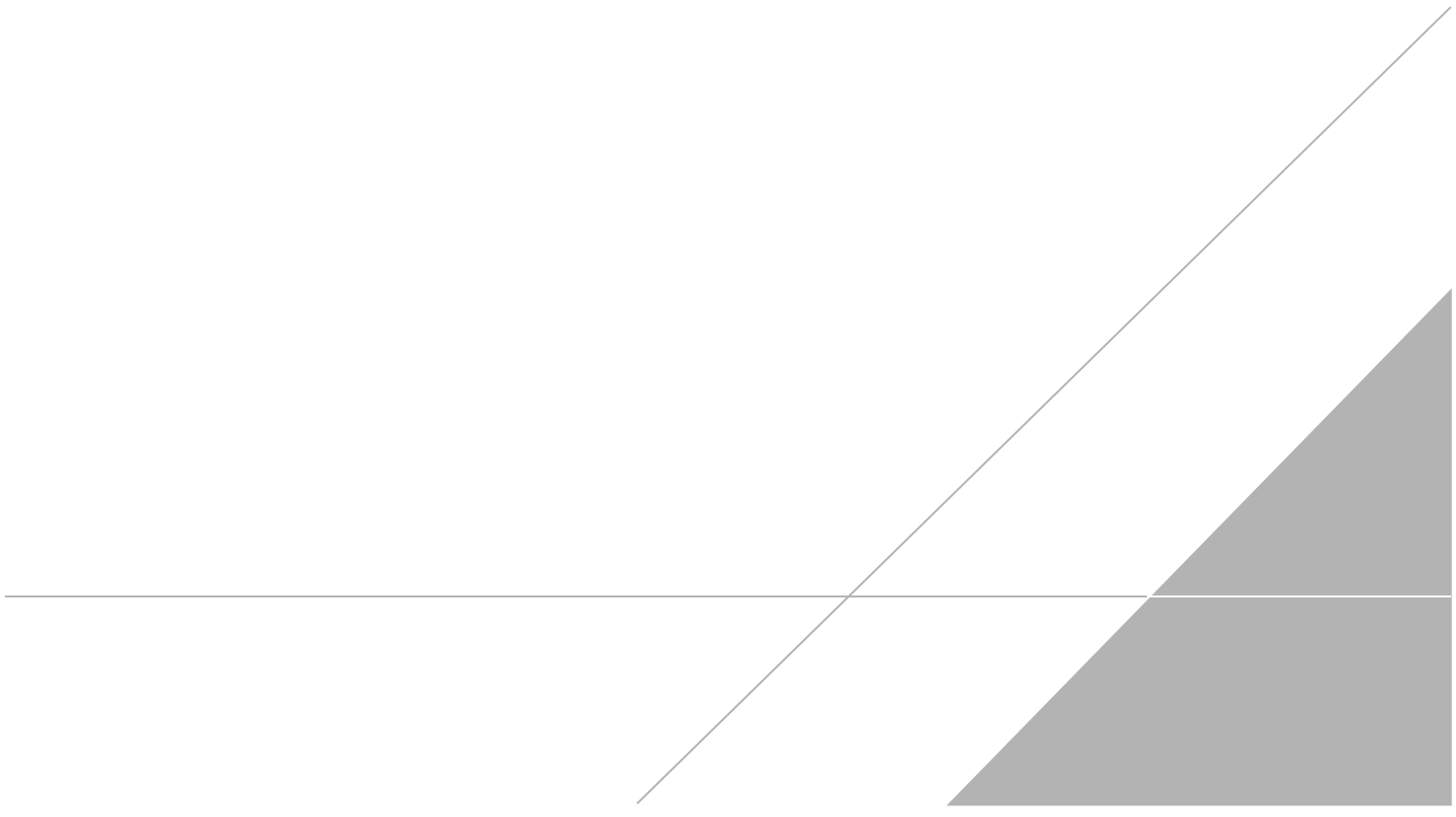
Historical Data

I-1 A-Area SWMU

I-2 Beryllium SWMU

I-3 C-Area SWMU

I-4 TCE-Area SWMU



Appendix I-1
A-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

Matrix:			Groundwater											
Location ID:			GM-1B	GM-1B	GM-1B	GM-1B	GM-1B	GM-1B	GM-15M	GM-15M	GM-15M	GM-15M	DUP-01 (GM-15M)	GM-15M
Sample ID:			GM1B(mmdd88)	GM1B(091694)	GM1B(111402)	GM1B(032204)	GM1B(03282018)	GM1B(03192019)	GM15M(091594)	GM15M(1114902)	GM15M(031504)	GM15M(03282018)	DUP01(03192019)	GM15M(03192019)
Sample Date:			mm/dd/1988	09/16/1994	11/14/2002	03/22/2004	03/28/2018	3/19/2019	09/15/1994	11/14/2002	03/15/2004	03/28/2018	3/19/2019	3/19/2019
Analyte	Units	CAO												
Anions														
Perchlorate	ug/L	14	--	--	**47.10**	**37.1**	**41 J**	**62**	--	**233**	**148 J**	**40**	**43**	**44**
SVOCs														
1,4-Dioxane	ug/L	0.46	--	--	--	**15**	**5.9**	**3.7**	--	--	< 5.0 U	--	--	--
VOCs														
1,1,1-Trichloroethane	ug/L	200	< 5.0 U	< 0.28 U	**0.95 J**	**1.2 J**	< 1.0 U	< 1.0 U	**0.59**	**0.95 J**	**0.71 J**	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	2.7	< 5.0 U	--	**--**	**1.3 J**	**1.7**	< 1.0 U	--	**1.4**	**1**	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	< 5.0 U	--	**1.8**	**2.2**	**1.5**	**1.8**		**0.41 J**	**0.44 J**	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	ug/L	15	--	--	--	--	< 1.0 U	< 1.0 U	--	--	--	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	--	--	< 1 U	< 2.0 U	< 1.0 U	< 1.0 U	--	< 1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	70	--	--	--	**4.7**	**1.9**	**1.6**	--	--	**2**	**0.55 J**	**0.56 J**	**0.67 J**
Trichloroethene	ug/L	5	**247**	**170**	**97 D**	**100**	**46**	**40**	**0.72**	**4**	**4.4**	**4.1**	**4.4**	**4.5**
Vinyl chloride	ug/L	2	--	--	< 1 U	< 2.0 U	< 1.0 U	< 1.0 U	--	< 1 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound

Appendix I-2
Beryllium SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

	Matrix:	Groundwater				Porewater		Surface Water		
	Location:	BS-1	BS-1	BS-1	BS-1	PW-02B	PW-02B	SW-2B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/18/2004	5/12/2004	3/23/2018	3/22/2019	3/26/2018	3/27/2019	3/26/2018	3/27/2019	3/27/2019
	Sample ID:	BS1(031804)	BS1(051204)	BS1(032318)	BS1(032219)	PW2B(032618)	PW2B(032719)	SW2B(032618)	DUP06(032719)	SW2B(032719)
	Sample Type:	N	N	N	N	N	N	N	N	N
Analyte	Units									
Anions										
Perchlorate	ug/L	**1260**	--	< 1.0 U	< 1.0 U	**0.41 J**	**0.42 J**	**0.61 J**	**0.83 J**	**0.80 J**
Sulfate	mg/L	--	--	**1.6**	**1200**	**16**	**9900**	--	--	--
Metals										
Aluminum	ug/L	**437**	--	**2900**	**320**	**68 J**	**2000**	**88 J**	**58 J**	**55 J**
Antimony	ug/L	< 60.0 U	--	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
Arsenic	ug/L	< 10.0 U	--	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
Barium	ug/L	**64.6 B**	--	**18**	**21**	**63**	**64**	**30**	**36**	**36**
Beryllium	ug/L	< 5.0 U	--	< 4.0 U	< 4.0 U	< 4.0 U	**0.16 J**	< 4.0 U	< 4.0 U	< 4.0 U
Cadmium	ug/L	< 5.0 U	--	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Calcium	ug/L	**6660**	--	**16000**	**35000**	**8700**	**7800**	**12000**	**13000**	**13000**
Chromium	ug/L	**6.1 B**	--	**9.4 J**	**3.0 J**	< 10 U	**12**	< 10 U	< 10 U	< 10 U
Cobalt	ug/L	**7.3 B**	--	**1.3 J**	**2.7 J**	**7.3 J**	**12**	< 10 U	< 10 U	< 10 U
Copper	ug/L	**5.1 B**	--	**5.6 J**	**6.5 JB**	< 20 U	**3.4 J**	< 20 U	< 20 U	< 20 U
Iron	ug/L	--	--	**210**	**200**	**6100**	**9900**		--	--
Iron (filtered)	ug/L	**744**	--	**2800**	**1800**	**6100**	**12000**	**230**	**160**	**140**
Lead	ug/L	< 3.0 U	--	< 10 U	< 10 U	< 10 U	**7.8 J**	< 10 U	**5.3 J**	< 10 U
Magnesium	ug/L	**6630**	--	**5100**	**10000**	**5700**	**5100**	**8800**	**8200**	**8000**
Manganese	ug/L	**72.6**	--	**13**	**230**	**390**	**820**	**24**	**31**	**30**
Mercury	ug/L	< 0.20 U	--	< 0.20 U	< 0.20 U	< 0.20 U	**0.12 JB**	< 0.20 U	**0.084 JB**	< 0.20 U
Nickel	ug/L	**37.1 B**	--	**5.4 J**	**5.5 J**	**14 J**	**21 J**	**3.9 J**	**3.1 J**	< 40 U
Potassium	ug/L	**134 B**	--	**1400**	**1100**	**690 J**	**900 J**	**2600**	**2100**	**2000**
Selenium	ug/L	< 5.0 U	--	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U	< 20 U
Silver	ug/L	< 10.0 U	--	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Sodium	ug/L	**5000**	--	**19000**	**24000**	**11000**	**12000**	**20000**	**15000**	**15000**
Thallium	ug/L	**4.9 B**	--	< 25 U	< 25 U	< 25 U	< 25 U	< 25 U	< 25 U	< 25 U
Vanadium	ug/L	< 50.0 U	--	**4.6 J**	**2.4 J**	< 10 U	**5.1 J**	< 10 U	< 10 U	< 10 U
Zinc	ug/L	**8.7 B**	--	< 20 U	**7.3 J**	**12 J**	**28**	< 20 U	< 20 U	< 20 U
SVOCs										
1,1-Biphenyl	ug/L	--	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
1,2,4-Trichlorobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,2-Dichlorobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,3-Dichlorobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,4-Dichlorobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.6 U	< 9.6 U	< 9.7 U	< 9.9 U
1,4-Dioxane	ug/L	**3 J**	--	--	--	--	--	--	--	--
2,2-Oxybis(1-Chloropropane)	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,4,5-Trichlorophenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,4,6-Trichlorophenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,4-Dichlorophenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,4-Dimethylphenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,4-Dinitrophenol	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
2,4-Dinitrotoluene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2,6-Dinitrotoluene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2-Chloronaphthalene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2-Chlorophenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2-Methyl-4,6-dinitrophenol	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
2-Methylnaphthalene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2-Methylphenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
2-Nitroaniline	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
2-Nitrophenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
3,3-Dichlorobenzidine	ug/L	< 50 U	--	< 59 U	< 58 U	< 59 U	< 60 U	R	< 58 U	< 59 U
3-Nitroaniline	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
4-Bromophenyl phenyl ether	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
4-Chloro-3-Methylphenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
4-Chlorophenyl phenyl ether	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
4-Methylphenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
4-Nitroaniline	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
4-Nitrophenol	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
Acenaphthene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Acenaphthylene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Acetophenone	ug/L		--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Anthracene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Atrazine	ug/L		--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzaldehyde	ug/L		--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzo(a)anthracene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzo(a)pyrene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzo(b)fluoranthene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzo(g,h,i)perylene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Benzo(k)fluoranthene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
bis(2-Chloroethoxy)methane	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
bis(2-Chloroethyl)ether	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
bis(2-Ethylhexyl)phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Butyl benzyl phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Caprolactam	ug/L		--	**30**	**87**	< 9.8 U	< 9.9 U	**2.5 J**	< 9.7 U	< 9.9 U
Carbazole	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Chrysene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Dibenzo(a,h)anthracene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Dibenzofuran	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Diethyl phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Dimethyl phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Di-n-butyl phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Di-n-octyl phthalate	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Fluoranthene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Fluorene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Hexachloro-1,3-butadiene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Hexachlorobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Hexachlorocyclopentadiene	ug/L	< 50 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Hexachloroethane	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Indeno(1,2,3-cd)pyrene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Isophorone	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Naphthalene	ug/L	< 10 U	--	--	--	--	--	--	--	--
Nitrobenzene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
N-Nitrosodi-n-propylamine	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
N-Nitrosodiphenylamine	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
p-Chloroaniline	ug/L	< 10 U	--	< 20 U	< 19 U	< 20 U	< 20 U	< 19 U	< 19 U	< 20 U
Pentachlorophenol	ug/L	< 50 U	--	< 49 U	< 48 U	< 49 U	< 50 U	< 48 U	< 49 U	< 49 U
Phenanthrene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Phenol	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U
Pyrene	ug/L	< 10 U	--	< 9.8 U	< 9.6 U	< 9.8 U	< 9.9 U	< 9.6 U	< 9.7 U	< 9.9 U

Appendix I-2
Beryllium SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

	Matrix:	Groundwater				Porewater		Surface Water		
	Location:	BS-1	BS-1	BS-1	BS-1	PW-02B	PW-02B	SW-2B	DUP-06 (SW-2B)	SW-2B
	Sample Date:	3/18/2004	5/12/2004	3/23/2018	3/22/2019	3/26/2018	3/27/2019	3/26/2018	3/27/2019	3/27/2019
	Sample ID:	BS1(031804)	BS1(051204)	BS1(032318)	BS1(032219)	PW2B(032618)	PW2B(032719)	SW2B(032618)	DUP06(032719)	SW2B(032719)
	Sample Type:	N	N	N	N	N	N	N	N	N
Analyte	Units									
SVOCs SIM										
Naphthalene	ug/L	--	--	< 0.20 U	--	< 0.20 U	--	< 0.20 U	--	--
TOC										
Total Organic Carbon	ug/L	--	--	**7**	**4000**	**1.5**	**1700**	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	ug/L	**150 D**	**110**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
1,1-Dichloroethane	ug/L	**86 D**	**73**	< 1.0 U	< 1.0 U	**0.69 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	**13**	**8.7**	< 1.0 U	< 1.0 U	**18**	**19**	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2,3-Trichloropropane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 9.7 U	< 9.9 U
1,2,4-Trimethylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromo-3-chloropropane	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromoethane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichlorobenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
1,2-Dichloroethane	ug/L	**0.27 J**	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethene, Total	ug/L	--	--	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
1,2-Dichloropropane	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichlorobenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
1,3-Dichloropropane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 9.7 U	< 9.9 U
2,2-Dichloropropane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone (MEK)	ug/L	< 5.0 U	< 25 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
2-Chloroethyl vinyl ether	ug/L	--	--	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
2-Chlorotoluene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-Pentanone	ug/L	< 5.0 U	< 25 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Acetone	ug/L	< 10 U	< 50 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Benzene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromobenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromochloromethane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	ug/L	< 2.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	ug/L	< 1.0 U	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Tetrachloride	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CFC-11	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CFC-12	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Chloroethane	ug/L	< 2.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	**2.8 J**	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	ug/L	< 2.0 U	< 10 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Cymene (p-Isopropyltoluene)	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	< 2.0 U	**2.2 B**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachloro-1,3-butadiene	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 9.7 U	< 9.9 U
Isopropylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methyl N-Butyl Ketone (2-Hexanone)	ug/L	< 5.0 U	< 25 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 UJ	< 10 U	< 10 U
Methyl-tert-butylether	ug/L	--	--	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
n-Butylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o,p-Xylene	ug/L	--	--	< 1.0 U	--	< 1.0 U	**--**	< 1.0 U	--	--
o-Xylene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene (Monomer)	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	ug/L	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	ug/L	**0.32 J**	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Total Xylenes	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl acetate	ug/L	--	--	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Vinyl chloride	ug/L	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.5**	< 1.0 U	< 1.0 U	< 1.0 U

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
-- - not analyzed or measured
CAO - corrective action objective
SIM - selective ion monitoring
SVOC - semi-volatile organic compound
VOC - volatile organic compound
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
-- - not analyzed or measured

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-01 MW-01-10142014 10/14/2014	CFMW-01 MW-01-05052015 5/5/2015	CFMW-01 MW-01-10122015 10/12/2015	CFMW-01 MW-01-06062016 6/6/2016	CFMW-01 MW-01-09262016 9/26/2016	CFMW-01 MW-01(04242017) 4/24/2017	CFMW-01 MW-01(10022017) 10/2/2017	CFMW-01 MW-1 (031918) 3/19/2018	CFMW-01 MW-1 (032019) 3/20/2019	CFMW-02 MW-02-05062014 5/6/2014	CFMW-02 MW-02-10142014 10/14/2014
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**14700**	**3610**	**455**	**9900**	**5200**	**1000**	**7500**	**180**	**240**	**975**	**1280**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**2880**	**2680**	**15100**	**1300**	**2800**	**2100**	**1500**	**41**	**34**	**16000**	**10800**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U	**3**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**885**	**427**	**384**	**360**	**820**	**470**	**560**	**16**	**12**	< 1.0 U	**700**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**2**	**4**	**2**	**4**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.3**	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	**57**	< 1.0 U	< 1.0 U	**4**	**24**	**2**	**24**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	< 1.0 U	**10**	**35**	**16**	**32**	**0.60 J**	**0.55 J**	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 1.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**4**	**8**	**4**	**8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**132**	< 1.0 U	< 1.0 U	**50**	**61**	**27**	**64**	**0.78 J**	**0.66 J**	< 1.0 U	< 1.0 U
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

			Groundwater										
			CFMW-02 MW-02-05052015 5/5/2015	CFMW-02 MW-02-10122015 10/12/2015	CFMW-02 MW-02-06062016 6/6/2016	CFMW-02 MW-02-09262016 9/26/2016	CFMW-02 MW-02(04242017) 4/24/2017	CFMW-02 MW-02(10022017) 10/2/2017	CFMW-02 MW-2 (032318) 3/23/2018	CFMW-02 DUP02 (032019) 3/20/2019	CFMW-02 MW-2 (032019) 3/20/2019	CFMW-05 MW-05-05072014 5/7/2014	CFMW-05 MW-05-10142014 10/14/2014
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**494**	**4970**	**150**	**210**	**190**	**68**	**86**	**960**	**1000**	**186**	**398**
Sulfate	mg/L	--	--	--	--	--	--	--	**6.8**	**8200**	**8200**	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	**120**	< 50 U	**18 J**	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	**2.6**	**1100**	**1100**	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**13600**	**3230**	**51000**	**13000**	**12000**	**8300**	**3800**	**47**	**43**	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U	< 0.5 U	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	< 1.0 U	**878**	**1600**	**750**	**210**	**340**	**52**	**1.1**	< 1.0 UH	**3.3**	**9.6**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**1**	< 0.5 U	< 0.5 U	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U	< 0.5 U	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	**170**	**150**	**37**	**32**	**16 J**	< 1.0 U	< 1.0 UH	< 1.0 U	**420**
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	**15**	**14**	< 0.5 U	**2**	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**19**	--	--	< 100 U	< 5.0 U	< 1.0 UH	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U	2	**19 J**	< 1.0 U	< 1.0 UH	**65.5**	**13.9**
Trichloroethene	ug/L	5	< 1.0 U	**107**	**29**	**24**	< 0.5 U	**27**	**18 J**	< 1.0 U	< 1.0 UH	**61**	**431**
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	**5**	< 0.5 U	**2**	< 20 U	< 1.0 U	< 1.0 UH	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-05 MW-05-05052015 5/5/2015	CFMW-05 MW-05-10122015 10/12/2015	CFMW-05 MW-05-06062016 6/6/2016	CFMW-05 MW-05-09262016 9/26/2016	CFMW-05 MW-05(04242017) 4/24/2017	CFMW-05 MW-05(10022017) 10/2/2017	CFMW-05 MW-5 (032318) 3/23/2018	CFMW-05 MW-5 (032219) 3/22/2019	CFMW-10 MW-10-04242014 4/24/2014	CFMW-10 MW-10-10142014 10/14/2014	CFMW-10 MW-10-05052015 5/5/2015
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**102**	**257**	**330**	**680**	**110**	**160**	**110**	**15**	**203**	**217**	**331**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	< 1.0 U	< 1.0 U	**1**	**1**	**3**	**2**	**0.63 J**	< 1.0 U	**1.86**	**3.52**	**16.1**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**2.21**	**4.57**	**6**	**9**	**2**	**5**	**3.6**	**0.60 J**	**5.57**	**14.8**	**2.89**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	**1.19**	< 1.0 U	**150**	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	**0.18**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	**49.1**	**52.6**	**53**	**16**	**21**	**240**	**22**	**29**	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**41**	**189**	**110**	**280**	**32**	**110**	**71**	**14**	**7.11**	**27.6**	**9.46**
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes:

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2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
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J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater									
			CFMW-10 MW-10-10122015 10/12/2015	CFMW-10 MW-10-06062016 6/6/2016	CFMW-10 MW-10-09262016 9/26/2016	CFMW-10 MW-10(04242017) 4/24/2017	CFMW-10 MW-10(10022017) 10/2/2017	CFMW-10 MW-10 (032318) 3/23/2018	CFMW-10 MW-10 (032019) 3/20/2019	CFMW-11 MW-11(3/30/1999) 3/30/1999	CFMW-11 MW-11(5/28/1999) 5/28/1999	CFMW-11 MW-11(9/27/1999) 9/27/1999
Analyte	**Units**	**CAO**										
Anions												
Perchlorate	ug/L	4	**214**	**200**	**180**	**290**	**82**	**200**	**46**	--	--	--
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--
Metals												
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--
TOC												
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1-Trichloroethane	ug/L	200	**1.33**	**8**	**5**	**25**	**8**	**21**	**0.45 J**	**280**	**106**	**154**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.700 U	< 0.700 U	< 0.700 U
1,1-Dichloroethene	ug/L	7	**8.65**	**8**	**15**	**11**	**3**	**8.4**	**5.9**	**66**	**40**	**46**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 0.5 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**14**	**3**	< 1.0 U	< 1.0 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.5 U	< 1.5 U	< 1.5 U
Chloroform	ug/L	80	**0.14**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	**6**	**3.2**	**4**
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U	< 0.7 U	< 0.7 U	< 0.7 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	**2.9**	< 2.2 U	**1.1**
Trichloroethene	ug/L	5	**9.7**	**14**	**30**	< 0.5 U	< 0.5 U	**5.6**	**7.8**	**13**	**12**	**11**
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.1 U	< 0.1 U	< 0.1 U

Notes:

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2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
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SVOC - semi-volatile organic compound
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Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater									
			CFMW-11 MW-11(12/17/1999) 12/17/1999	CFMW-11 MW-11(3/29/2000) 3/29/2000	CFMW-11 MW-11(6/16/2000) 6/16/2000	CFMW-11 MW-11(9/30/2000) 9/30/2000	CFMW-11 MW-11(11/28/2000) 11/28/2000	CFMW-11 MW-11(6/30/2001) 6/30/2001	CFMW-11 MW-11(9/28/2001) 9/28/2001	CFMW-11 MW-11(12/31/2001) 12/31/2001	CFMW-11 MW-11(3/31/2002) 3/31/2002	CFMW-11 MW-11(6/30/2002) 6/30/2002
Analyte	**Units**	**CAO**										
Anions												
Perchlorate	ug/L	4	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--
Metals												
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--
TOC												
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1-Trichloroethane	ug/L	200	**190**	**290**	**260**	**250**	**105**	**162**	**153**	**154**	**316**	**77**
1,1,2-Trichloroethane	ug/L	5	< 0.700 U	< 0.700 U	< 0.700 U	< 0.700 U	< 0.700 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**45**	**104**	**100**	**32**	**3.4**	**70**	**55**	**64**	**110**	**41**
1,2-Dichloroethane	ug/L	5	< 0.5 U	< 0.5 U	**0.7**	< 0.5 U	< 0.5 U	**0.8**	< 1.0 U	< 1.0 U	**0.6**	< 1.0 U
Benzene	ug/L	5	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**39**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 0.7 U	< 1.0 U	< 1.0 U	**2.4**	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	**2.6**	**8.2**	**8.7**	**2.4**	**2.8**	**5.7**	**4.7**	**5.7**	**8.8**	**3.2**
Dichloromethane	ug/L	5	**0.8**	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 1.0 U	< 1.0 U	< 1.0 U	**1**	< 1.0 U
Tetrachloroethene	ug/L	5	< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U	< 1.1 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.5**	< 1.0 U
Trichloroethene	ug/L	5	**12**	**23**	**22**	**13**	**13**	**12**	**11**	**13**	**14**	**7.6**
Vinyl chloride	ug/L	2	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 1.4 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater									
			CFMW-11 MW-11(9/30/2002) 9/30/2002	CFMW-11 MW-11(12/31/2002) 12/31/2002	CFMW-11 MW-11(3/31/2003) 3/31/2003	CFMW-12 MW-12-05062014 5/6/2014	CFMW-12 MW-12-10142014 10/14/2014	CFMW-12 MW-12-05052015 5/5/2015	CFMW-12 MW-12-10122015 10/12/2015	CFMW-12 MW-12-06062016 6/6/2016	CFMW-12 MW-12-09262016 9/26/2016	CFMW-12 MW-12(04242017) 4/24/2017
Analyte	**Units**	**CAO**										
Anions												
Perchlorate	ug/L	4	--	--	--	**1380**	**12900**	**1010**	**1790**	**190**	**3400**	**590**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--
Metals												
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--
TOC												
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1-Trichloroethane	ug/L	200	**104**	**103**	**157**	**2120**	**10300**	**2060**	**2580**	**460**	**7800**	**110**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U
1,1-Dichloroethene	ug/L	7	**36**	**19**	**25**	**216**	**865**	**160**	**359**	**67**	**610**	**11**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1**	< 0.5 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**36**	< 0.5 U
Chloroform	ug/L	80	**2.9**	**1.6**	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**13**	< 0.5 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6**	--
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2**	**15**	< 0.5 U
Trichloroethene	ug/L	5	**6.4**	**4.5**	**7.8**	**25.8**	< 1.0 U	< 1.0 U	< 1.0 U	**6**	**57**	< 0.5 U
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4**	**55**	< 0.5 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-12 MW-12(10022017) 10/2/2017	CFMW-12 MW-12 (031918) 3/19/2018	CFMW-12 MW-12 (032019) 3/20/2019	CFMW-13 MW-13-05072014 5/7/2014	CFMW-13 MW-13-10142014 10/14/2014	CFMW-13 MW-13-05052015 5/5/2015	CFMW-13 MW-13-10122015 10/12/2015	CFMW-13 MW-13-06062016 6/6/2016	CFMW-13 MW-13-09262016 9/26/2016	CFMW-13 MW-13(04242017) 4/24/2017	CFMW-13 MW-13(10022017) 10/2/2017
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**2200**	**550**	**350**	**627**	**364**	**930**	**824**	**190**	**310**	**660**	**50**
Sulfate	mg/L	--	--	**17**	**19000**	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	< 50 U	**17 J**	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	**1.5**	**1500**	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**2200**	**5.7**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**4**	**12**	**8**	**3**
1,1,2-Trichloroethane	ug/L	5	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	ug/L	7	**460**	**0.40 J**	< 1.0 U	**13.7**	**5.12**	**13.1**	**18.7**	**20**	**3**	**13**	**16**
1,2-Dichloroethane	ug/L	5	**1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U
Benzene	ug/L	5	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U
Carbon Tetrachloride	ug/L	5	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U
Chlorobenzene	ug/L	100	**6**	< 1.0 U	< 1.0 U	**725**	**102**	< 1.0 U	**815**	**430**	**36**	**660**	**450**
Chloroform	ug/L	80	**6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U
Dichloromethane	ug/L	5	--	< 5.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--
Tetrachloroethene	ug/L	5	**8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1**	< 1.0 U	< 0.5 U	**1**
Trichloroethene	ug/L	5	**44**	< 1.0 U	< 1.0 U	**378**	**50.8**	**194**	**291**	**170**	**26**	**330**	**110**
Vinyl chloride	ug/L	2	**9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1**	< 1.0 U	< 0.5 U	< 0.5 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
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SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-13 MW-13 (032318) 3/23/2018	CFMW-13 MW-13 (032019) 3/20/2019	CFMW-19 MW-19-05062014 5/6/2014	CFMW-19 MW-19-10132014 10/13/2014	CFMW-19 MW-19-05052015 5/5/2015	CFMW-19 MW-19-10122015 10/12/2015	CFMW-19 MW-19-06062016 6/6/2016	CFMW-19 MW-19-09262016 9/26/2016	CFMW-19 MW-19(04242017) 4/24/2017	CFMW-19 MW-19(10022017) 10/2/2017	CFMW-19 MW-19 (032318) 3/23/2018
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**400**	**250**	**925**	**1310**	**701**	**625**	**770**	**270**	**790**	**880**	**95**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	< 5.0 U	< 10 U	**5.51**	**21.9**	**3.57**	**7.89**	**7**	**8**	**7**	**8**	**5**
1,1,2-Trichloroethane	ug/L	5	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**7.7**	**8.4 J**	**16.5**	**32.7**	**16.2**	**19.7**	**16**	**24**	**16**	**18**	**14**
1,2-Dichloroethane	ug/L	5	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Benzene	ug/L	5	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Chlorobenzene	ug/L	100	**330**	**740**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Chloroform	ug/L	80	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.48**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Dichloromethane	ug/L	5	< 25 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U
Tetrachloroethene	ug/L	5	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U
Trichloroethene	ug/L	5	**210**	**350**	**2.92**	**6.58**	**2.94**	**3.93**	**3**	**5**	**3**	**3**	**2.5**
Vinyl chloride	ug/L	2	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U

Notes:

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Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-19 MW-19 (032219) 3/22/2019)	CFMW-20 MW-20-05072014 5/7/2014	CFMW-20 MW-20-10132014 10/13/2014	CFMW-20 MW-20-05052015 5/5/2015	CFMW-20 MW-20-10122015 10/12/2015	CFMW-20 MW-20-06062016 6/6/2016	CFMW-20 MW-20-09262016 9/26/2016	CFMW-20 MW-20(04242017) 4/24/2017	CFMW-20 MW-20(10022017) 10/2/2017	CFMW-20 DUP-02 (31918) 3/19/2018	CFMW-20 MW-20 (031918) 3/19/2018
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**650**	**17.4**	**884**	**36.7**	**47.1**	**20**	**1700**	**21**	**270**	**270**	**250**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**2.8**	**200**	**94.4**	**10.7**	**732**	**25**	**150**	**7**	**49**	**11**	**11**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**10**	**21.4**	**37.2**	**2.24**	**38**	**2**	**65**	**2**	**20**	**4.6**	**4.2**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	**1.09**	< 1.0 U	< 1.0 U	< 1.0 U	**2**	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	**1.66**	**2.22**	< 1.0 U	< 1.0 U	**2**	**2**	**1**	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**1.7**	**8.87**	**6.49**	**8.77**	**12.3**	**2**	**10**	**7**	**7**	**1.7**	**1.6**
Vinyl chloride	ug/L	2	< 1.0 U	**8.76**	**1.9**	**1.88**	**17.2**	**1.88**	**4**	< 0.5 U	**4**	< 1.0 U	< 1.0 U

Notes:

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Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-20 MW-20 (032019) 3/20/2019	CFMW-22 MW-22-05072014 5/7/2014	CFMW-22 MW-22-10132014 10/13/2014	CFMW-22 MW-22-05052015 5/5/2015	CFMW-22 MW-22-10122015 10/12/2015	CFMW-22 MW-22-06062016 6/6/2016	CFMW-22 MW-22-09262016 9/26/2016	CFMW-22 MW-22(04242017) 4/24/2017	CFMW-22 MW-22(10022017) 10/2/2017	CFMW-22 MW-22 (032318) 3/23/2018	CFMW-22 MW-22 (032019) 3/20/2019
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**480**	**176**	**8.07**	**94.5**	**47.8**	**100**	**2.1**	**150**	**140**	**120**	**24**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	**23**	**23000**
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	< 50 U	**57**
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	**0.86 J**	**680 J**
VOCs													
1,1,1-Trichloroethane	ug/L	200	**120**	**382**	**23.7**	**45.5**	**22.7**	**26**	**6**	**14**	**8**	**13**	**78**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**29**	**29.1**	**2.3**	< 1.0 U	**3.56**	**6**	**1**	**7**	**4**	**4.5**	**9.9**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	**0.55 J**	< 1.0 U	< 1.0 U	< 1.0 U	**0.15**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U
Tetrachloroethene	ug/L	5	**0.80 J**	**53.8**	**31.6**	**53.6**	**58.7**	**87**	**25**	**76**	**100**	**46**	**13**
Trichloroethene	ug/L	5	**5.8**	**44.8**	**18.5**	**80.8**	**59.7**	**55**	**19**	**150**	**97**	**60**	**21**
Vinyl chloride	ug/L	2	**3.9**	< 1.0 U	< 1.0 U	**1.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-23 MW-23-05072014 5/7/2014	CFMW-23 MW-23-10132014 10/13/2014	CFMW-23 MW-23-05052015 5/5/2015	CFMW-23 MW-23-10122015 10/12/2015	CFMW-23 MW-23-06062016 6/6/2016	CFMW-23 MW-23-09262016 9/26/2016	CFMW-23 MW-23(04242017) 4/24/2017	CFMW-23 MW-23(10022017) 10/2/2017	CFMW-23 DUP-01 (031618) 3/16/2018	CFMW-23 MW-23 (031618) 3/16/2018	CFMW-23 DUP03 (032219) 3/22/2019
Analyte	Units	CAO											
Anions													
Perchlorate	ug/L	4	**48.8**	**35.8**	**67.2**	**16.7**	**21**	**21**	**21**	**16**	**18**	**18**	**7.7**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**78.3**	**89.5**	**42.1**	**46.3**	**100**	**38**	**66**	**24**	**20**	**19**	**7.3**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**11.6**	**15.8**	**7.32**	**7.83**	**19**	**9**	**11**	**4**	**3.6**	**3.2**	**1.3**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**1.51**	**2.2**	**1.01**	**1.42**	**2**	**2**	**1**	< 0.5 U	**0.61 J**	**0.62 J**	< 1.0 U
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-23 MW-23 (032219) 3/22/2019	CFMW-25 MW-25-05072014 5/7/2014	CFMW-25 MW-25-10132014 10/13/2014	CFMW-25 MW-25-05052015 5/5/2015	CFMW-25 MW-25-10122015 10/12/2015	CFMW-25 MW-25-06062016 6/6/2016	CFMW-25 MW-25-09262016 9/26/2016	CFMW-25 MW-25(04242017) 4/24/2017	CFMW-25 MW-25(10022017) 10/2/2017	CFMW-25 MW-25 (032318) 3/23/2018	CFMW-25 MW-25 (032219) 3/22/2019
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**7.9**	**105**	**154**	**94.1**	**120**	**150**	**120**	**10**	**72**	**54**	**56**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--	**21**	**22000**
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	**19 J**	< 50 U
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--	**3.7**	**3100**
VOCs													
1,1,1-Trichloroethane	ug/L	200	**7.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**1.4**	**1.34**	< 1.0 U	< 1.0 U	< 1.0 U	**1**	**1**	**2**	< 0.5 U	**0.42 J**	< 1.0 U
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.14**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	< 1.0 U	**1.42**	**1.81**	**1.37**	**1.06**	**1**	**2**	**2**	< 0.5 U	**0.49 J**	< 1.0 U
Vinyl chloride	ug/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U

Notes:

1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
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J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-3
C-Area SWMU Historical Analytical Results
Alliant Techsystems Opetations LLC
Elkton, Maryland

			Groundwater										
			CFMW-28 MW-28-05062014 5/6/2014	CFMW-28 MW-28-10142014 10/14/2014	CFMW-28 MW-28-05052015 5/5/2015	CFMW-28 MW-28-10122015 10/12/2015	CFMW-28 MW-28-06062016 6/6/2016	CFMW-28 MW-28-09262016 9/26/2016	CFMW-28 MW-28(04242017) 4/24/2017	CFMW-28 MW-28(10022017) 10/2/2017	CFMW-28 MW-28 (031918) 3/19/2018	CFMW-28 MW-28 (032219) 3/22/2019	CFMW-29 MW-29-05062014 5/6/2014
Analyte	**Units**	**CAO**											
Anions													
Perchlorate	ug/L	4	**3810**	**1640**	**1580**	**1180**	**1600**	**1200**	**1400**	**1200**	**1700**	**160**	**3760**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	**38**	**26000**	--
Metals													
Iron	ug/L	--	--	--	--	--	--	--	--	--	**490**	**14000**	--
TOC													
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	**3.4**	**9200**	--
VOCs													
1,1,1-Trichloroethane	ug/L	200	**51**	**62.6**	**54**	**60.7**	**48**	**64**	**53**	**29**	**36**	**14**	**17.2**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**10.6**	**12.2**	**7.6**	**9.54**	**8**	**10**	**9**	**5**	**5.5**	**2.3**	**9.7**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	**0.64 J**	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	< 1.0 U	**0.87**	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	**0.57 J**	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U	< 1.0 U
Tetrachloroethene	ug/L	5	**1.01**	< 1.0 U	**1.06**	**1.14**	**1**	**1 J**	**1**	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**53.5**	**74**	**51.7**	**60.1**	**57**	**84**	**81**	**50**	**49**	**20**	**20.2**
Vinyl chloride	ug/L	2	**1.82**	**1.93**	**1.62**	**1.93**	**1**	**2**	**2**	< 0.5 U	< 1.0 U	**2.1**	**1.1**

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3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

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SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

			Groundwater								
			CFMW-29 MW-29-10132014 10/13/2014	CFMW-29 MW-29-05052015 5/5/2015	CFMW-29 MW-29-10122015 10/12/2015	CFMW-29 MW-29-06062016 6/6/2016	CFMW-29 MW-29-09262016 9/26/2016	CFMW-29 MW-29(04242017) 4/24/2017	CFMW-29 MW-29(10022017) 10/2/2017	CFMW-29 MW-29 (031918) 3/19/2018	CFMW-29 MW-29 (032219) 3/22/2019
Analyte	**Units**	**CAO**									
Anions											
Perchlorate	ug/L	4	**1480**	**2940**	**1730**	**2000**	**1400**	**2100**	**2100**	**2700**	**4100**
Sulfate	mg/L	--	--	--	--	--	--	--	--	--	--
Metals											
Iron	ug/L	--	--	--	--	--	--	--	--	--	--
TOC											
Total Organic Carbon	mg/L	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1-Trichloroethane	ug/L	200	**9.95**	**15.1**	**11**	**12**	**8**	**12**	**8**	**11**	**12**
1,1,2-Trichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	ug/L	7	**14.6**	**5.09**	**10.4**	**10**	**17**	**8**	**7**	**6.5**	**7.8**
1,2-Dichloroethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Benzene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chlorobenzene	ug/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Chloroform	ug/L	80	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Dichloromethane	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 5.0 U
Tetrachloroethene	ug/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U
Trichloroethene	ug/L	5	**12.1**	**19.2**	**16.5**	**17**	**10**	**18**	**15**	**15**	**17**
Vinyl chloride	ug/L	2	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U

Notes:

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2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

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U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound
*Last 4 years of data shown for C Area only.

Appendix I-4
TCE-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix:	Groundwater								
		Location ID:	GM-2B	GM-2B	GM-2B	GM-2B	GM-2B	GM-2B	GM-2B	GM-4B	GM-4B
		Sample ID:	GM2B(mmdd88)	GM2B(091594)	GM2B(111202)	GM2B(031704)	GM2B(052314)	GM2B (032918)	GM2B (032619)	GM4B(mmdd88)	GM4B (092094)
		Sample Date:	mm/dd/1988	09/15/1994	11/12/2002	03/17/2004	05/23/2014	03/29/2018	3/26/2019	mm/dd/1988	9/20/1994
		Sample Type:	N	N	N	N	N	N	N	N	N
Analyte	CAO	Units									
Anions											
Perchlorate	4	ug/L	--	--	**2020**	**1650**	**700**	< 1.0 U	< 1.0 U	--	--
SVOCs											
1,4-Dioxane	0.46	ug/L	--	--	--	**110**	**26**	**0.67**	**1.4**	**--**	--
VOCs											
1,1,1-Trichloroethane	200	ug/L	< 5.0 U	**580**	**370**	**370**	**140**	< 1.0 U	< 1.0 U	< 5.0 U	**12**
1,1-Dichloroethane	2.7	ug/L	**298**	--	**15 J**	**18 J**	**10**	< 1.0 U	< 1.0 U	< 5.0 U	**0.36**
1,1-Dichloroethene	7	ug/L	< 5.0 U	--	**340**	**390**	**180**	**0.50 J**	< 1.0 U	< 5.0 U	**3.2**
1,2,4-Trimethylbenzene	15	ug/L	--	--	--	--	< 1.0 U	< 1.0 U	< 1.0 U	--	--
Benzene	5	ug/L	--	--	< 50 U	< 50 U	< 0.50 U	< 1.0 U	< 1.0 U	--	--
cis-1,2-Dichloroethene	70	ug/L	--	--	--	**54**	**25**	**6.3**	**4.6**	--	--
Naphthalene	0.17	ug/L	--	--	--	--	< 1.0 U	--	< 0.20 U	--	--
Trichloroethene	5	ug/L	**3465**	**3100**	**2200**	**2600**	**950**	< 1.0 U	< 1.0 U	**23.1**	**36**
Vinyl chloride	2	ug/L	--	--	< 50 U	< 50 U	< 0.50 U	< 1.0 U	< 1.0 U	--	< 0.09

317 concentrations above the standard in Column D are shaded gray
526 Detections are boldfaced

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

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U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater							
		Location ID:	GM-4B	GM-4B	GM-9M	GM-9M	GM-9M	GM-9M	GM-10S	GM-10S
		Sample ID:	GM4B (03282018)	GM4B (03192019)	GM9M (091394)	GM9M (021099)	GM9M (031918)	GM9M (032019)	GM10S(091294)	GM10S(031804)
		Sample Date:	03/28/2018	3/19/2019	9/13/1994	2/10/1999	03/19/2018	3/20/2019	09/12/1994	03/18/2004
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**43**	**1.4**	**--**	**10**	**620**	**570**	--	**45.7**
SVOCs										
1,4-Dioxane	0.46	ug/L	**0.31 J**	< 0.40 U	**--**		**13 J**	**8.3**	--	**7.6**
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	< 1.0 U	**180**	**8.8**	**7**	**8**	**1.5**	**0.36 J**
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1.0 U	**57**	**23**	**18**	**18**	--	**2.7**
1,1-Dichloroethene	7	ug/L	< 1.0 U	< 1.0 U	**84**	**21**	**43**	**52**	--	**19**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	--	--	< 1.0 U	< 1.0 U	--	--
Benzene	5	ug/L	< 1.0 U	< 1.0 U	--	--	< 1.0 U	< 1.0 U	--	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	< 1.0 U	--	--	**2.8**	**2.6**	--	**0.21 J**
Naphthalene	0.17	ug/L	--	< 0.20 U	--	--	--	< 0.20 U	--	--
Trichloroethene	5	ug/L	**14**	**13**	**330**	**127**	**120**	**120**	**6**	**8.7**
Vinyl chloride	2	ug/L	< 1.0 U	< 1.0 U	< 1.8 U	< 5.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U

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SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater						
		Location ID:	GM-10S	GM-10S	GM-14S	GM-14S	GM-14S	GM-14S	GM-14S
		Sample ID:	GM10S (031918)	GM10S (032019)	GM14S(091694)	GM14S(031504)	GM14S (51.5) (051314)N	GM14S (56.5) (051314)N	GM14S (61.5) (051314)N
		Sample Date:	03/19/2018	3/20/2019	09/16/1994	03/15/2004	05/13/2014	05/13/2014	05/13/2014
		Sample Type:	N	N	N	N	N	N	N
Analyte	CAO	Units							
Anions									
Perchlorate	4	ug/L	**14**	**4.2**	--	**229 J**	**6.9**	**22**	**1.3 J**
SVOCs									
1,4-Dioxane	0.46	ug/L	**5.3 J**	**0.89**	--	**52**	**19**	**24**	**20**
VOCs									
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	< 1.0 U	**360**	**120**	**4.3**	**9.1**	**2.1**
1,1-Dichloroethane	2.7	ug/L	**3.4**	**0.88 J**	--	**5.1 J**	**13**	**11**	**15**
1,1-Dichloroethene	7	ug/L	**20**	**6.3**	--	**170**	**33**	**46**	**28**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 1.0 U	< 1.0 U	--	< 20 U	< 0.50 U	< 0.50 U	< 0.50 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	< 1.0 U	--	**13 J**	**100**	**86**	**130**
Naphthalene	0.17	ug/L	--	< 0.20 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	5	ug/L	**7.8**	**3**	**2100**	**570**	**64**	**140**	**13**
Vinyl chloride	2	ug/L	< 1.0 U	< 1.0 U	--	< 20 U	**9.1**	**7.6**	**14**

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Appendix I-4
TCE-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix:	Groundwater							
		Location ID:	GM-14S	GM-14S	GM-14S	GM-14M	GM-14M	GM-14M	GM-14M	GM-14M
		Sample ID:	GM14S (65.5) (051314)N	GM14S (03282018)	GM14S (03192019)	GM14M(091694)	GM14M	GM14M(031504)	GM14M(022305)	GM14M(033005)
		Sample Date:	05/13/2014	03/28/2018	3/19/2019	09/16/1994	11/14/2002	03/15/2004	02/23/2005	03/30/2005
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**1.5 J**	< 1.0 U	< 1.0 U	--	**1330**	**1240 J**	**1120**	**1370**
SVOCs										
1,4-Dioxane	0.46	ug/L	**25**	**11**	**9.8**	--	--	**92**	--	--
VOCs										
1,1,1-Trichloroethane	200	ug/L	**5.4**	**1**	**1.6**	**200**	**110**	**79**	**69**	**53**
1,1-Dichloroethane	2.7	ug/L	**15**	**8.2**	**9.2**	--	**11 J**	**8.5 J**	**8.9 J**	**9.8 J**
1,1-Dichloroethene	7	ug/L	**29**	**18**	**27**	--	**110**	**110**	**110**	**79**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	--	--	--	--	--
Benzene	5	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	--	< 33 U	< 40 U	< 40 U	< 10 U
cis-1,2-Dichloroethene	70	ug/L	**120**	**72**	**86**	--	--	**34 J**	--	--
Naphthalene	0.17	ug/L	< 1.0 U	--	< 0.20 U	--	--	--	--	--
Trichloroethene	5	ug/L	**19**	**7.1**	**8.4**	**1900**	**1400**	**1000**	**1200**	**1300 D**
Vinyl chloride	2	ug/L	**16**	**7.3**	**13**	--	< 33 U	< 40 U	< 40 U	< 10 U

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SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater					
		Location ID:	GM-14M	GM-14M	GM-14M	GM-14M	GM-14M	GM-14M
		Sample ID:	GM14M (103) (051314)N	GM14M (93) (051314)N	GM14M (98) (051314)N	GM14M(83)(051314)N	GM14M(88)(051314)N	GM14M (03282018)
		Sample Date:	05/13/2014	05/13/2014	05/13/2014	05/13/2014	05/13/2014	03/28/2018
		Sample Type:	N	N	N	N	N	N
Analyte	CAO	Units						
Anions								
Perchlorate	4	ug/L	< 4.0 U	**9.3**	**12**	< 4.0 U	**5.8**	< 1.0 UB
SVOCs								
1,4-Dioxane	0.46	ug/L	**12**	**9.5 J**	**9.3 J**	**15**	**20**	**6.1**
VOCs								
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	**0.81 J**	**0.71 J**	**0.66 J**	**0.74 J**	< 1.0 U
1,1-Dichloroethane	2.7	ug/L	**3.9**	**4.9**	**4.5**	**5.5**	**5.3**	**4.9**
1,1-Dichloroethene	7	ug/L	**0.75 J**	**2.9**	**2.5**	**2.3**	**2.6**	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	**0.25 J**	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	**7**	**19**	**16**	**21**	**20**	**1.7**
Naphthalene	0.17	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--
Trichloroethene	5	ug/L	**8**	**35**	**31**	**27**	**32**	**2.2**
Vinyl chloride	2	ug/L	**2.1**	**4.2**	**3.5**	**5**	**4.4**	**0.99 J**

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		Matrix:	Groundwater							
		Location ID:	GM-14M	GM-16S	GM-16S	GM-16S	GM-16S	GM-16S	GM-16S	GM-16M
		Sample ID:	GM14M (03192019)	GM16S(091594)	GM16S(021299)	GM16S(110702)	GM16S(032404)	GM16S (032718)	GM16S (032619)	GM16M(091494)
		Sample Date:	3/19/2019	09/15/1994	02/12/1999	11/07/2002	03/24/2004	03/27/2018	3/26/2019	09/14/1994
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**96**	--	**5**	**10.4**	**11.3**	**89**	**280**	--
SVOCs										
1,4-Dioxane	0.46	ug/L	**4.7**	--	--	--	< 5.0 U	**2**	**15**	--
VOCs										
1,1,1-Trichloroethane	200	ug/L	**4.5**	**1.5**	**1.3 J**	**1.3 J**	**1.1 J**	**1.9 J**	**30**	**2.5**
1,1-Dichloroethane	2.7	ug/L	**5.1**	--	--	< 2 U	< 2.0 U	< 5.0 U	**11**	--
1,1-Dichloroethene	7	ug/L	**28**	--	--	**2.7**	**3.3**	**14**	**100**	--
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	--	--	--	--	< 5.0 U	< 5.0 U	--
Benzene	5	ug/L	< 1.0 U	--	--	< 2 U	< 2.0 U	< 5.0 U	< 5.0 U	--
cis-1,2-Dichloroethene	70	ug/L	**40**	--	--	--	**0.64 J**	**8.2**	**150**	--
Naphthalene	0.17	ug/L	< 0.20 U	--	--	--	--	--	< 0.20 U	--
Trichloroethene	5	ug/L	**270**	**49**	**51**	**65**	**62**	**210**	**740**	**68**
Vinyl chloride	2	ug/L	**6.4**	--	--	< 2 U	< 2.0 U	< 5.0 U	**12**	--

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		Matrix:	Groundwater					
		Location ID:	GM-16M	GM-16M	GM-16M	GM-16M	GM-16M	GM-16M
		Sample ID:	GM16M(021299)	GM16M(110702)	GM16M(032404)	GM16M(051304)	GM16M(60.26) (052014)N	GM16M(65.26) (052014)N
		Sample Date:	02/12/1999	11/07/2002	03/24/2004	05/13/2004	05/20/2014	05/20/2014
		Sample Type:	N	N	N	N	N	N
Analyte	CAO	Units						
Anions								
Perchlorate	4	ug/L	**8**	**19.2**	--	**36.8**	**36**	**38**
SVOCs								
1,4-Dioxane	0.46	ug/L	--	--	**4.1 J**	--	**2.3 J**	< 9.8 U
VOCs								
1,1,1-Trichloroethane	200	ug/L	**2.5**	**2.1**	**2.9**	--	**1.4**	**1.5**
1,1-Dichloroethane	2.7	ug/L	--	< 2 U	**0.27 J**	--	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	--	**3.4**	**5.2**	--	**4.3**	**4.6**
1,2,4-Trimethylbenzene	15	ug/L	--	--	--	--	< 1.0 U	< 1.0 U
Benzene	5	ug/L	--	< 2 U	< 2.0 U	--	< 0.50 U	< 0.50 U
cis-1,2-Dichloroethene	70	ug/L	--	--	**1.3 J**	--	**0.99 J**	**0.95 J**
Naphthalene	0.17	ug/L	--	--	--	--	< 1.0 U	< 1.0 U
Trichloroethene	5	ug/L	**76**	**66**	**95**	--	**60**	**61**
Vinyl chloride	2	ug/L	--	< 2 U	< 2.0 U	--	< 0.50 U	< 0.50 U

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TCE-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix:	Groundwater							
		Location ID:	GM-16M	GM-16M	GM-16M	GM-21S	GM-21S	GM-21S	GM-21S	GM-21S
		Sample ID:	GM16M(70.26) (052014)N	GM16M (032718)	GM16M (032619)	GM21S(110502)	GM21S(032404)	GM21S(113006)	GM21S 052014)N	GM21S (032218)
		Sample Date:	05/20/2014	03/27/2018	3/26/2019	11/05/2002	03/24/2004	11/30/2006	05/20/2014	03/22/2018
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**33**	**54**	< 1.0 U	**510**	**532**	--	**890**	**690**
SVOCs										
1,4-Dioxane	0.46	ug/L	< 9.8 U	**1**	**0.18 J**	--	**120**	--	**48**	**19**
VOCs										
1,1,1-Trichloroethane	200	ug/L	**0.97 J**	**0.97 J**	< 1.0 U	**190**	**210**	**85**	**98**	**68**
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	**9.3 J**	**10 J**	**5.8 J**	**9.3**	**8.9 J**
1,1-Dichloroethene	7	ug/L	**3.4**	**4.6**	< 1.0 U	**220**	**320**	**120**	**240**	**180**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	--	--	--	< 5.0 U	< 10 U
Benzene	5	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 36 U	< 2.5 U	< 10 U
cis-1,2-Dichloroethene	70	ug/L	**0.75 J**	**0.96 J**	< 1.0 U	--	**27 J**	--	**23**	**20**
Naphthalene	0.17	ug/L	< 1.0 U	--	< 0.20 U	--	--	--	< 5.0 U	--
Trichloroethene	5	ug/L	**44**	**54**	**2.1**	**1100 D**	**1500**	**890**	**1200**	**980**
Vinyl chloride	2	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 36 U	< 2.5 U	< 10 U

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		Matrix:	Groundwater						
		Location ID:	GM-21S	GM-21M	GM-21M	GM-21M	GM-21M	GM-21M	GM-21M
		Sample ID:	GM21S (032519)	GM21M	GM21M(032404)	GM21M(41.5) (052014)N	GM21M(46.5) (052014)N	GM21M(51.5) (052014)N	GM21M (032218)
		Sample Date:	3/25/2019	11/05/2002	03/24/2004	05/20/2014	05/20/2014	05/20/2014	03/22/2018
		Sample Type:	N	N	N	N	N	N	N
Analyte	CAO	Units							
Anions									
Perchlorate	4	ug/L	**64**	**59.9**	**87.3**	**190**	**200**	**190**	**96**
SVOCs									
1,4-Dioxane	0.46	ug/L	**20**	--	**6.4**	**5.6 J**	**6.2 J**	**4.9 J**	**1.6**
VOCs									
1,1,1-Trichloroethane	200	ug/L	**72**	**5.2**	**6.2 J**	**3.5**	**3.8**	**3.6**	**1.4**
1,1-Dichloroethane	2.7	ug/L	**9.3 J**	< 5 U	< 10 U	**0.67 J**	**0.67 J**	**0.72 J**	**0.44 J**
1,1-Dichloroethene	7	ug/L	**210**	**12**	**17**	**14**	**15**	**14**	**7.7**
1,2,4-Trimethylbenzene	15	ug/L	< 10 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 10 U	< 5 U	< 10 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	**23**	--	**4.3 J**	**4.2**	**4.5**	**4.1**	**2.7**
Naphthalene	0.17	ug/L	< 1.0 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U	--
Trichloroethene	5	ug/L	**1100**	**190**	**230**	**220**	**230**	**230**	**100**
Vinyl chloride	2	ug/L	< 10 U	< 5 U	< 10 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U

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		Matrix:	Groundwater							
		Location ID:	GM-21M	GM-21M	GM-22S	GM-22S	GM-22S	GM-22S	GM-22S	GM-22M
		Sample ID:	DUP04 (032519)	GM21M (032519)	GM22S(110402)	GM22S(032304)	GM22S (052014)N	GM22S (032218)	GM22S (032519)	GM22M(110402)
		Sample Date:	3/25/2019	3/25/2019	11/04/2002	03/23/2004	05/20/2014	03/22/2018	3/25/2019	11/04/2002
		Sample Type:	FD	N	N	N	N	N	N	N
Analyte	**CAO**	**Units**								
Anions										
Perchlorate	4	ug/L	**210**	**220**	**230**	**183**	**97**	**67**	**61**	**189**
SVOCs										
1,4-Dioxane	0.46	ug/L	**3.6**	**3.1**	--	**150**	**33**	**13**	**13**	--
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	**2.7**	**780**	**610**	**170**	**94**	**95**	**960**
1,1-Dichloroethane	2.7	ug/L	**0.92 J**	**0.81 J**	**27 J**	**25 J**	< 5.0 U	**10**	**11**	**52 J**
1,1-Dichloroethene	7	ug/L	**14**	**15**	**780**	**750**	**350**	**240**	**270**	**930**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	--	--	< 5.0 U	< 10 U	< 10 U	--
Benzene	5	ug/L	< 1.0 U	< 1.0 U	< 50 U	< 100 U	< 2.5 U	< 10 U	< 10 U	< 100 U
cis-1,2-Dichloroethene	70	ug/L	**4**	**4.1**	--	**36 J**	**22**	**17**	**20**	--
Naphthalene	0.17	ug/L	< 0.20 U	< 0.20 U	--	--	< 5.0 U	--	< 0.20 U	--
Trichloroethene	5	ug/L	**190**	**190**	**3000**	**3200**	**1500**	**1000**	**1200**	**5100**
Vinyl chloride	2	ug/L	< 1.0 U	< 1.0 U	< 50 U	< 100 U	< 2.5 U	< 10 U	< 10 U	< 100 U

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VOC - volatile organic compound

Appendix I-4
TCE-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix:	Groundwater					
		Location ID:	GM-22M	GM-22M	GM-22M	GM-22M	GM-22M	GM-22M
		Sample ID:	GM22M(032304)	GM22M(113006)	GM22M(26.38) (052014)N	GM22M(31.38) (052014)N	GM22M(36.38) (052014)N	GM22M (032218)
		Sample Date:	03/23/2004	11/30/2006	05/20/2014	05/20/2014	05/20/2014	03/22/2018
		Sample Type:	N	N	N	N	N	N
Analyte	CAO	Units						
Anions								
Perchlorate	4	ug/L	**258**	--	**89**	**88**	**92**	**67**
SVOCs								
1,4-Dioxane	0.46	ug/L	**140**	--	**32**	**33**	**29**	**13**
VOCs								
1,1,1-Trichloroethane	200	ug/L	**1100**	**650**	**180**	**190**	**210**	**120**
1,1-Dichloroethane	2.7	ug/L	**39 J**	**24 J**	**13**	**12**	**14**	**12**
1,1-Dichloroethene	7	ug/L	**1200**	**700**	**350**	**360**	**390**	**270**
1,2,4-Trimethylbenzene	15	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	< 10 U
Benzene	5	ug/L	< 100 U	< 100 U	< 2.5 U	< 2.5 U	< 2.5 U	< 10 U
cis-1,2-Dichloroethene	70	ug/L	**65 J**	--	**23**	**24**	**25**	**20**
Naphthalene	0.17	ug/L	--	--	< 5.0 U	< 5.0 U	< 5.0 U	--
Trichloroethene	5	ug/L	**6400**	**4300**	**1600**	**1600**	**1700**	**1300**
Vinyl chloride	2	ug/L	< 100 U	< 100 U	< 2.5 U	< 2.5 U	< 2.5 U	< 10 U

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Appendix I-4
TCE-Area SWMU Historical Analytical Results
Alliant Techsystems Operations LLC
Elkton, Maryland

		Matrix:	Groundwater						
		Location ID:	GM-22M	GM-24	GM-24	GM-24	GM-24	GM-24	GM-24
		Sample ID:	GM22M (032519)	GM24(111902)	GM24(032204)	GM24 (79.8) (051414)N	GM24 (84.8) (051414)N	GM24 (87.8) (051414)N	GM24 (03282018)
		Sample Date:	3/25/2019	11/19/2002	03/22/2004	05/14/2014	05/14/2014	05/14/2014	03/28/2018
		Sample Type:	N	N	N	N	N	N	N
Analyte	CAO	Units							
Anions									
Perchlorate	4	ug/L	**71**	**362**	**342**	**180**	**170**	**160**	**140**
SVOCs									
1,4-Dioxane	0.46	ug/L	**16**	--	**4.3 J**	< 9.8 U	< 9.8 U	< 10 U	**0.44**
VOCs									
1,1,1-Trichloroethane	200	ug/L	**150**	**5.6**	**8.8**	**0.59 J**	**0.63 J**	**0.65 J**	**0.54 J**
1,1-Dichloroethane	2.7	ug/L	**14**	**0.31 J**	**0.47 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	**340**	**3.2**	**5.4**	**1.2**	**1.5**	**1.3**	**2.1**
1,2,4-Trimethylbenzene	15	ug/L	< 10 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 10 U	< 2 U	< 1.0 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	**26**	--	**1.5**	< 1.0 U	**0.50 J**	< 1.0 U	**0.45 J**
Naphthalene	0.17	ug/L	< 0.20 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U	--
Trichloroethene	5	ug/L	**1500**	**46**	**68**	**22**	**24**	**21**	**27**
Vinyl chloride	2	ug/L	< 10 U	< 2 U	< 1.0 U	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U

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SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater							
		Location ID:	GM-24	GM-26S	GM-26S	GM-26S	GM-26S	GM-26S	GM-26M	GM-26M
		Sample ID:	GM24 (03192019)	GM26S(110502)	GM26S(031904)	GM26S (052114)N	GM26S (032718)	GM26S (032619)	GM26M(110502)	GM26M(031904)
		Sample Date:	3/19/2019	11/05/2002	03/19/2004	05/21/2014	03/27/2018	3/26/2019	11/05/2002	03/19/2004
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**130**	**19.2**	**6.7**	**100**	**98**	**110**	**101**	**113**
SVOCs										
1,4-Dioxane	0.46	ug/L	< 0.40 U	--	< 5.0 U	< 11 U	**1.2**	**2.1**	--	**6.6**
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	**0.36 J**	**0.33 J**	**1.3**	**1.1**	< 1.0 U	**6.2**	**5.9 J**
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1 U	< 1.0 U	< 1.0 U	**0.43 J**	< 1.0 U	**0.62 J**	< 10 U
1,1-Dichloroethene	7	ug/L	**2**	**0.88 J**	**0.86 J**	**4.9**	**6**	**8.6**	**13**	**15**
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	--	--	< 1.0 U	< 1.0 U	< 1.0 U	--	--
Benzene	5	ug/L	< 1.0 U	< 1 U	< 1.0 U	< 0.50 U	< 1.0 U	< 1.0 U	< 5 U	< 10 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	--	**0.31 J**	**4.7**	**3.7**	**5.1**	--	**6.6 J**
Naphthalene	0.17	ug/L	< 0.20 U	--	--	< 1.0 U	--	< 0.20 U	--	--
Trichloroethene	5	ug/L	**20**	**18**	**15**	**120**	**110**	**150**	**290**	**280**
Vinyl chloride	2	ug/L	< 1.0 U	< 1 U	< 1.0 U	< 0.50 U	< 1.0 U	< 1.0 U	< 5 U	< 10 U

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SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater						
		Location ID:	GM-26M	GM-26M	GM-26M	GM-26M	GM-26M	GM-27	GM-27
		Sample ID:	GM26M(80) (052114)N	GM26M(85) (052114)N	GM26M(89) (052114)N	GM26M (032718)	GM26M (032619)	GM27(040104)	GM27(022305)
		Sample Date:	05/21/2014	05/21/2014	05/21/2014	03/27/2018	3/26/2019	04/01/2004	02/23/2005
		Sample Type:	N	N	N	N	N	N	N
Analyte	CAO	Units							
Anions									
Perchlorate	4	ug/L	**160**	**160**	**160**	**110**	**96**	< 4.0 U	< 1.0 U
SVOCs									
1,4-Dioxane	0.46	ug/L	**5.5 J**	< 10 U	< 10 U	**1.5**	**2.6**	< 5.0 U	--
VOCs									
1,1,1-Trichloroethane	200	ug/L	**3**	**2.9**	**3**	**1.9**	< 1.0 U	< 10 U	< 1.0 U
1,1-Dichloroethane	2.7	ug/L	**0.84 J**	**0.79 J**	**0.78 J**	**0.72 J**	**0.67 J**	< 10 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	**12**	**12**	**12**	**11**	**10**	< 10 U	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	--
Benzene	5	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	**8.5**	**8.4**	**8.1**	**4.7**	**4.9**	< 10 U	--
Naphthalene	0.17	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	--	< 0.20 U	--	--
Trichloroethene	5	ug/L	**270**	**240**	**260**	**170**	**180**	< 10 U	< 1.0 U
Vinyl chloride	2	ug/L	< 0.50 U	< 0.50 U	< 0.50 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U

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SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Groundwater							
		Location ID:	GM-27	GM-27	GM-27	GM-30M	GM-30M	GM-30M	GM-30M	GM-30M
		Sample ID:	GM27 (052014)N	GM27 (032218)	GM27 (032119)	GM30M(032704)	GM30M(051304)	GM30M (052214)N	GM30M (032918)	GM30M (032619)
		Sample Date:	05/20/2014	03/22/2018	3/21/2019	03/26/2004	05/13/2004	05/22/2014	03/29/2018	3/26/2019
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	< 4.0 U	< 1.0 U	< 1.0 U	**4.9**	**6.3**	**13**	**14**	< 1.0 U
SVOCs										
1,4-Dioxane	0.46	ug/L	< 9.5 U	< 0.42 U	< 0.40 U	< 5.0 U	--	< 11 U	< 0.40 U	< 0.40 U
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	**0.21 J**	--	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	**1.5**	--	--	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	< 1.0 U	--	< 0.50 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	0.17	ug/L	< 1.0 U	--	< 0.20 U	--	--	< 1.0 U	--	< 0.20 U
Trichloroethene	5	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	**2.1**	--	**9.3**	**5.8**	**0.70 J**
Vinyl chloride	2	ug/L	< 0.50 U	< 1.0 U	< 1.0 U	< 1.0 U	--	< 0.50 U	< 1.0 U	< 1.0 U

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		Matrix:	Groundwater							
		Location ID:	GM-31S	GM-31S	GM-31S	GM-31S	GM-31M	GM-31M	GM-31M	GM-31M
		Sample ID:	GM31S(031904)	GM31S(051104)	GM31S (032218)	GM31S (032619)	GM31M(031904)	GM31M (032218)	DUP05 (032619)	GM31M (032619)
		Sample Date:	03/19/2004	05/11/2004	03/22/2018	3/26/2019	03/19/2004	03/22/2018	3/26/2019	3/26/2019
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**4.8**	< 4.0 U	< 1.0 U	< 1.0 U	< 4.0 U	< 1.0 U	< 1.0 U	< 1.0 U
SVOCs										
1,4-Dioxane	0.46	ug/L	< 5.0 U	--	< 0.42 U	< 0.40 U	< 5.0 U	< 0.42 U	< 0.40 U	< 0.40 U
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	--	--	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	0.17	ug/L	--	--	--	< 0.20 U	--	--	< 0.20 U	< 0.20 U
Trichloroethene	5	ug/L	**0.11 J**	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	2	ug/L	< 1.0 U	--	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

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		Matrix:	Groundwater							Porewater
		Location ID:	GM-32	GM-32	GM-32	GM-32	GM-32D	GM-32D	GM-32D	PW-06C
		Sample ID:	GM32(032504)	GM32(052314)N	GM32 (032718)	GM32 (032519)	GM32D(060914)N	GM32D (032718)	GM32D (032519)	PW6C (032618)
		Sample Date:	03/25/2004	05/23/2014	03/27/2018	3/25/2019	06/09/2014	03/27/2018	3/25/2019	03/26/2018
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	< 4.0 U	**2.6 J**	**5.4**	**11**	< 4.0 U	< 1.0 U	< 1.0 U	**30**
SVOCs										
1,4-Dioxane	0.46	ug/L	< 5.0 U	< 10 U	**0.25 J**	**0.91**	< 9.9 U	< 0.40 U	< 0.40 U	**1.1**
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.51 J**
1,1-Dichloroethene	7	ug/L	**0.41 J**	< 1.0 U	**0.61 J**	**1.4**	< 1.0 U	< 1.0 U	< 1.0 U	**4**
1,2,4-Trimethylbenzene	15	ug/L	--	< 1.0 U	< 1.0 U	< 1.0 U	**6.7**	**0.54 J**	< 1.0 U	< 1.0 U
Benzene	5	ug/L	**0.11 J**	< 0.50 U	< 1.0 U	< 1.0 U	**17**	**0.84 J**	**0.68 J**	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	**0.42 J**	**1.8**	**1.4**	**1.6**	< 1.0 U	< 1.0 U	< 1.0 U	**1.2**
Naphthalene	0.17	ug/L	--	< 1.0 U	--	< 0.20 U	**5.8**	--	**0.31**	--
Trichloroethene	5	ug/L	**7**	**11**	**16**	**25**	< 0.50 U	< 1.0 U	< 1.0 U	**62**
Vinyl chloride	2	ug/L	< 1.0 U	< 0.50 U	< 1.0 U	< 1.0 U	< 0.50 U	< 1.0 U	< 1.0 U	< 1.0 U

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		Matrix:	Porewater			Surface Water			
		Location ID:	PW-06C	PW-06D	PW-06D	SW-6B	SW-6B	SW-6B	SW-6C
		Sample ID:	PW6C (032719)	PW6D (032618)	PW6D (032719)	SW6B (113006)	SW6B (032618)	SW6B (032718)	SW6C (113006)
		Sample Date:	3/27/2019	03/26/2018	3/27/2019	11/30/2006	03/26/2018	3/27/2019	11/30/2006
		Sample Type:	N	N	N	N	N	N	N
Analyte	CAO	Units							
Anions									
Perchlorate	4	ug/L	**28**	**2.5**	**57**	**--**	**2.1**	**1.6**	**--**
SVOCs									
1,4-Dioxane	0.46	ug/L	**4.7**	< 0.50 U	**3.7**	--	< 0.40 U	< 0.40 U	--
VOCs									
1,1,1-Trichloroethane	200	ug/L	**27**	< 1.0 U	**11**	0.13	< 1.0 U	< 1.0 U	**0.17**
1,1-Dichloroethane	2.7	ug/L	**3.5**	< 1.0 U	**2.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	**77**	**0.46 J**	**37**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	--
Benzene	5	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	--
cis-1,2-Dichloroethene	70	ug/L	**8.1**	< 1.0 U	**8.3**	--	< 1.0 U	< 1.0 U	--
Naphthalene	0.17	ug/L	< 0.20 U	--	< 0.20 U	--	--	< 0.20 U	--
Trichloroethene	5	ug/L	**370**	**6.1**	**160**	**6.9**	**4.4**	**3.8**	**7.8**
Vinyl chloride	2	ug/L	< 1.0 U	< 1.0 U	**2**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U

317 concentrations above the standard in Column D are shaded gray
526 Detections are boldfaced

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound

		Matrix:	Surface Water							
		Location ID:	SW-6C	SW-6C	SW-6D	SW-6D	SW-6D	SW-7B	SW-7B	SW-7B
		Sample ID:	SW6C (032618)	SW6C (032719)	SW6D (113006)	SW6D (032618)	SW6D (032719)	SW7B (113006)	SW7B (032618)	SW7B (032719)
		Sample Date:	03/26/2018	3/27/2019	11/30/2006	03/26/2018	3/27/2019	11/30/2006	03/26/2018	3/27/2019
		Sample Type:	N	N	N	N	N	N	N	N
Analyte	CAO	Units								
Anions										
Perchlorate	4	ug/L	**2.2**	**1.5**	--	**2.7**	**4.4**	--	**2.7**	**2**
SVOCs										
1,4-Dioxane	0.46	ug/L	< 0.40 U	< 0.40 U	--	< 0.40 U	**1.6**	--	< 0.40 U	< 0.40 U
VOCs										
1,1,1-Trichloroethane	200	ug/L	< 1.0 U	< 1.0 U	**0.45**	< 1.0 U	**5.4**	0.75	< 1.0 U	< 1.0 U
1,1-Dichloroethane	2.7	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	7	ug/L	< 1.0 U	< 1.0 U	**0.43**	**0.51 J**	**16**	**0.85**	**0.46 J**	< 1.0 U
1,2,4-Trimethylbenzene	15	ug/L	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U
Benzene	5	ug/L	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U	--	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	70	ug/L	< 1.0 U	< 1.0 U	--	< 1.0 U	**14**	--	< 1.0 U	< 1.0 U
Naphthalene	0.17	ug/L	--	< 0.20 U	--	--	< 0.20 U	--	--	< 0.20 U
Trichloroethene	5	ug/L	**4.8**	**4.6**	**9.3**	**6.2**	**24**	**11**	**5.9**	**4.7**
Vinyl chloride	2	ug/L	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	< 1.0 U	< 1.0 U	< 1.0 U

317 concentrations above the standard in Column D are shaded gray
526 Detections are boldfaced

Notes:
1. Values exceeding laboratory reporting limits are bolded. Vales exceeding the numerical Corrective Action Objective goals are highlighted in gray.
2. Water quality parameters are measured in the field during each purge event.
3. CAO applies only to groundwater and porewater and was not compared to surface water samples.

µg/L - microgram per liter
CAO - Corrective Action Objective
-- - not analyzed or measured
B - Compound was found in the blank and in the sample
D - Indicates all compounds identified in an analysis at a secondary dilution factor
J - Indicates an estimated result
U - Indicates the analyte was analyzed but not detected above the detection limit
SVOC - semi-volatile organic compound
VOC - volatile organic compound

APPENDIX J

Trend Analysis

ARCADIS Design & Consultancy for natural and built assets

TABLE J-1
Summary Statistics and Trend Results[1,2]
Alliant Techsystems Operations LLC
Elkton, Maryland
April 2019

Well ID	Analyte	Figure	Detected Results Summary [1]				Mann-Kendall Test [2]			
			Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
GM-1B	1,1-DCE	I-1	1.5 - 5	35.8	1.8	1.442	NST	5a	0.242	-5
GM-1B	Perchlorate	I-2	37.1 - 62	18.7	44.05	10.94	NST	5a	0.367	2
GM-1B	TCE	I-3	40 - 247	208	98.5	79.21	DWN	5a	0.008	-13
GM-2B	1,1,1-TCA	I-4	1 - 580	76.1	140	231.8	NST	5a	0.062	-11
GM-2B	1,4-Dioxane	I-5	0.67 - 110	77.7	13.7	51.68	NST	5a	0.167	-4
GM-2B	TCE	I-6	1 - 3465	13.7	2200	1440	DWN	5a	0.001	-18
GM-4B	TCE	I-7	13 - 36	78.1	18.55	10.67	NST	5a	0.167	-4
GM-9M	1,1-DCA	I-8	18 - 57	22.4	20.5	18.81	NST	5a	0.167	-5
GM-9M	1,1-DCE	I-9	21 - 84	2620	47.5	26.14	NST	5a	0.625	0
GM-9M	TCE	I-10	120 - 330	688	123.5	103.9	NST	5a	0.167	-5
GM-10S	TCE	I-11	3 - 8.7	789	6.9	2.514	NST	5a	0.375	-2
GM-14M	1,1-DCA	I-12	4.9 - 11	111	8.5	2.477	DWN	--	0.035	-13
GM-14M	1,1-DCE	I-13	1 - 110	1300	79	51.05	DWN	--	0.015	-14
GM-14M	1,1,1-TCA	I-14	0.66 - 200	13.3	61	68.14	DWN	--	0.003	-22
GM-14M	1,4-Dioxane	I-15	4.7 - 92	19.8	10.55	41.95	DWN	--	0.042	-6
GM-14M	Perchlorate	I-16	1 - 1370	2630	1120	663.6	NST	--	0.068	-11
GM-14M	TCE	I-17	2.2 - 1900	21.1	1100	704.5	DWN	--	0.016	-18
GM-14S	1,1-DCA	I-18	5.1 - 11	61.4	8.7	2.472	NST	5a	0.375	2
GM-14S	1,1-DCE	I-19	18 - 170	403	36.5	70.8	NST	5a	0.167	-4
GM-14S	1,1,1-TCA	I-20	1 - 360	131	9.1	154.7	DWN	5a	0.042	-8
GM-14S	1,4-Dioxane	I-21	9.8 - 52	1110	17.5	19.62	DWN	5a	0.042	-6
GM-14S	cis-1,2-DCE	I-22	13 - 86	194	79	34.8	NST	5a	0.375	3
GM-14S	TCE	I-23	7.1 - 2100	132	140	888.5	DWN	5a	0.042	-8
GM-15M	Perchlorate	I-24	40 - 233	176	96	92.51	NST	5a	0.167	-4
GM-16M	1,1-DCE	I-25	1 - 5.2	25.6	4.6	1.676	NST	--	0.408	-3
GM-16M	1,1,1-TCA	I-26	0.97 - 2.9	223	2.1	0.774	DWN	--	0.035	-12
GM-16M	Perchlorate	I-27	1 - 54	57.1	28	20.2	NST	--	0.235	5
GM-16M	TCE	I-28	2.1 - 95	7170	66	28.78	DWN	--	0.035	-13
GM-16S	1,1,1-TCA	I-29	1.1 - 30	542	1.4	11.67	NST	5a	0.235	4
GM-16S	Perchlorate	I-30	5 - 280	1060	11.3	117.5	UP	5a	0.008	10
GM-16S	TCE	I-31	49 - 740	463	63.5	273.5	UP	5a	0.008	13
GM-21M	1,1-DCE	I-32	7.7 - 17	4100	15	3.623	NST	5a	0.592	-1
GM-21M	1,1,1-TCA	I-33	1.4 - 6.2	15.5	3.8	1.915	NST	5a	0.117	-6
GM-21M	1,4-Dioxane	I-34	1.6 - 6.4	15.7	4.65	2.363	NST	5a	0.167	-4
GM-21M	Perchlorate	I-35	59.9 - 220	158	96	72.21	UP	5a	0.042	8
GM-21M	TCE	I-36	100 - 230	463	190	53.1	NST	5a	0.408	-2
GM-21S	1,1-DCA	I-37	5.8 - 10	4100	9.3	1.496	NST	5a	0.360	-2
GM-21S	1,1-DCE	I-38	120 - 320	15.5	215	66.26	NST	5a	0.360	-3
GM-21S	1,1,1-TCA	I-39	68 - 210	15.7	91.5	62.79	NST	5a	0.068	-9
GM-21S	1,4-Dioxane	I-40	19 - 120	158	34	47.44	NST	5a	0.167	-4
GM-21S	Perchlorate	I-41	64 - 890	4010	532	305.2	NST	5a	0.592	0
GM-21S	TCE	I-42	890 - 1500	7.3	1110	211.5	NST	5a	0.360	-2

ARCADIS Design & Consultancy for natural and built assets

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			Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
GM-22M	1,1-DCA	I-43	12 - 52	4100	19	16.63	DWN	5a	0.028	-10
GM-22M	1,1-DCE	I-44	270 - 1200	15.5	530	375.6	DWN	5a	0.028	-11
GM-22M	1,1,1-TCA	I-45	120 - 1100	15.5	420	436.4	DWN	5a	0.028	-11
GM-22M	1,4-Dioxane	I-46	13 - 140	15.7	24.5	60.31	NST	5a	0.167	-4
GM-22M	Perchlorate	I-47	67 - 258	158	88	85.11	NST	5a	0.117	-6
GM-22M	TCE	I-48	1300 - 6400	463	2950	2189	DWN	5a	0.028	-11
GM-22S	1,1-DCA	I-49	5 - 27	4100	11	9.788	NST	5a	0.242	-4
GM-22S	1,1-DCE	I-50	240 - 780	15.5	350	265.3	DWN	5a	0.042	-8
GM-22S	1,1,1-TCA	I-51	94 - 780	15.7	170	322.3	DWN	5a	0.042	-8
GM-22S	1,4-Dioxane	I-52	13 - 150	158	23	65.85	NST	5a	0.167	-5
GM-22S	Perchlorate	I-53	61 - 230	4010	97	75.17	DWN	5a	0.008	-10
GM-22S	TCE	I-54	1000 - 3200	7.3	1500	1040	NST	5a	0.117	-6
GM-24	1,1-DCE	I-55	1.3 - 5.4	15.5	2.1	1.605	NST	5a	0.242	-4
GM-24	1,1,1-TCA	I-56	0.54 - 8.8	15.5	1	3.724	NST	5a	0.242	-4
GM-24	Perchlorate	I-57	130 - 362	158	160	115	DWN	5a	0.008	-10
GM-24	TCE	I-58	20 - 68	463	27	20.53	NST	5a	0.117	-6
GM-26M	1,1-DCE	I-59	1.3 - 5.4	15.5	2.1	1.605	NST	5a	0.242	-4
GM-26M	1,1,1-TCA	I-60	0.54 - 8.8	15.5	1	3.724	NST	5a	0.242	-4
GM-26M	Perchlorate	I-61	130 - 362	158	160	115	DWN	5a	0.008	-10
GM-26M	TCE	I-62	20 - 68	463	27	20.53	NST	5a	0.117	-6
GM-26S	1,1-DCE	I-63	0.86 - 8.6	379	4.9	3.364	UP	5a	0.042	8
GM-26S	1,1,1-TCA	I-64	0.33 - 1.3	1230	1	0.445	NST	5a	0.408	2
GM-26S	Perchlorate	I-65	6.7 - 110	2560	98	49.55	NST	5a	0.117	6
GM-26S	TCE	I-66	15 - 150	4100	110	62.12	NST	5a	0.117	6
GM-30M	Perchlorate	I-67	1 - 14	15.5	6.3	5.531	NST	5a	0.408	2
GM-30M	TCE	I-68	0.7 - 9.3	15.7	3.95	3.87	NST	5a	0.375	-2
GM-32	TCE	I-69	7 - 25	158	13.5	7.762	UP	5a	0.042	6
MW-1	1,1-DCE	I-70	1 - 9340	463	754	1553	DWN	--	0.001	-656
MW-1	1,1,1-TCA	I-71	34 - 170000	4100	9900	29794	DWN	--	0.000	-1673
MW-1	1,2-DCA	I-72	0.5 - 2800	15.5	3	213.2	DWN	--	0.004	-562
MW-1	1,1,2-TCA	I-73	0.7 - 500	15.7	1	65.28	NST	--	0.122	-242
MW-1	Chlorobenzene	I-74	1 - 1000	158	4	157.5	NST	--	0.068	-319
MW-1	Chloroform	I-75	0.55 - 1300	4010	50.7	195.2	DWN	--	0.000	-997
MW-1	Dichloromethane	I-76	0.7 - 1200	7.3	5.4	210.8	NST	--	0.076	-309
MW-1	PCE	I-77	1 - 1100	4100	10.3	177.3	DWN	--	0.003	-604
MW-1	Perchlorate	I-78	180 - 26000	15.5	9135	7031	DWN	--	0.002	-163
MW-1	TCE	I-79	0.66 - 5000	15.5	155.5	603.2	DWN	--	0.000	-1240
MW-2	1,1-DCE	I-80	1 - 19000	15.7	1605	4112	DWN	--	0.000	-883
MW-2	1,1,1-TCA	I-81	43 - 201000	158	39450	46109	DWN	--	0.000	-1223
MW-2	1,2-DCA	I-82	0.5 - 2300	463	1	391.1	DWN	--	0.001	-616
MW-2	1,1,2-TCA	I-83	0.5 - 1000	4100	1	194.8	DWN	--	0.009	-505
MW-2	Benzene	I-84	0.5 - 1000	15.5	1	172	NST	--	0.145	-212

ARCADIS Design & Consultancy for natural and built assets

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			Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
MW-2	Chlorobenzene	I-85	1 - 1500	15.7	21.9	264.4	NST	--	0.333	-94
MW-2	Chloroform	I-86	0.5 - 3630	158	51.25	599.9	DWN	--	0.000	-1312
MW-2	Carbon Tetrachloride	I-87	0.5 - 43	4010	1	9.048	NST	--	0.142	-147
MW-2	Dichloromethane	I-88	0.7 - 2320	7.3	1.45	417.9	DWN	--	0.021	-415
MW-2	PCE	I-89	0.5 - 2200	15.5	6.8	367.6	DWN	--	0.003	-592
MW-2	Perchlorate	I-90	68 - 37400	15.5	977.5	8203	DWN	--	0.001	-176
MW-2	TCE	I-91	0.5 - 5000	158	108.5	647.6	DWN	--	0.000	-1578
MW-5	1,1-DCE	I-92	0.6 - 52.9	463	4.1	6.877	NST	--	0.120	262
MW-5	1,1,1-TCA	I-93	0.8 - 1000	15.5	3.9	117.5	DWN	--	0.000	-1219
MW-5	Chlorobenzene	I-94	0.5 - 420	15.5	1	56.91	NST	--	0.141	-208
MW-5	Chloroform	I-95	0.18 - 50	158	1	5.638	NST	--	0.336	79
MW-5	PCE	I-96	1 - 542	463	17.5	92.99	UP	--	0.000	1197
MW-5	Perchlorate	I-97	7.1 - 950	4100	253.5	242.2	DWN	--	0.012	-127
MW-5	TCE	I-98	1 - 2410	15.5	295	523	DWN	--	0.000	-1216
MW-10	1,1-DCE	I-99	1 - 600	15.7	13.5	92.58	DWN	--	0.000	-1200
MW-10	1,1,1-TCA	I-100	0.45 - 4770	158	38.85	810.3	DWN	--	0.000	-1583
MW-10	1,2-DCA	I-101	0.5 - 42	463	1	5.679	NST	--	0.478	-11
MW-10	Chlorobenzene	I-102	0.21 - 70.2	4100	1	9.059	DWN	--	0.000	-673
MW-10	Chloroform	I-103	0.14 - 19	15.5	1	3.702	DWN	--	0.000	-660
MW-10	Dichloromethane	I-104	0.7 - 6	15.7	1	1.032	NST	--	0.054	265
MW-10	PCE	I-105	0.5 - 11	158	1	1.536	DWN	--	0.000	-817
MW-10	Perchlorate	I-106	0.5 - 331	4010	101.9	88.52	UP	--	0.040	99
MW-10	TCE	I-107	0.5 - 1860	7.3	29	409.3	DWN	--	0.000	-1751
MW-12	1,1-DCE	I-108	1 - 17000	4100	221.5	2887	NST	--	0.444	31
MW-12	1,1,1-TCA	I-109	1 - 194000	15.5	2580	39100	DWN	--	0.007	-542
MW-12	1,2-DCA	I-110	0.5 - 32	15.5	1	3.819	NST	--	0.295	-105
MW-12	Chlorobenzene	I-111	0.5 - 1052	15.7	1	121.3	NST	--	0.365	-69
MW-12	Chloroform	I-112	0.5 - 1600	158	4.7	237.9	DWN	--	0.046	-364
MW-12	Dichloromethane	I-113	0.7 - 12.8	463	1	2.912	NST	--	0.122	224
MW-12	PCE	I-114	0.5 - 331	4100	4.6	43.68	NST	--	0.144	-230
MW-12	Perchlorate	I-115	190 - 15000	15.5	2625	3996	DWN	--	0.001	-169
MW-12	TCE	I-116	0.5 - 1652	15.7	41	238.8	DWN	--	0.029	-415
MW-12	VC	I-117	0.1 - 102	158	1	18.34	NST	--	0.065	285
MW-13	1,1-DCE	I-118	1 - 143	4010	11	1.271	NST	--	0.065	332
MW-13	1,1,1-TCA	I-119	0.77 - 1300	7.3	4	150.5	DWN	--	0.000	-1165
MW-13	1,2-DCA	I-120	0.4 - 30	15.5	1	4.207	NST	--	0.072	282
MW-13	Benzene	I-121	0.5 - 23	15.5	1	3.384	NST	--	0.436	31
MW-13	Chlorobenzene	I-122	0.7 - 2000	158	1.5	393.9	UP	--	0.042	367
MW-13	PCE	I-123	0.18 - 22	463	1.4	3.87	NST	--	0.133	-236
MW-13	Perchlorate	I-124	4.3 - 1600	15.5	680	456.3	DWN	--	0.001	-171
MW-13	TCE	I-125	0.96 - 1670	15.5	287	409.6	DWN	--	0.001	-643
MW-13	VC	I-126	0.1 - 20	158	1	3.342	NST	--	0.429	33

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MW-19	1,1-DCE	I-127	1 - 2300	463	34	361.8	DWN	--	0.000	-1233
MW-19	1,1,1-TCA	I-128	2 - 16100	4100	149	2740	DWN	--	0.000	-1993
MW-19	1,2-DCA	I-129	0.5 - 80	15.5	1	9.549	NST	--	0.129	-197
MW-19	1,1,2-TCA	I-130	0.5 - 100	15.7	1	11.79	NST	--	0.420	34
MW-19	Chloroform	I-131	0.48 - 60	158	1.3	14.05	DWN	--	0.000	-1209
MW-19	Dichloromethane	I-132	0.7 - 120	463	1	14.49	NST	--	0.268	-102
MW-19	PCE	I-133	0.65 - 220	4100	1	26.12	DWN	--	0.000	-695
MW-19	Perchlorate	I-134	20 - 6600	15.5	835	1231	DWN	--	0.027	-109
MW-19	TCE	I-135	0.5 - 500	15.7	51.33	127	DWN	--	0.000	-1613
MW-20	1,1-DCE	I-136	1 - 4930	158	44.5	730.1	DWN	--	0.000	-754
MW-20	1,1,1-TCA	I-137	7 - 29300	4010	511	5541	DWN	--	0.000	-1253
MW-20	1,2-DCA	I-138	0.5 - 49	7.3	1	7.51	DWN	--	0.046	-291
MW-20	1,1,2-TCA	I-139	0.5 - 50	4100	1	5.895	NST	--	0.324	-77
MW-20	Chlorobenzene	I-140	0.2 - 75	15.5	1	8.9	DWN	--	0.003	-466
MW-20	Chloroform	I-141	0.5 - 170	15.5	2	45.71	DWN	--	0.000	-709
MW-20	Dichloromethane	I-142	0.7 - 60	15.7	1	7.345	NST	--	0.232	128
MW-20	PCE	I-143	0.8 - 110	158	3.45	15.45	DWN	--	0.003	-525
MW-20	Perchlorate	I-144	9.1 - 10000	463	101	2184	NST	--	0.478	-4
MW-20	TCE	I-145	1 - 500	4100	12.15	115.6	DWN	--	0.000	-1134
MW-20	VC	I-146	0.5 - 100	15.5	1	14.14	UP	--	0.008	388
MW-22	1,1-DCE	I-147	0.14 - 68.2	15.7	2.67	10.4	UP	--	0.001	611
MW-22	1,1,1-TCA	I-148	0.8 - 382	158	25.3	68.28	NST	--	0.424	38
MW-22	PCE	I-149	0.23 - 170	4010	5.2	33.5	UP	--	0.000	918
MW-22	Perchlorate	I-150	0.5 - 1070	7.3	115	227.8	NST	--	0.072	-83
MW-22	TCE	I-151	1 - 930	15.5	99.4	192	DWN	--	0.000	-1016
MW-23	1,1-DCE	I-152	1 - 168	15.5	16.4	43.47	DWN	--	0.000	-782
MW-23	1,1,1-TCA	I-153	7.9 - 1600	158	197	422.4	DWN	--	0.000	-1061
MW-23	Chloroform	I-154	0.3 - 6	463	1	0.838	UP	--	0.027	316
MW-23	Perchlorate	I-155	0.5 - 380	15.5	42.3	94.71	DWN	--	0.000	-236
MW-23	TCE	I-156	0.5 - 205	15.5	6.7	51.58	DWN	--	0.000	-1817
MW-25	1,1-DCE	I-157	0.5 - 44.1	158	2.8	9.833	DWN	--	0.000	-1468
MW-25	1,1,1-TCA	I-158	0.44 - 420	463	18.5	103.5	DWN	--	0.000	-1749
MW-25	Chloroform	I-159	0.14 - 4.9	110	1	0.7	NST	--	0.058	-257
MW-25	PCE	I-160	1 - 4.4	38.5	1	0.633	DWN	--	0.000	-592
MW-25	Perchlorate	I-161	10 - 460	9.4	189.5	112.1	DWN	--	0.000	-250
MW-25	TCE	I-162	0.5 - 500	3990	4.6	61.3	DWN	--	0.000	-1709
MW-28	1,1-DCE	I-163	1.1 - 700	10.2	62	143.2	DWN	--	0.000	-2012
MW-28	1,1,1-TCA	I-164	14 - 7400	177	531	1001	DWN	--	0.000	-2138
MW-28	1,2-DCA	I-165	0.64 - 16	1100	1.1	2.847	DWN	--	0.000	-799
MW-28	1,1,2-TCA	I-166	0.28 - 20	209	1	3.176	NST	--	0.059	-259
MW-28	Chlorobenzene	I-167	0.63 - 30	1270	1	3.442	DWN	--	0.034	-300
MW-28	Chloroform	I-168	0.86 - 16	20.3	1.2	3.54	DWN	--	0.000	-721

ARCADIS Design & Consultancy for natural and built assets

TABLE J-1
Summary Statistics and Trend Results[1,2]
Alliant Techsystems Operations LLC
Elkton, Maryland
April 2019

Well ID	Analyte	Figure	Detected Results Summary [1]				Mann-Kendall Test [2]			
			Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
MW-28	Dichloromethane	I-169	128.1 - 0.7	1140	1	1081	NST	--	0.216	-144
MW-28	PCE	I-170	0.7 - 44	30.3	1.2	7.174	DWN	--	0.026	-375
MW-28	Perchlorate	I-171	150 - 5100	5	1750	1346	NST	--	0.102	-72
MW-28	TCE	I-172	1 - 500	10.2	69.7	73.75	DWN	--	0.000	-1313
MW-28	VC	I-173	0.1 - 40	177	1.5	7.134	NST	--	0.066	297
MW-29	1,1-DCE	I-174	1 - 1000	1100	33.3	159.9	DWN	--	0.000	-1312
MW-29	1,1,1-TCA	I-175	8 - 7020	209	162	1109	DWN	--	0.000	-2082
MW-29	1,2-DCA	I-176	0.5 - 11	1270	1	1.709	NST	--	0.120	195
MW-29	1,1,2-TCA	I-177	0.4 - 130	20.3	1	15.58	UP	--	0.045	256
MW-29	Chlorobenzene	I-178	0.4 - 15	1140	1	2.362	DWN	--	0.002	-424
MW-29	Chloroform	I-179	0.89 - 32	30.3	1	4.848	DWN	--	0.000	-633
MW-29	Dichloromethane	I-180	0.7 - 495	5	1	59.46	UP	--	0.030	294
MW-29	PCE	I-181	0.63 - 22	20.3	1	3.69	DWN	--	0.000	-726
MW-29	Perchlorate	I-182	1400 - 14000	1140	4100	3492	DWN	--	0.000	-220
MW-29	TCE	I-183	1 - 500	30.3	33.4	99.72	DWN	--	0.000	-1478
MW-29	VC	I-184	1 - 2.8	5	1	0.352	UP	--	0.010	243

Abbreviations:

-- insufficient data for calculating statistics (n < 4) or not available
FOD = frequency of detection (# detects / # samples)
mean = arithmetic mean
SD = standard deviation
NST = no significant trend
DWN = downward trend
UP = upward trend

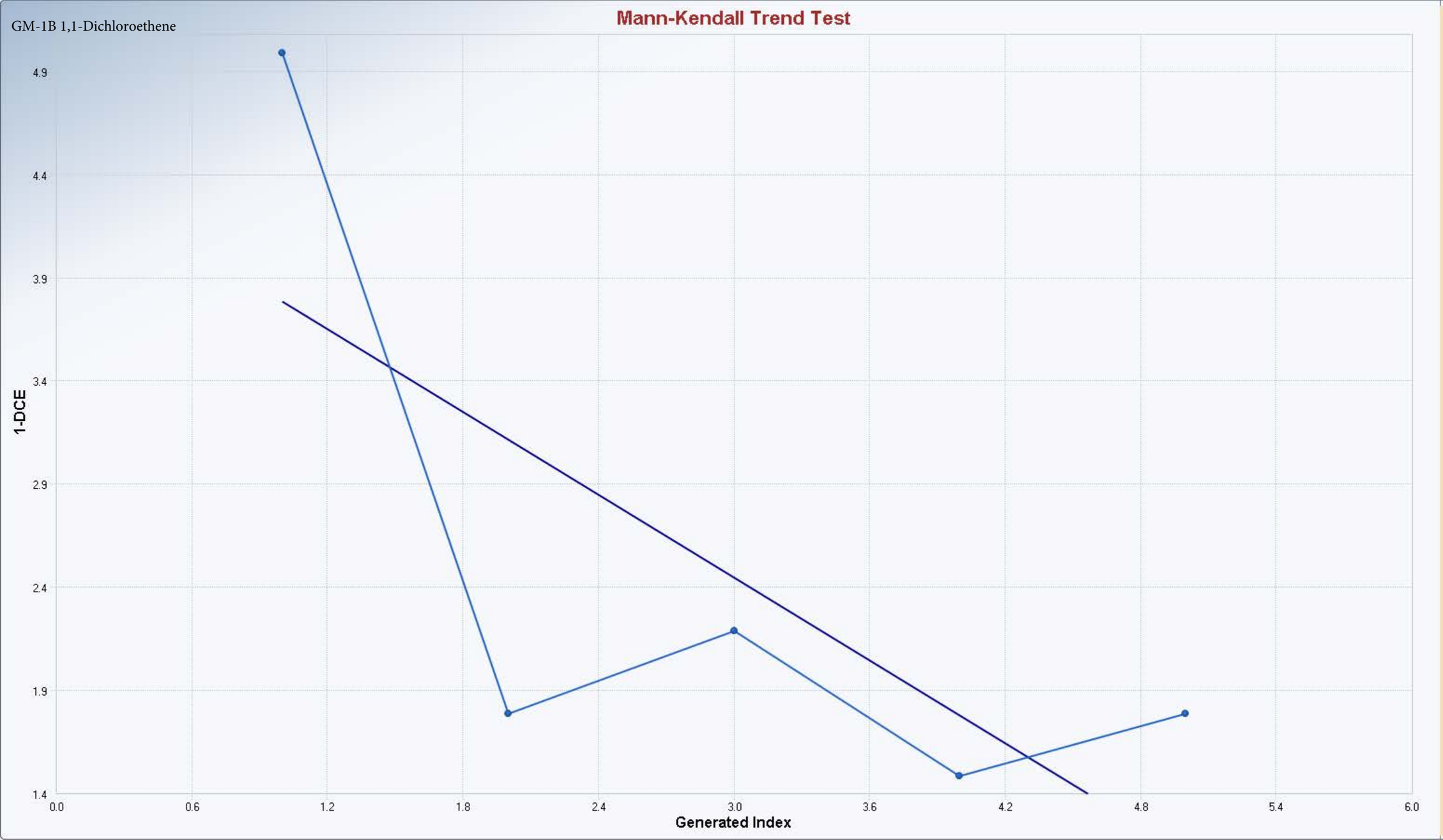
Notes:

1. All analytical results are in µg/L. Result values less than 10 are reported to 2 significant figures; values greater than 10 are reported to 3 significant figures. P-values are reported to 3 decimal places.
2. Trend results are presented when at least four samples and one detected value are available. Significance of trends evaluated at 95% confidence (alpha = 0.05).
3. Non-detects were assigned a common value less than the minimum detected value, equal to half the minimum reporting limit (RL) in the dataset (USEPA, 2009). If half the minimum RL was greater than the minimum detected value, then half the minimum detect was assigned.
4. Statistically significant trend defined as having p-value ≤ 0.05, or 95% confidence.
5a. MK Trend results for datasets with fewer than 8 samples should be treated with caution.
5b. MK Trend results for datasets with an FOD <=20% should be treated with caution.
5c. MK results for datasets with more than 100 samples are not shown.

Reference:

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA/530/R-09/007, 2009.

GM-1B 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	3.9581
Standardized Value of S	-1.0106
M-K Test Value (S)	-5
Tabulated p-value	0.2420
Approximate p-value	0.1561

OLS Regression Line (Blue)

OLS Regression Slope	-0.6700
OLS Regression Intercept	4.4700

Insufficient statistical evidence of a significant trend at the specified level of significance.

1,1-DCE	Mann-Kendall Trend Test Analysis	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:18:19 AM	
From File	GM-1B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

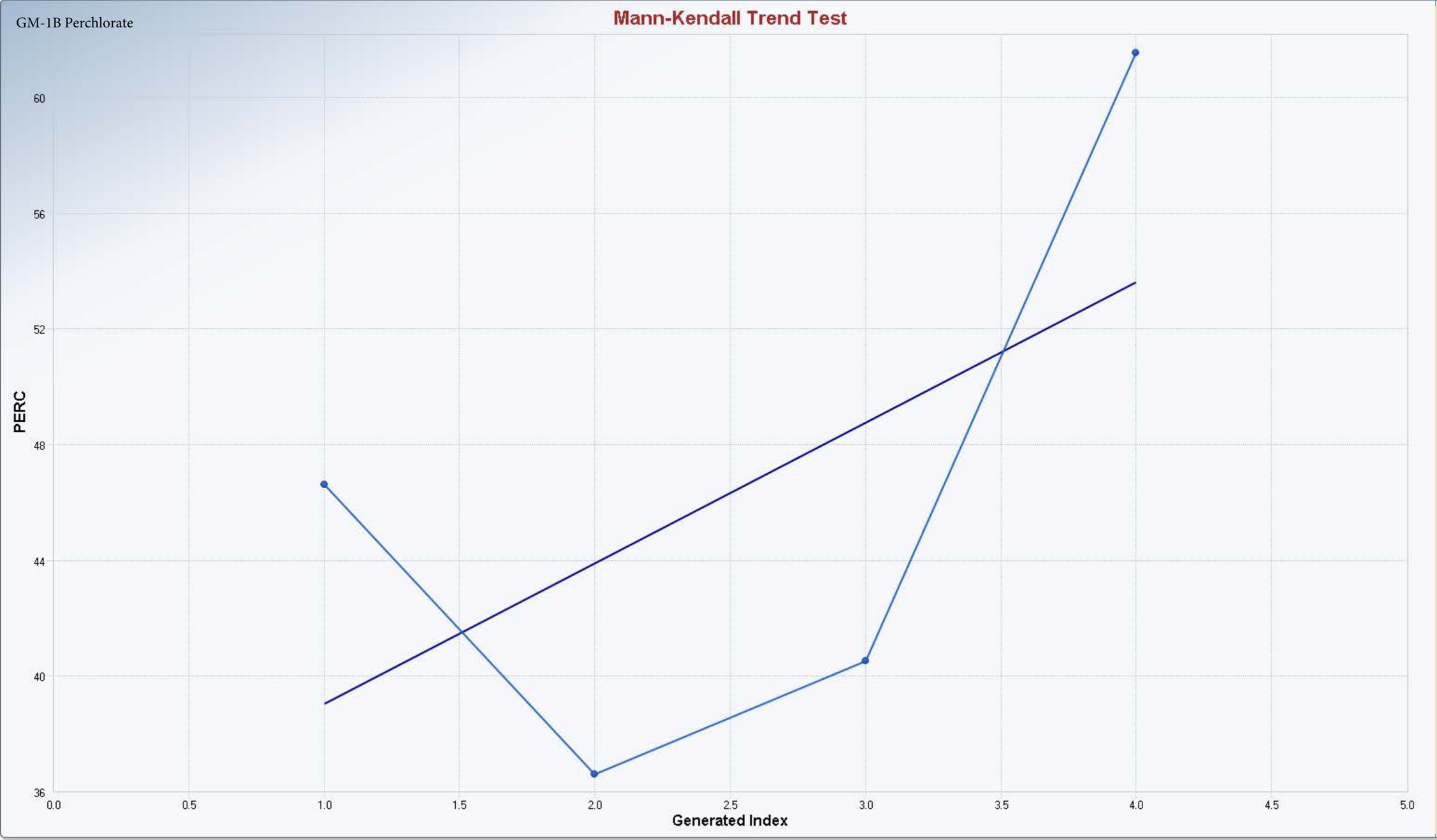
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	6
Number Values Missing	1
Number Values Used	5
Minimum	1.5
Maximum	5
Mean	2.46
Geometric Mean	2.216
Median	1.8
Standard Deviation	1.442
Coefficient of Variation	0.586

Mann-Kendall Test

M-K Test Value (S)	-5
Tabulated p-value	0.242
Standard Deviation of S	3.958
Standardized Value of S	-1.011
Approximate p-value	0.156

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-1B Perchlorate



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	0.3397
M-K Test Value (S)	2
Tabulated p-value	0.3750
Approximate p-value	0.3670

OLS Regression Line (Blue)

OLS Regression Slope	4.8600
OLS Regression Intercept	34.6500

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-1B Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 9:52:36 AM	
From File	GM-1B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

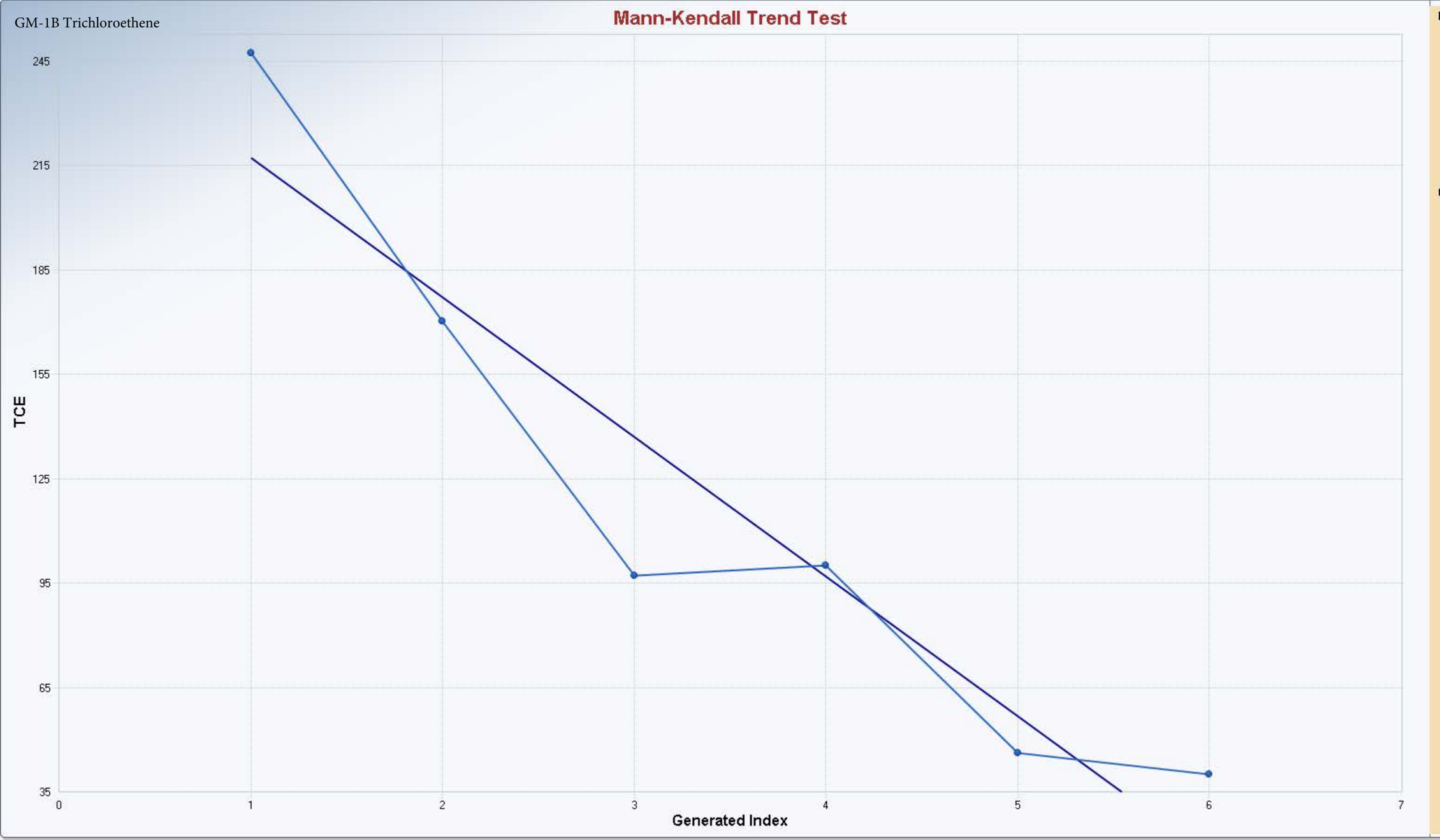
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	6
Number Values Missing	2
Number Values Used	4
Minimum	37.1
Maximum	62
Mean	46.8
Geometric Mean	45.91
Median	44.05
Standard Deviation	10.94
Coefficient of Variation	0.234

Mann-Kendall Test

M-K Test Value (S)	2
Tabulated p-value	0.375
Standard Deviation of S	2.944
Standardized Value of S	0.34
Approximate p-value	0.367

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-1B Trichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-2.2544
M-K Test Value (S)	-13
Tabulated p-value	0.0080
Approximate p-value	0.0121

OLS Regression Line (Blue)

OLS Regression Slope	-40.1143
OLS Regression Intercept	257.0667

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-1B TCE	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:20:20 AM	
From File	GM-1B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

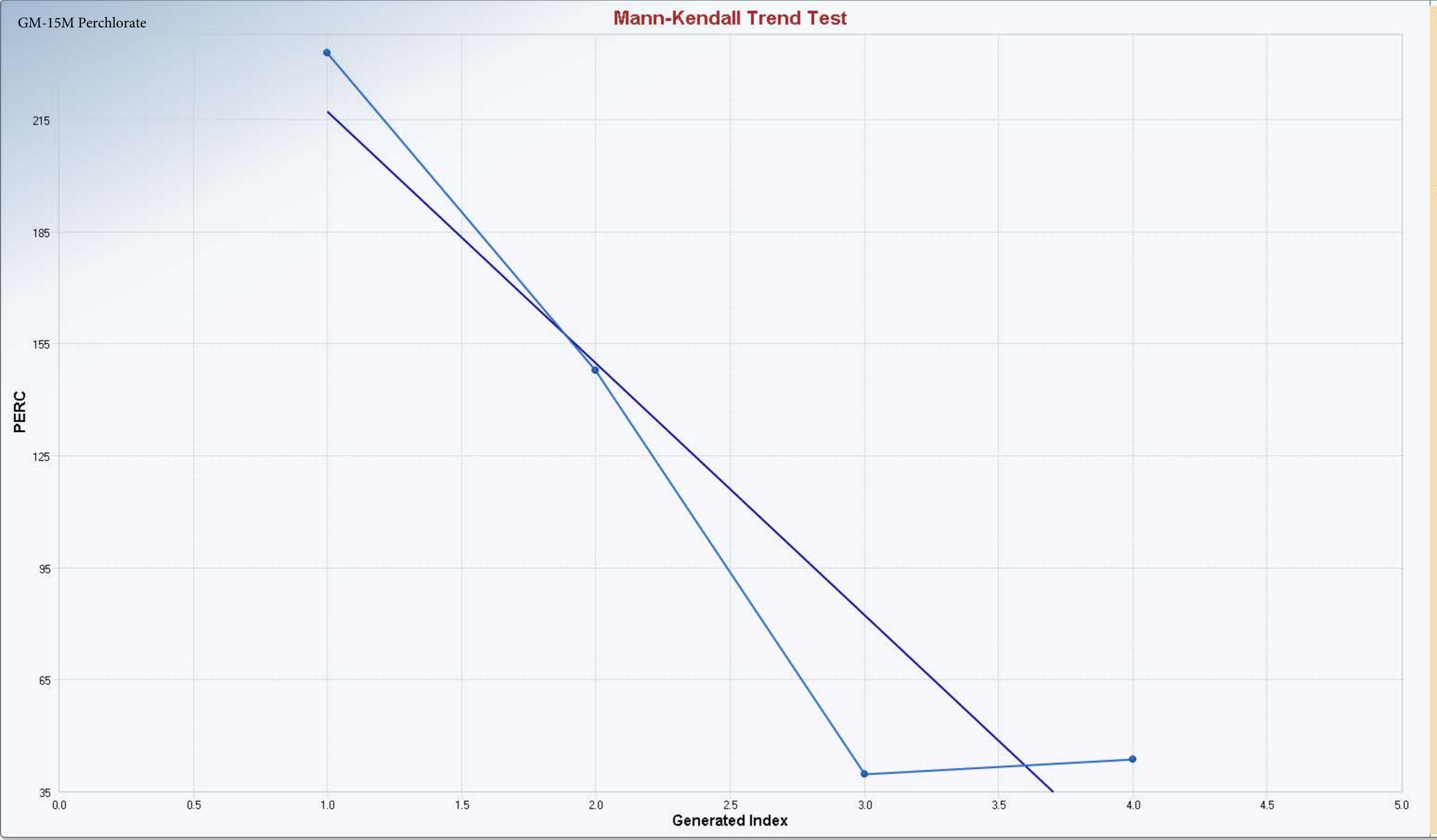
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	40
Maximum	247
Mean	116.7
Geometric Mean	95.31
Median	98.5
Standard Deviation	79.21
Coefficient of Variation	0.679

Mann-Kendall Test

M-K Test Value (S)	-13
Tabulated p-value	0.008
Standard Deviation of S	5.323
Standardized Value of S	-2.254
Approximate p-value	0.0121

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-15M Perchlorate



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-67.5000
OLS Regression Intercept	285.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-15M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:55:26 AM	
From File	GM-15M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

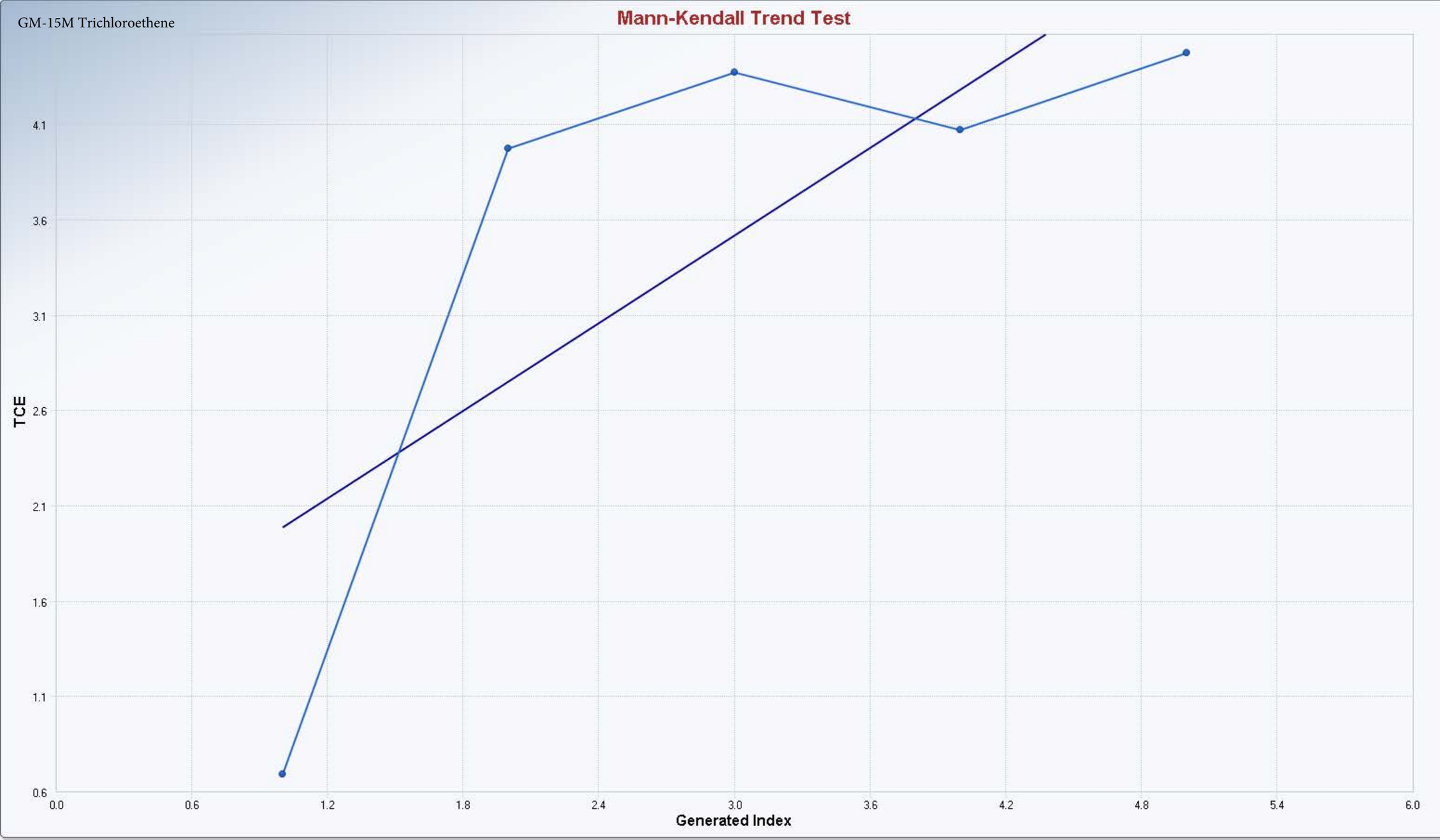
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	40
Maximum	233
Mean	116.3
Geometric Mean	88.26
Median	96
Standard Deviation	92.51
Coefficient of Variation	0.796

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-15M Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	1.7146
M-K Test Value (S)	8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	0.7660
OLS Regression Intercept	1.2460

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-15M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:58:17 AM	
From File	GM-15M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	0.72
Maximum	4.5
Mean	3.544
Geometric Mean	2.977
Median	4.1
Standard Deviation	1.592
Coefficient of Variation	0.449

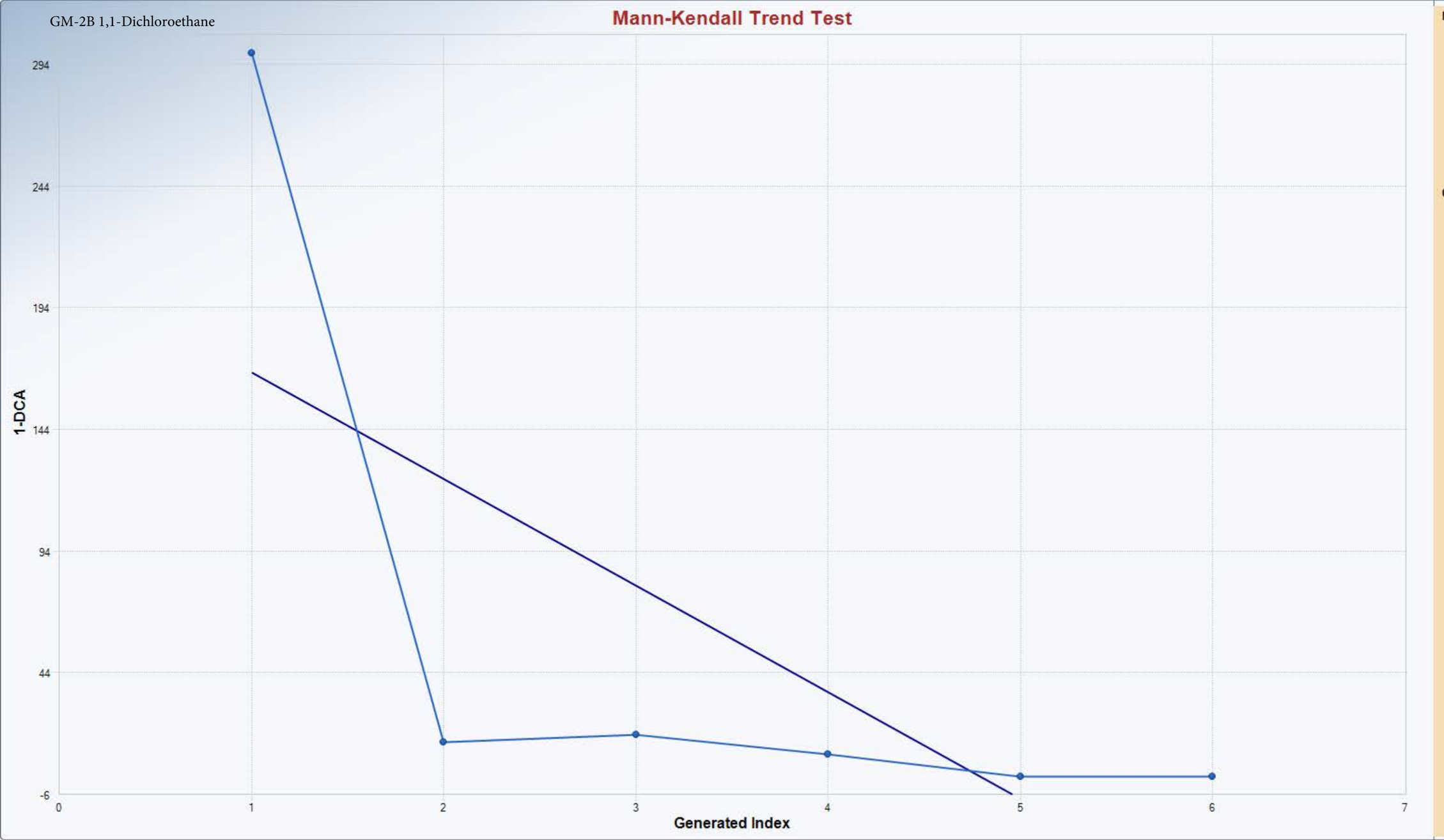
Mann-Kendall Test

M-K Test Value (S)	8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	1.715
Approximate p-value	0.0432

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-2B 1,1-Dichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-2.1040
M-K Test Value (S)	-12
Tabulated p-value	0.0080
Approximate p-value	0.0177

OLS Regression Line (Blue)

OLS Regression Slope	-43.8571
OLS Regression Intercept	210.6667

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-2B 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/6/2019 1:52:19 PM	
From File	GM-2B_a.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

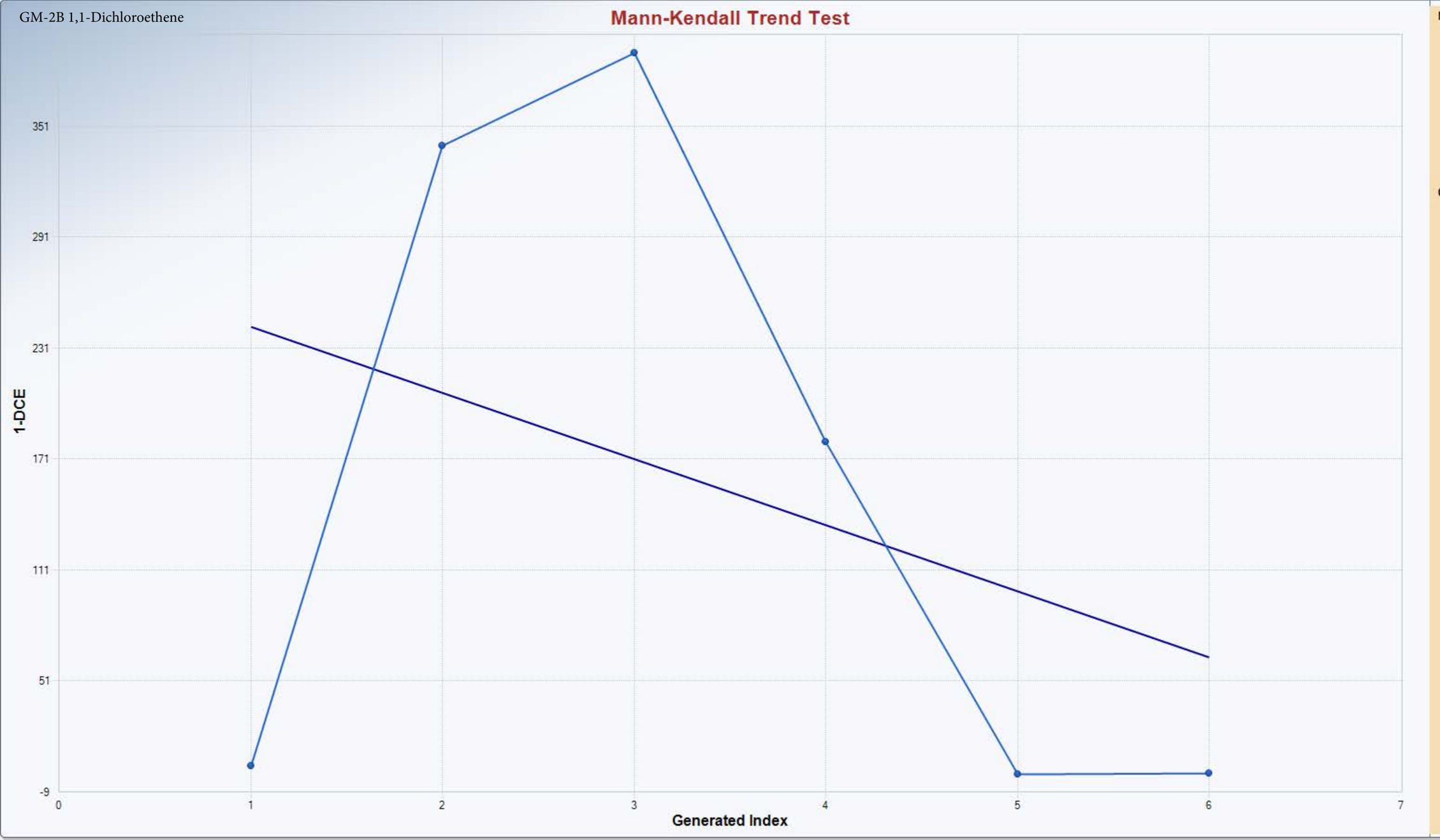
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	7
Number Values Missing	1
Number Values Used	6
Minimum	1
Maximum	298
Mean	57.17
Geometric Mean	9.644
Median	12.5
Standard Deviation	118.2
Coefficient of Variation	2.067

Mann-Kendall Test

M-K Test Value (S)	-12
Tabulated p-value	0.008
Standard Deviation of S	5.228
Standardized Value of S	-2.104
Approximate p-value	0.0177

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-2B 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-0.7515
M-K Test Value (S)	-5
Tabulated p-value	0.2350
Approximate p-value	0.2262

OLS Regression Line (Blue)

OLS Regression Slope	-35.6714
OLS Regression Intercept	277.6000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-2B 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/6/2019 1:54:04 PM	
From File	GM-2B_a.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

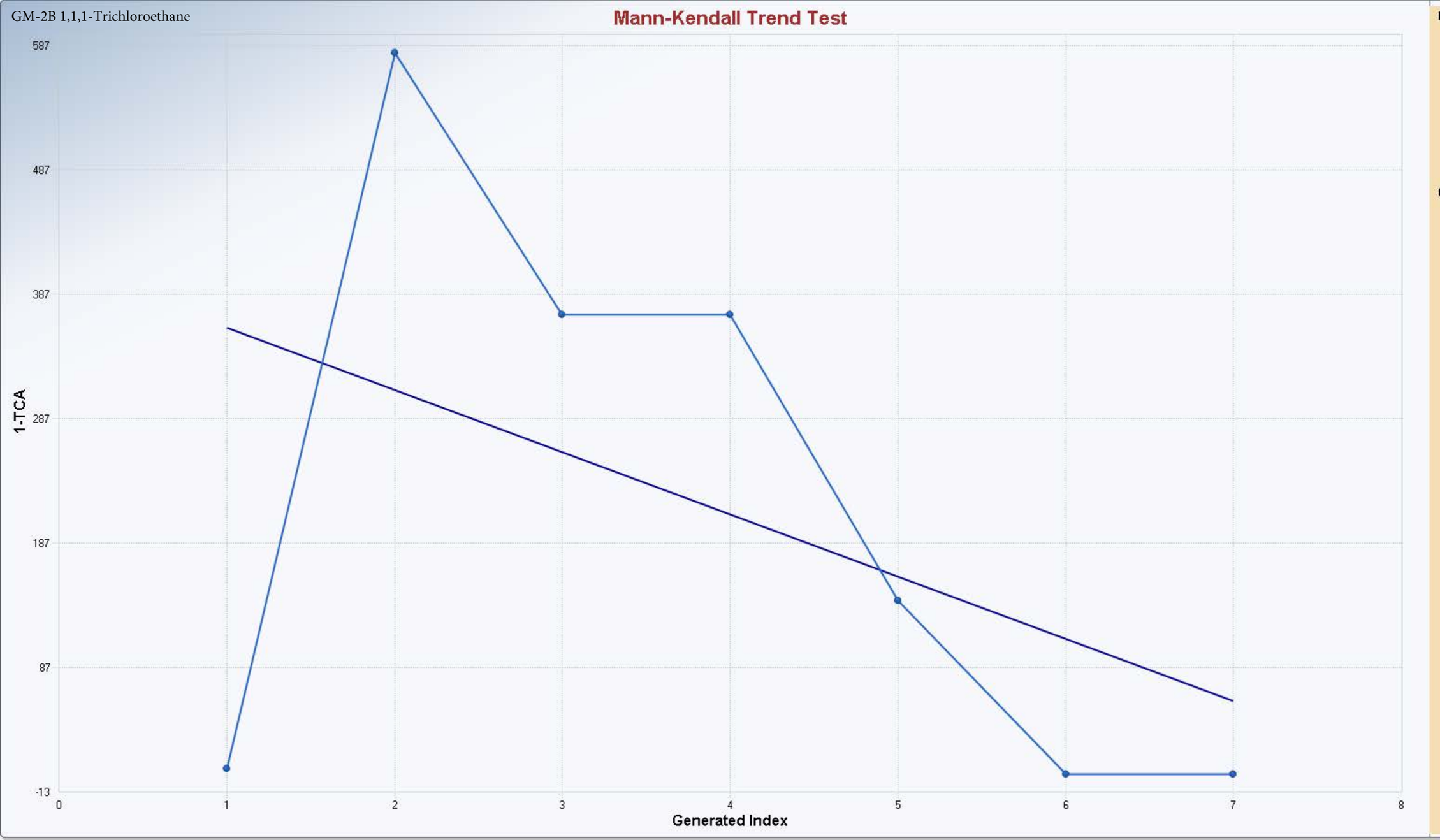
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	7
Number Values Missing	1
Number Values Used	6
Minimum	0.5
Maximum	390
Mean	152.8
Geometric Mean	19.77
Median	92.5
Standard Deviation	179
Coefficient of Variation	1.172

Mann-Kendall Test

M-K Test Value (S)	-5
Tabulated p-value	0.235
Standard Deviation of S	5.323
Standardized Value of S	-0.751
Approximate p-value	0.226

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-2B 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.5064
Standardized Value of S	-1.5369
M-K Test Value (S)	-11
Tabulated p-value	0.0680
Approximate p-value	0.0622

OLS Regression Line (Blue)

OLS Regression Slope	-50.0000
OLS Regression Intercept	409.5714

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-2B 1,1,1-TCA	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:26:33 AM	
From File	GM-2B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

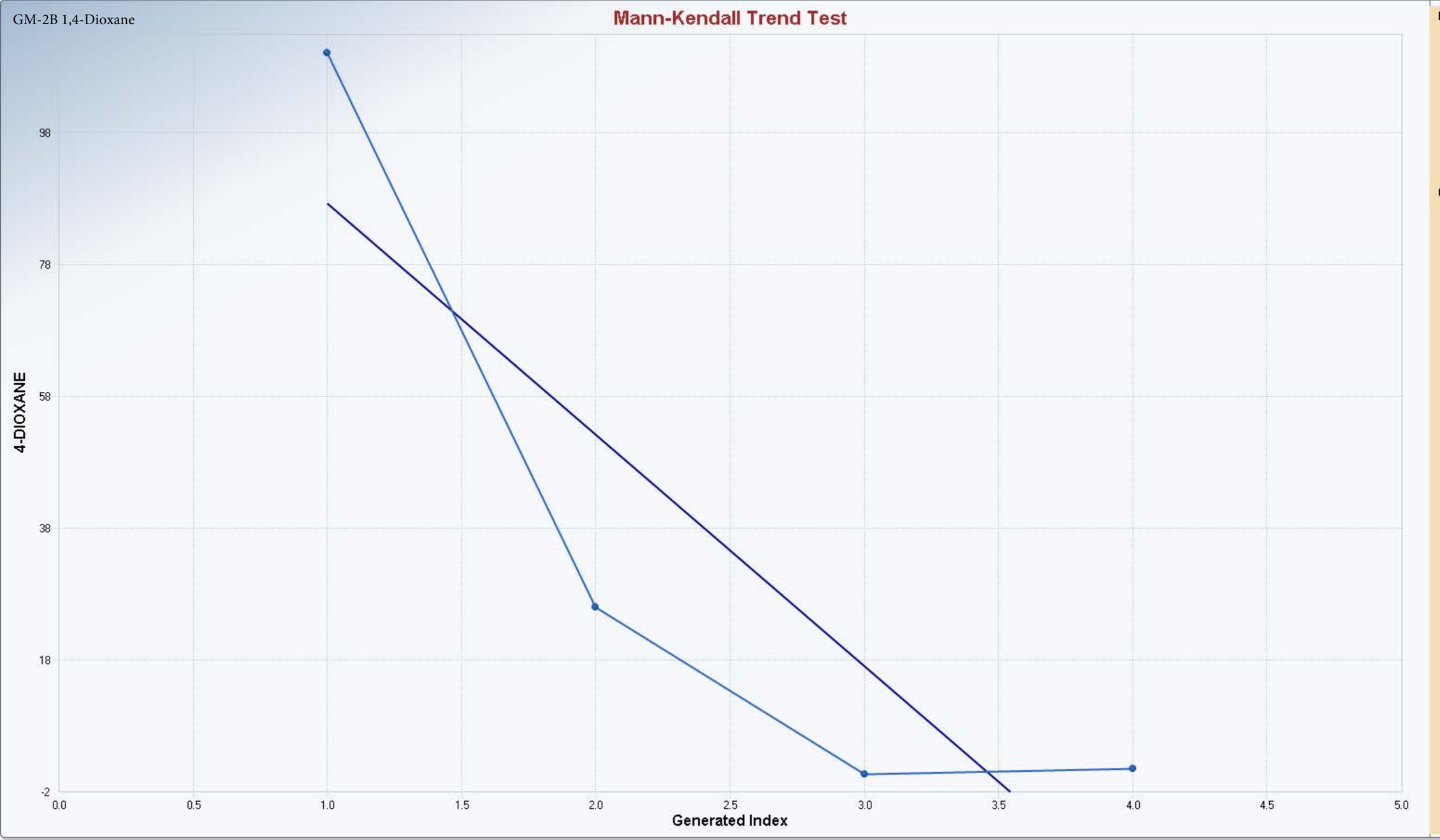
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	7
Minimum	1
Maximum	580
Mean	209.6
Geometric Mean	34.28
Median	140
Standard Deviation	231.8
Coefficient of Variation	1.106

Mann-Kendall Test

M-K Test Value (S)	-11
Tabulated p-value	0.068
Standard Deviation of S	6.506
Standardized Value of S	-1.537
Approximate p-value	0.0622

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-2B 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-35.1130
OLS Regression Intercept	122.3000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-2B 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:24:21 AM	
From File	GM-2B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

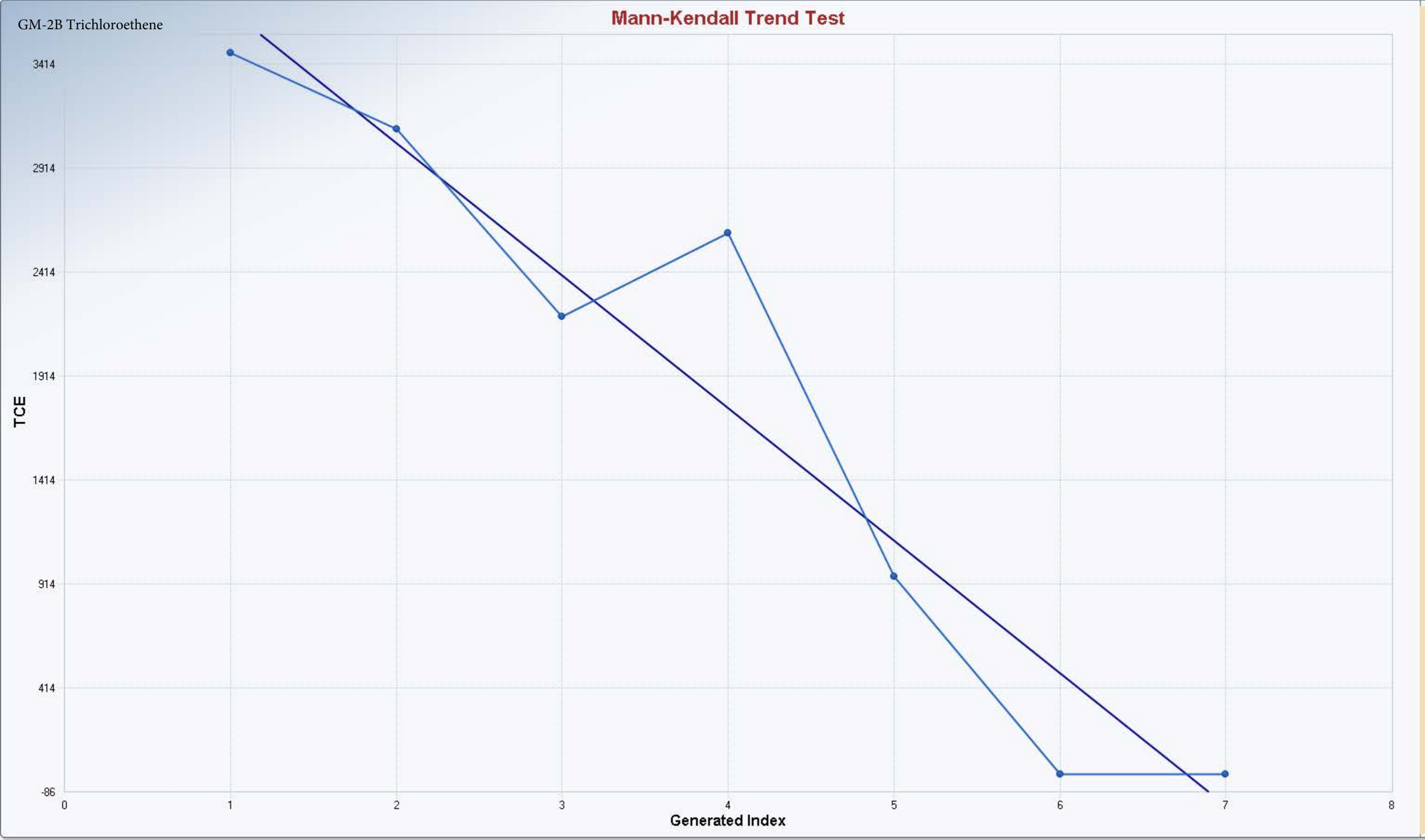
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	7
Number Values Missing	3
Number Values Used	4
Minimum	0.67
Maximum	110
Mean	34.52
Geometric Mean	7.197
Median	13.7
Standard Deviation	51.68
Coefficient of Variation	1.497

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-2B Trichloroethene



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.5828
Standardized Value of S	-2.5825
M-K Test Value (S)	-18
Tabulated p-value	0.0010
Approximate p-value	0.0049

OLS Regression Line (Blue)

OLS Regression Slope	-637.1429
OLS Regression Intercept	4,308.1429

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-2B TCE	**Mann-Kendall Trend Test Analysis**
User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2019 10:36:12 AM
From File	GM-2B_a.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

TCE

General Statistics

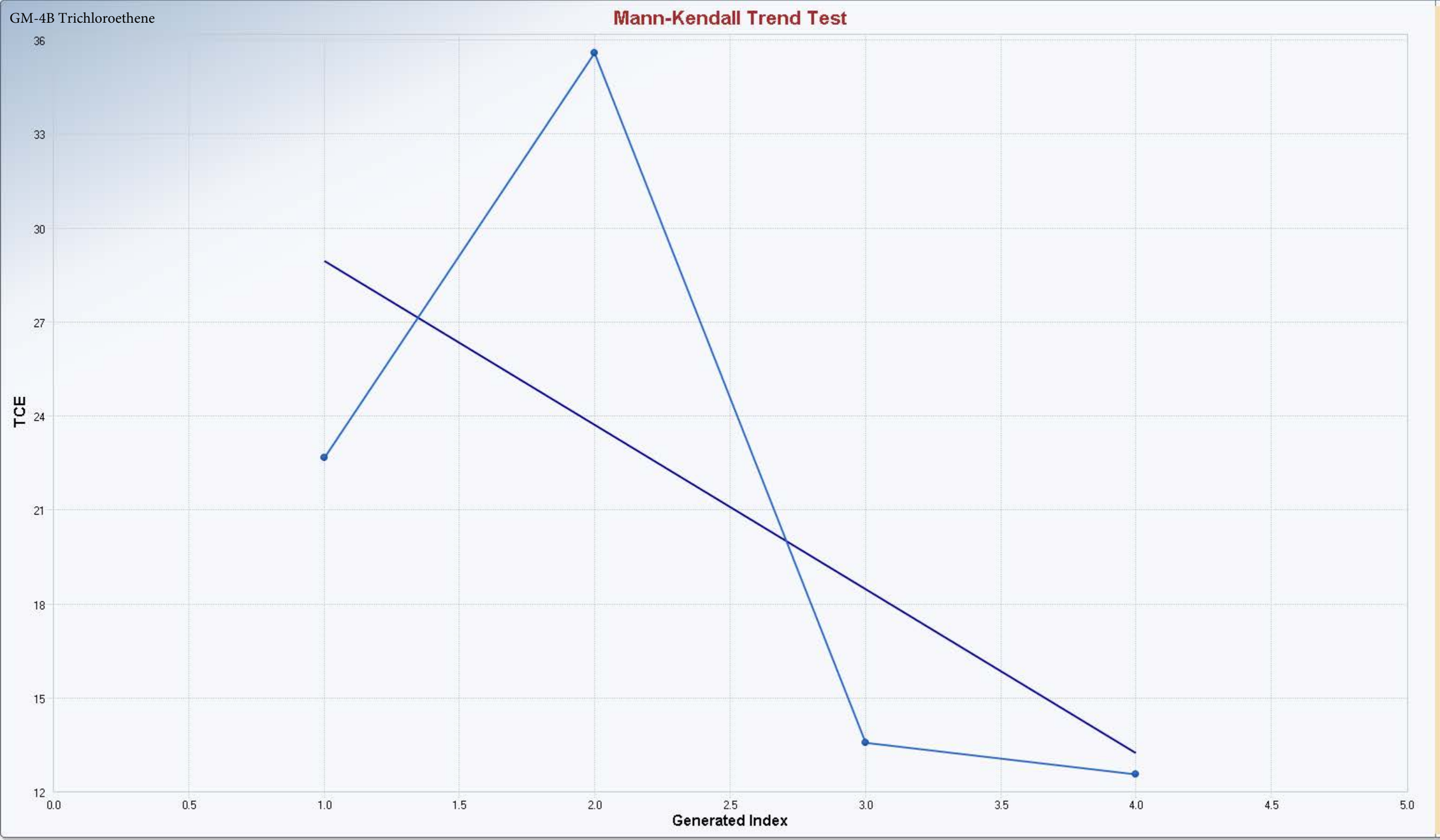
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	7
Minimum	1
Maximum	3465
Mean	1760
Geometric Mean	248.4
Median	2200
Standard Deviation	1440
Coefficient of Variation	0.819

Mann-Kendall Test

M-K Test Value (S)	-18
Tabulated p-value	0.001
Standard Deviation of S	6.583
Standardized Value of S	-2.582
Approximate p-value	0.0049

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-4B Trichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-5.2300
OLS Regression Intercept	34.6000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-4B TCE	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:38:52 AM	
From File	GM4B.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

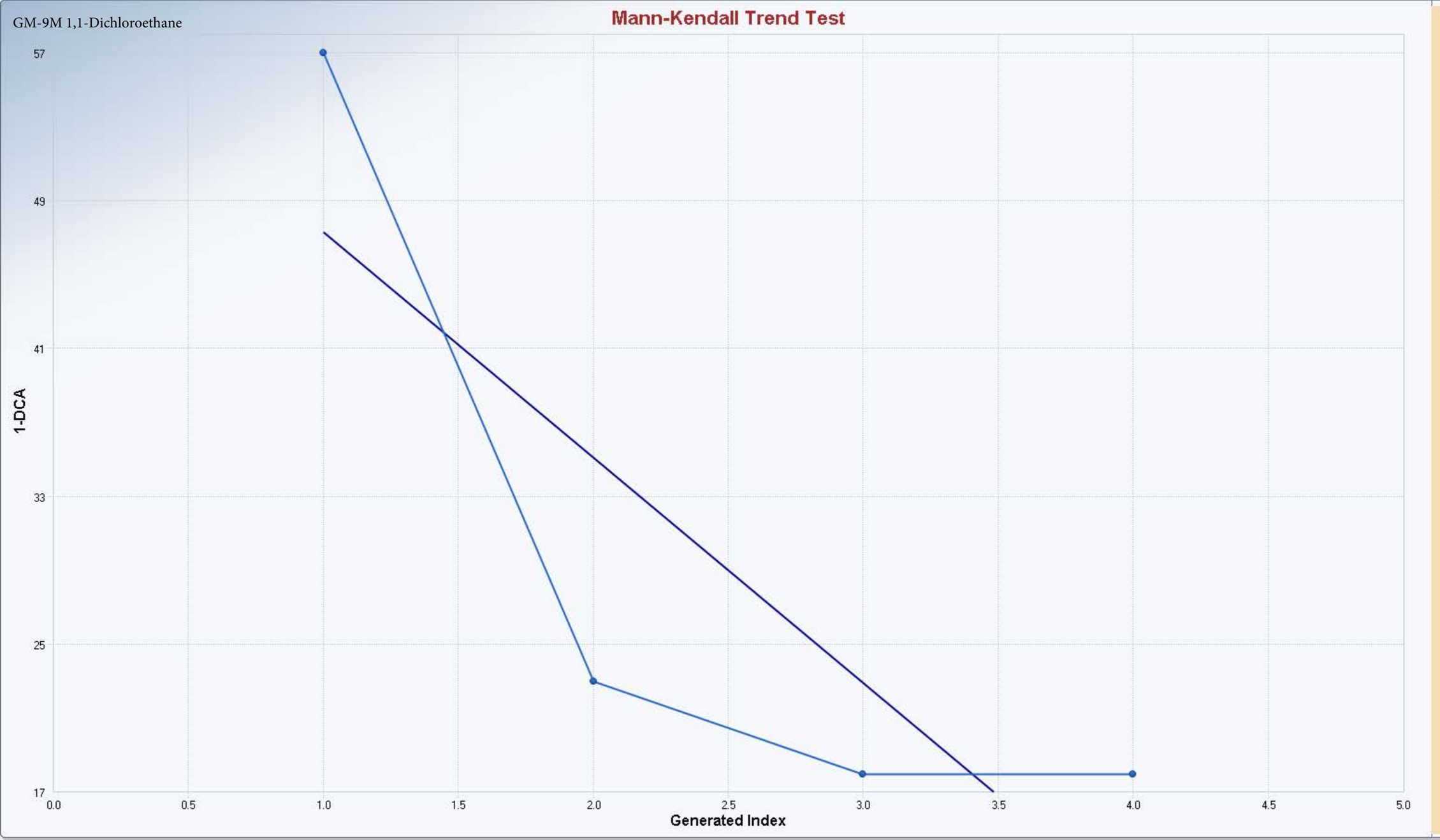
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	13
Maximum	36
Mean	21.53
Geometric Mean	19.72
Median	18.55
Standard Deviation	10.67
Coefficient of Variation	0.496

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-9M 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.7689
Standardized Value of S	-1.4446
M-K Test Value (S)	-5
Tabulated p-value	0.1670
Approximate p-value	0.0743

OLS Regression Line (Blue)

OLS Regression Slope	-12.2000
OLS Regression Intercept	59.5000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-9M 1,1-DCA	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:44:02 AM	
From File	GM-9M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

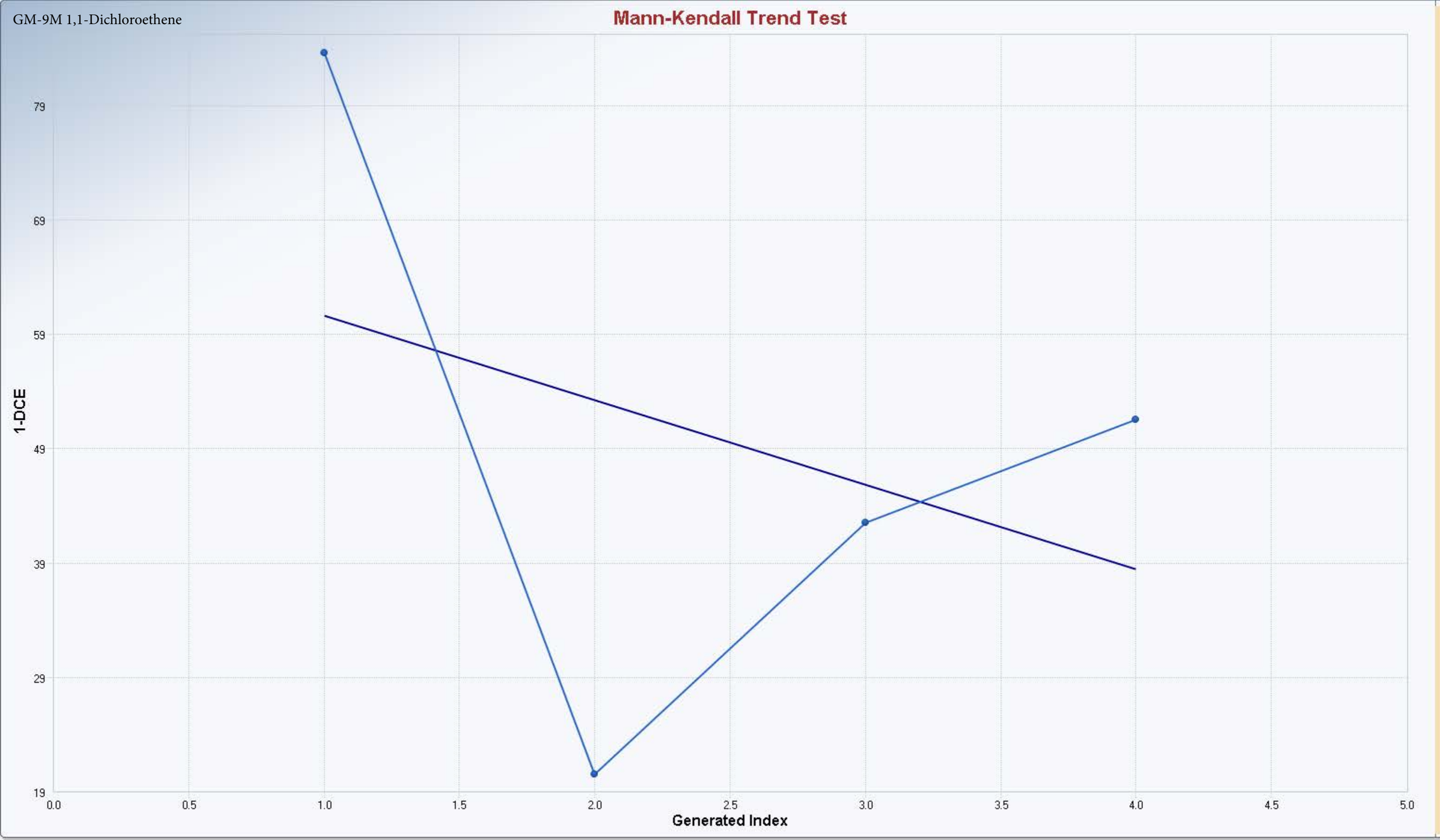
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	18
Maximum	57
Mean	29
Geometric Mean	25.53
Median	20.5
Standard Deviation	18.81
Coefficient of Variation	0.649

Mann-Kendall Test

M-K Test Value (S)	-5
Tabulated p-value	0.167
Standard Deviation of S	2.769
Standardized Value of S	-1.445
Approximate p-value	0.0743

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-9M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	
M-K Test Value (S)	0
Tabulated p-value	0.6250
Approximate p-value	

OLS Regression Line (Blue)

OLS Regression Slope	-7.4000
OLS Regression Intercept	68.5000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-9M 1,1-DCE	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:45:08 AM	
From File	GM-9M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

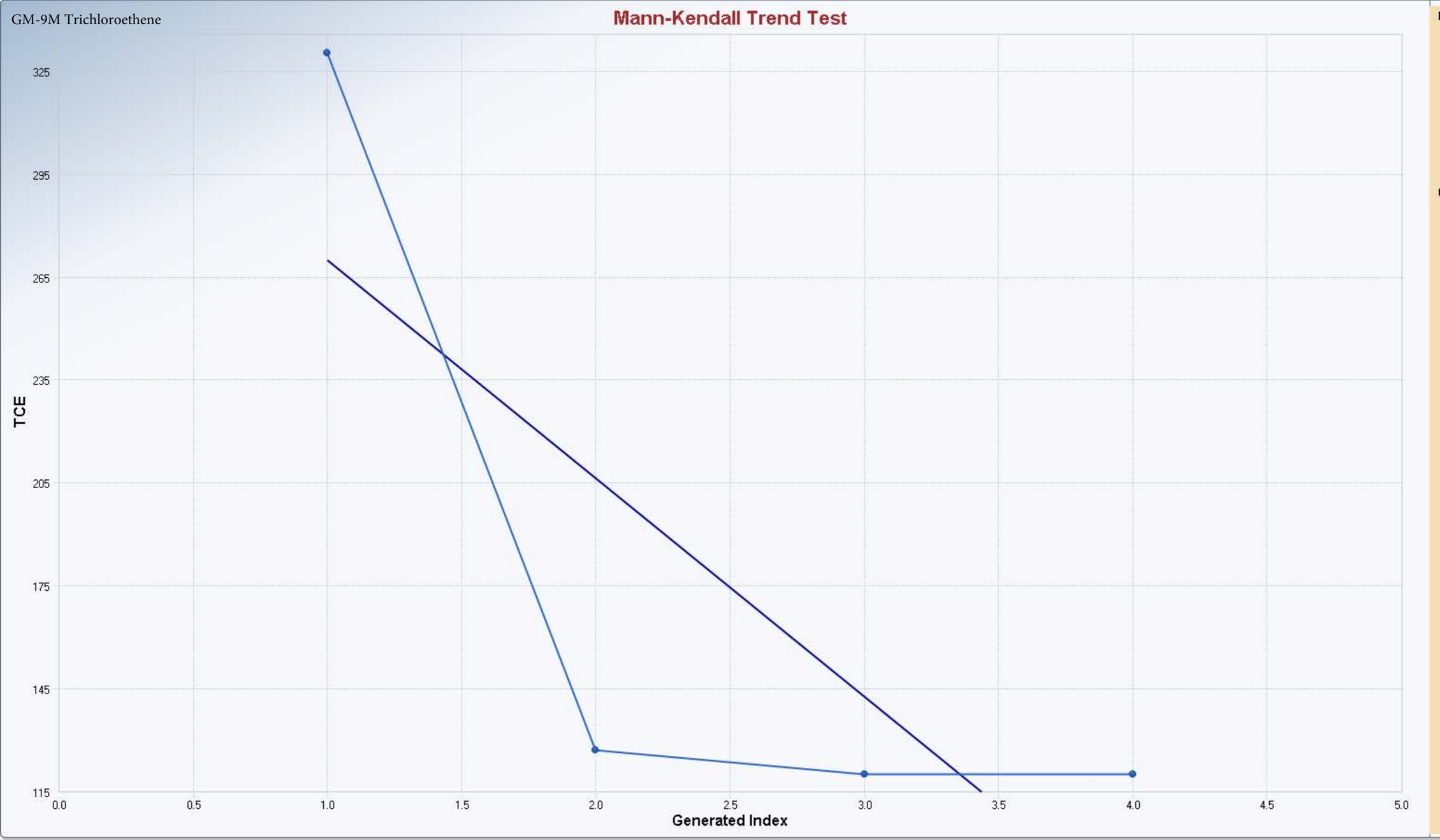
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	21
Maximum	84
Mean	50
Geometric Mean	44.56
Median	47.5
Standard Deviation	26.14
Coefficient of Variation	0.523

Mann-Kendall Test

M-K Test Value (S)	0
Tabulated p-value	0.625
Standard Deviation of S	2.944
Standardized Value of S	N/A
Approximate p-value	N/A

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-9M Trichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.7689
Standardized Value of S	-1.4446
M-K Test Value (S)	-5
Tabulated p-value	0.1670
Approximate p-value	0.0743

OLS Regression Line (Blue)

OLS Regression Slope	-63.7000
OLS Regression Intercept	333.5000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-9M TCE	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.15/31/2019 10:46:12 AM	
From File	GM-9M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

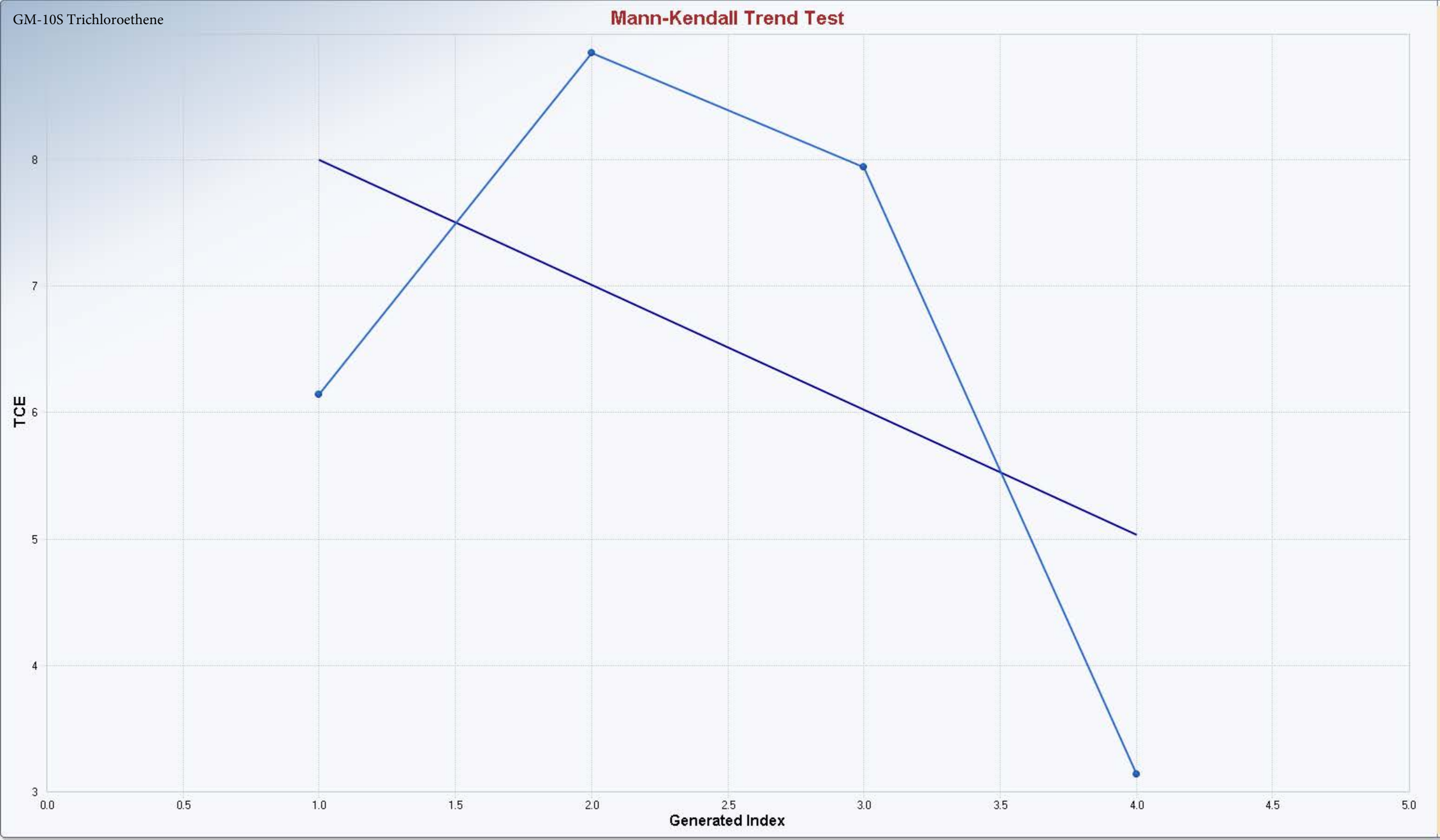
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	120
Maximum	330
Mean	174.3
Geometric Mean	156.7
Median	123.5
Standard Deviation	103.9
Coefficient of Variation	0.596

Mann-Kendall Test

M-K Test Value (S)	-5
Tabulated p-value	0.167
Standard Deviation of S	2.769
Standardized Value of S	-1.445
Approximate p-value	0.0743

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-10S Trichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-0.3397
M-K Test Value (S)	-2
Tabulated p-value	0.3750
Approximate p-value	0.3670

OLS Regression Line (Blue)

OLS Regression Slope	-0.9900
OLS Regression Intercept	8.8500

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-10S TCE	**Mann-Kendall Trend Test Analysis**
User Selected Options	
Date/Time of Computation	ProUCL 5.15/31/2019 10:47:24 AM
From File	GM-10S.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

TCE

General Statistics

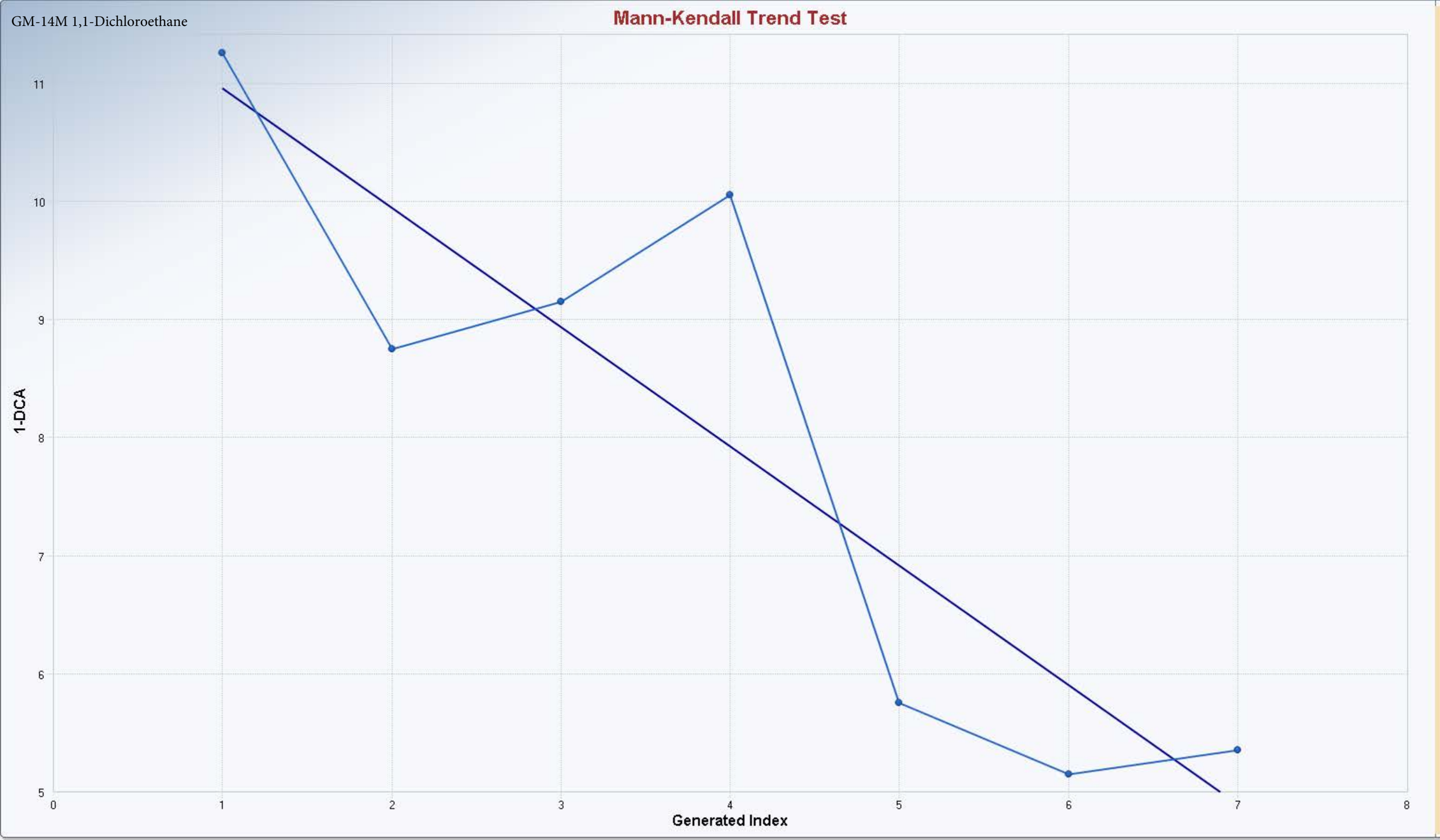
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	3
Maximum	8.7
Mean	6.375
Geometric Mean	5.912
Median	6.9
Standard Deviation	2.514
Coefficient of Variation	0.394

Mann-Kendall Test

M-K Test Value (S)	-2
Tabulated p-value	0.375
Standard Deviation of S	2.944
Standardized Value of S	-0.34
Approximate p-value	0.367

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-14M 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.6583
Standardized Value of S	-1.8023
M-K Test Value (S)	-13
Tabulated p-value	0.0350
Approximate p-value	0.0358

OLS Regression Line (Blue)

OLS Regression Slope	-1.0107
OLS Regression Intercept	11.7143

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:10:06 AM	
From File	GM-14M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

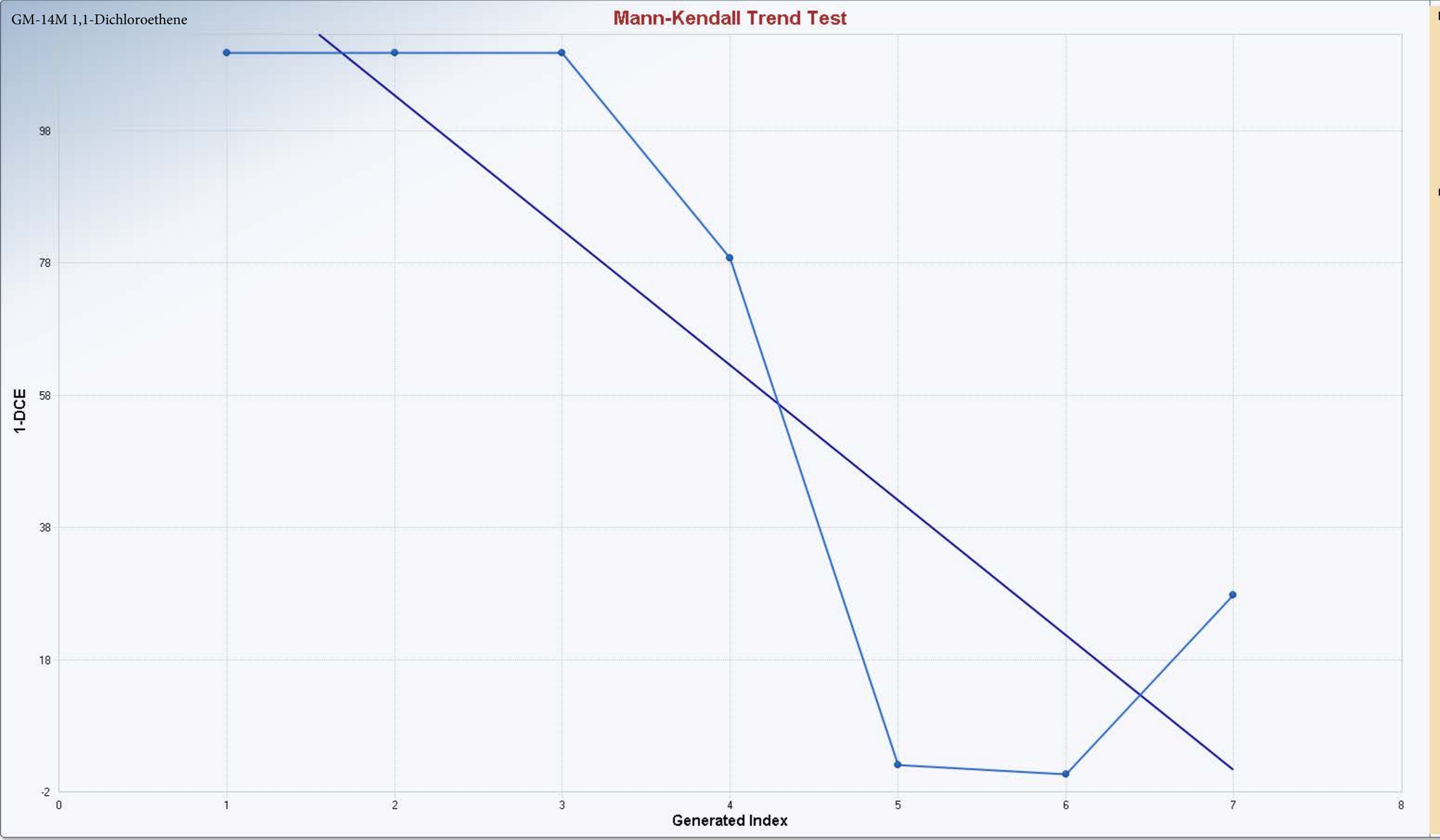
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	8
Number Values Missing	1
Number Values Used	7
Minimum	4.9
Maximum	11
Mean	7.671
Geometric Mean	7.315
Median	8.5
Standard Deviation	2.477
Coefficient of Variation	0.323

Mann-Kendall Test

M-K Test Value (S)	-13
Tabulated p-value	0.035
Standard Deviation of S	6.658
Standardized Value of S	-1.802
Approximate p-value	0.0358

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.3770
Standardized Value of S	-2.0386
M-K Test Value (S)	-14
Tabulated p-value	0.0150
Approximate p-value	0.0207

OLS Regression Line (Blue)

OLS Regression Slope	-20.4179
OLS Regression Intercept	144.5714

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:15:10 AM	
From File	GM-14M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

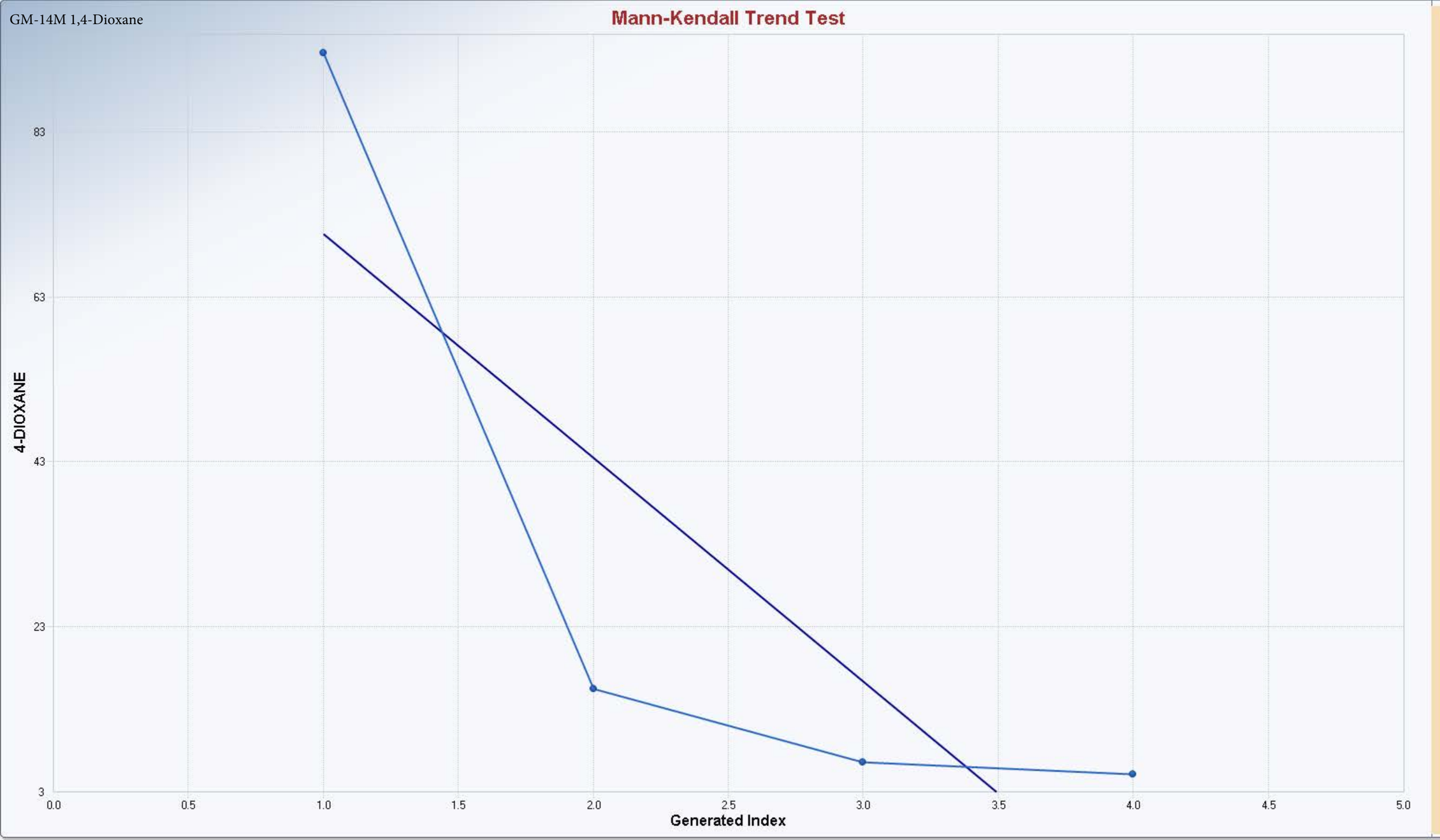
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	8
Number Values Missing	1
Number Values Used	7
Minimum	1
Maximum	110
Mean	62.9
Geometric Mean	25.37
Median	79
Standard Deviation	51.05
Coefficient of Variation	0.812

Mann-Kendall Test

M-K Test Value (S)	-14
Tabulated p-value	0.015
Standard Deviation of S	6.377
Standardized Value of S	-2.039
Approximate p-value	0.0207

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.6984
M-K Test Value (S)	-6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)

OLS Regression Slope	-27.0800
OLS Regression Intercept	97.1500

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:05:39 AM	
From File	GM-14M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

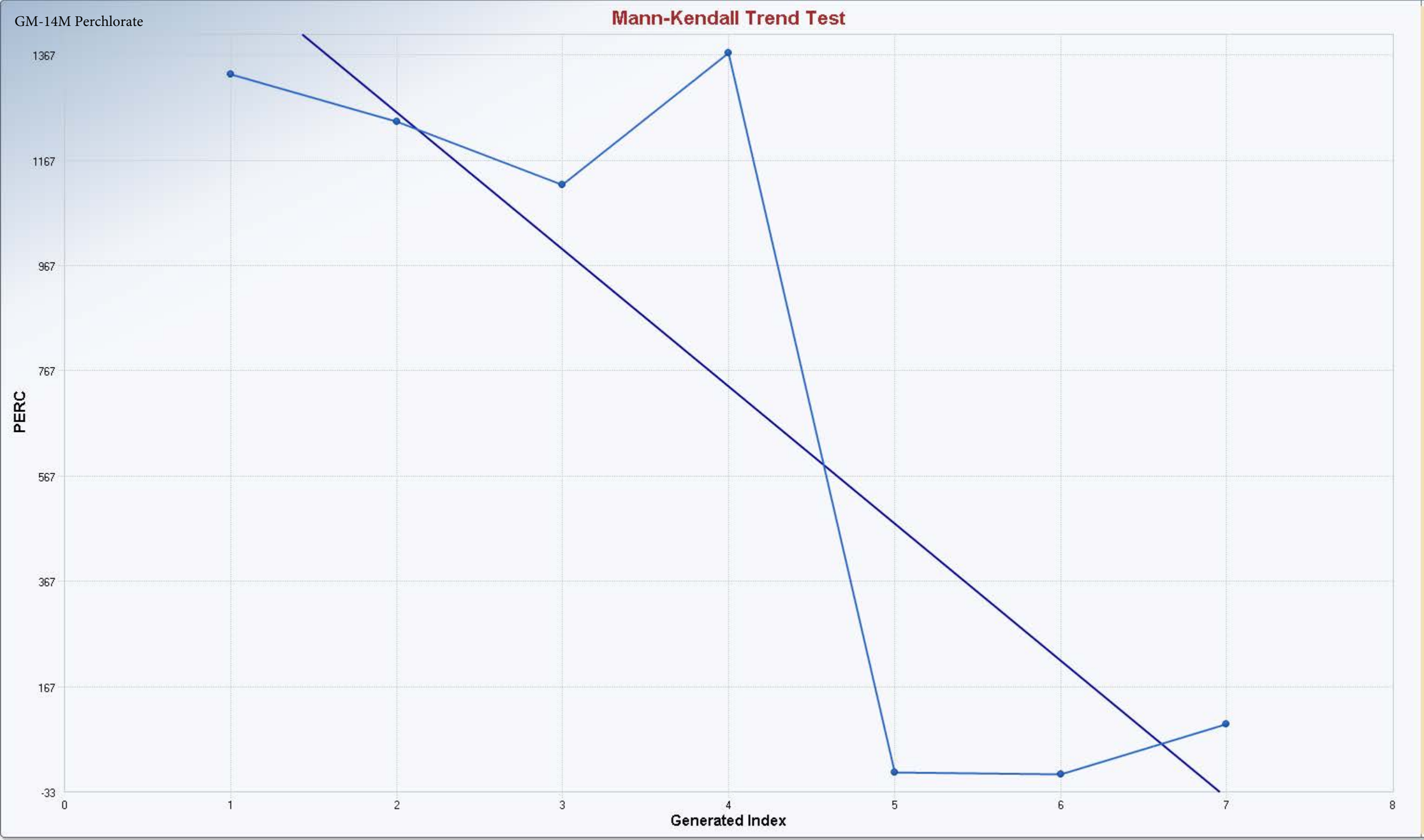
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	8
Number Values Missing	4
Number Values Used	4
Minimum	4.7
Maximum	92
Mean	29.45
Geometric Mean	14.1
Median	10.55
Standard Deviation	41.95
Coefficient of Variation	1.424

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.042
Standard Deviation of S	2.944
Standardized Value of S	-1.698
Approximate p-value	0.0447

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M Perchlorate



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.6583
Standardized Value of S	-1.5019
M-K Test Value (S)	-11
Tabulated p-value	0.0680
Approximate p-value	0.0666

OLS Regression Line (Blue)

OLS Regression Slope	-260.5714
OLS Regression Intercept	1,779.5714

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-14M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:04:00 AM	
From File	GM-14M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	8
Number Values Missing	1
Number Values Used	7
Minimum	1
Maximum	1370
Mean	737.3
Geometric Mean	138.4
Median	1120
Standard Deviation	663.6
Coefficient of Variation	0.9

Mann-Kendall Test

M-K Test Value (S)	-11
Tabulated p-value	0.068
Standard Deviation of S	6.658
Standardized Value of S	-1.502
Approximate p-value	0.0666

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-14M Trichloroethene

Mann-Kendall Trend Analysis

n	8
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	8.0829
Standardized Value of S	-2.1032
M-K Test Value (S)	-18
Tabulated p-value	0.0160
Approximate p-value	0.0177

OLS Regression Line (Blue)

OLS Regression Slope	-252.5952
OLS Regression Intercept	2,024.0786

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:16:32 AM	
From File	GM-14M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

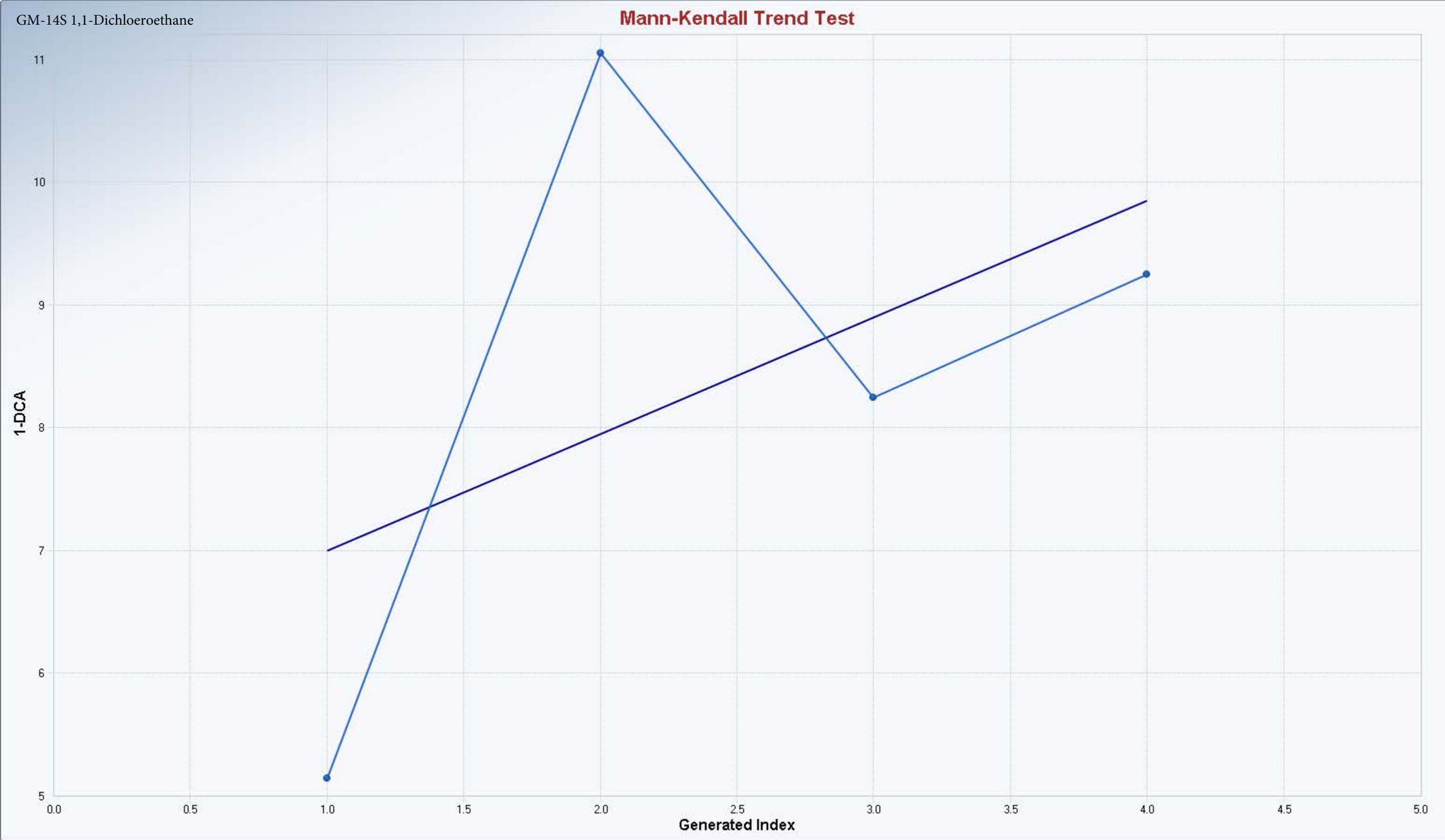
Number or Reported Events Not Used	0
Number of Generated Events	8
Number Values Reported (n)	8
Minimum	2.2
Maximum	1900
Mean	887.4
Geometric Mean	300.5
Median	1100
Standard Deviation	704.5
Coefficient of Variation	0.794

Mann-Kendall Test

M-K Test Value (S)	-18
Tabulated p-value	0.016
Standard Deviation of S	8.083
Standardized Value of S	-2.103
Approximate p-value	0.0177

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	0.3397
M-K Test Value (S)	2
Tabulated p-value	0.3750
Approximate p-value	0.3670

OLS Regression Line (Blue)

OLS Regression Slope	0.9500
OLS Regression Intercept	6.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-14S 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/8/2019 6:13:33 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

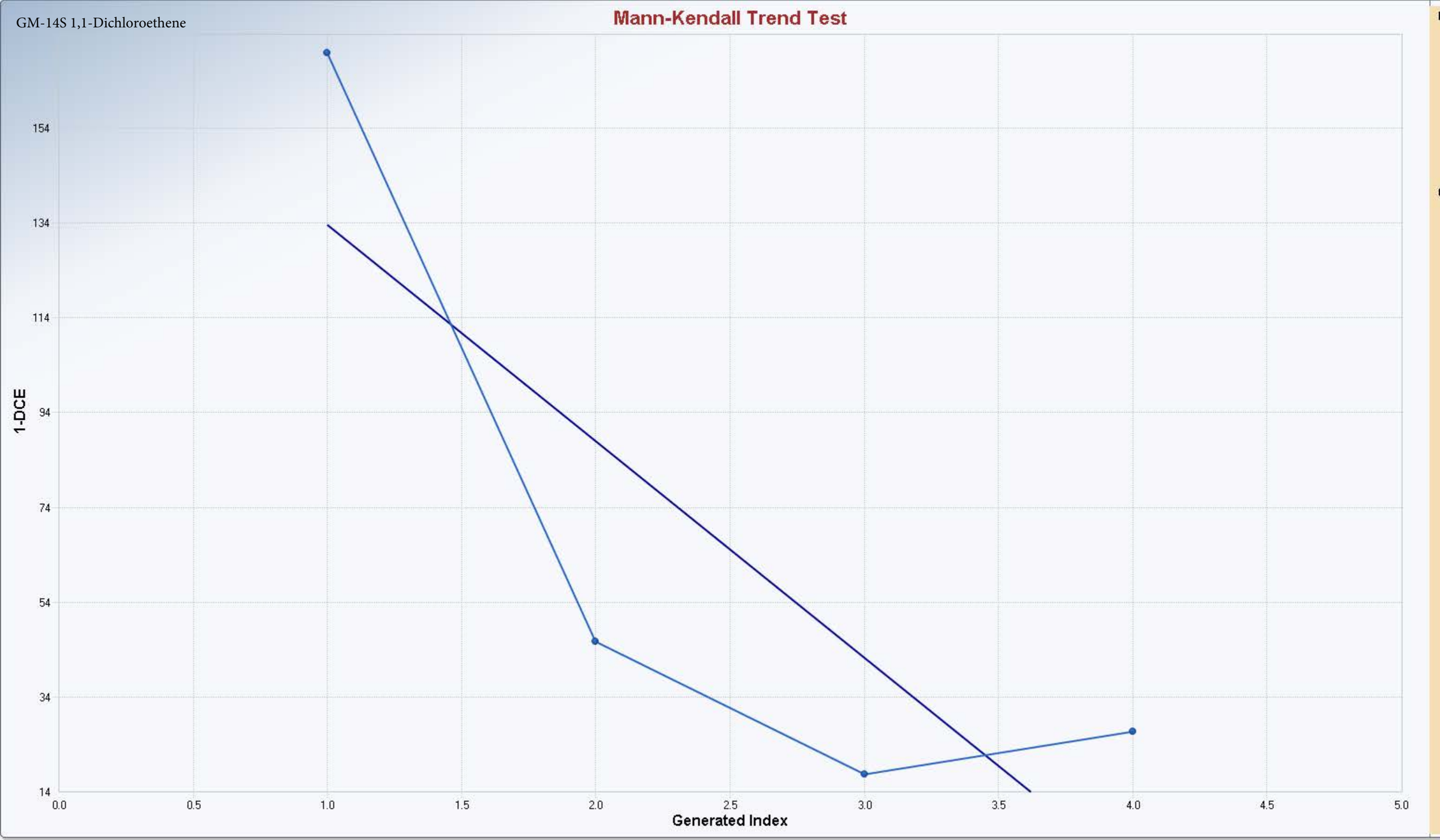
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	5.1
Maximum	11
Mean	8.375
Geometric Mean	8.066
Median	8.7
Standard Deviation	2.472
Coefficient of Variation	0.295

Mann-Kendall Test

M-K Test Value (S)	2
Tabulated p-value	0.375
Standard Deviation of S	2.944
Standardized Value of S	0.34
Approximate p-value	0.367

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-14S 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-45.7000
OLS Regression Intercept	179.5000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-14S 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:33:19 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

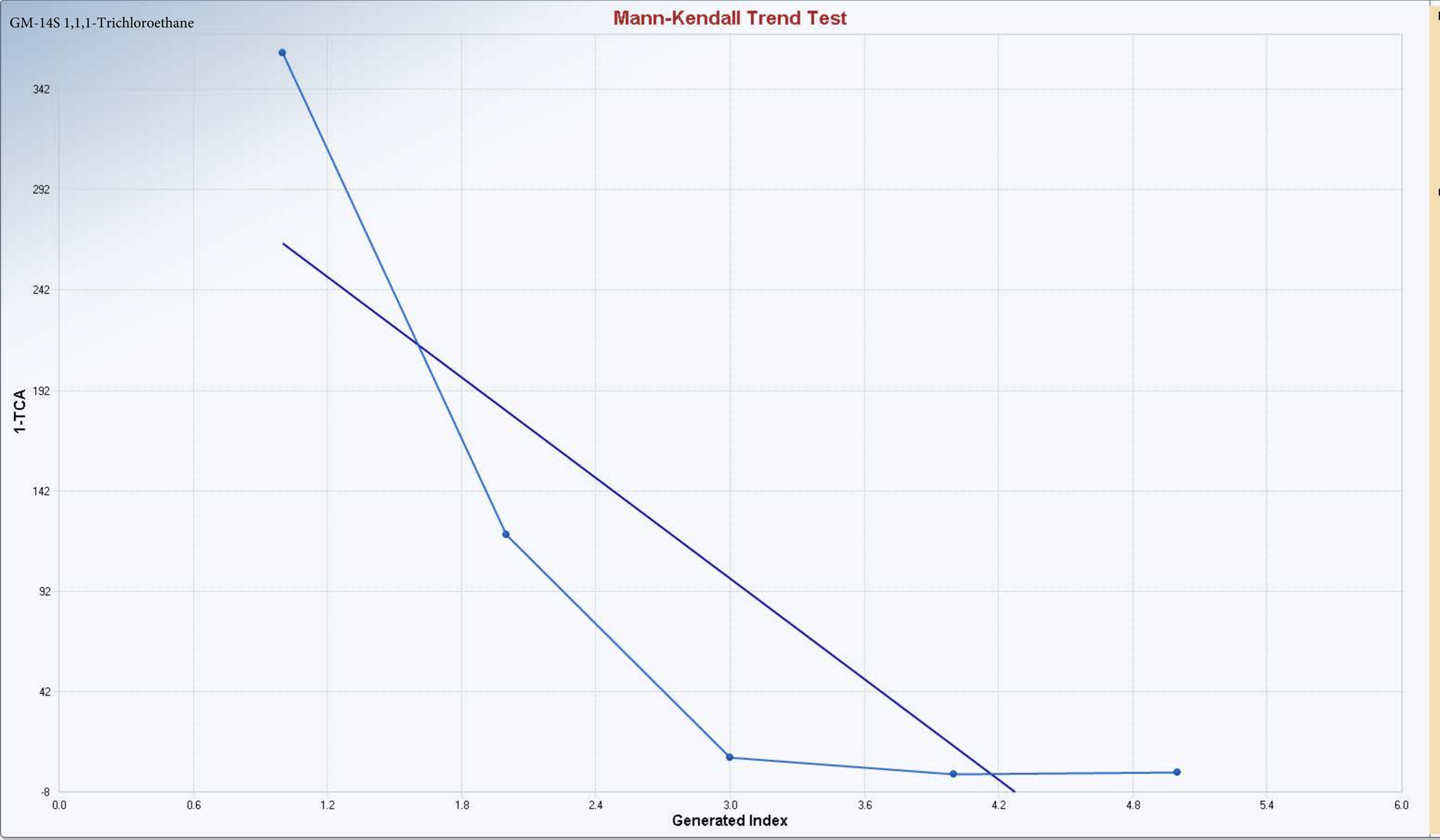
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	18
Maximum	170
Mean	65.25
Geometric Mean	44.15
Median	36.5
Standard Deviation	70.8
Coefficient of Variation	1.085

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-14S 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-83.5800
OLS Regression Intercept	349.0800

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:30:27 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

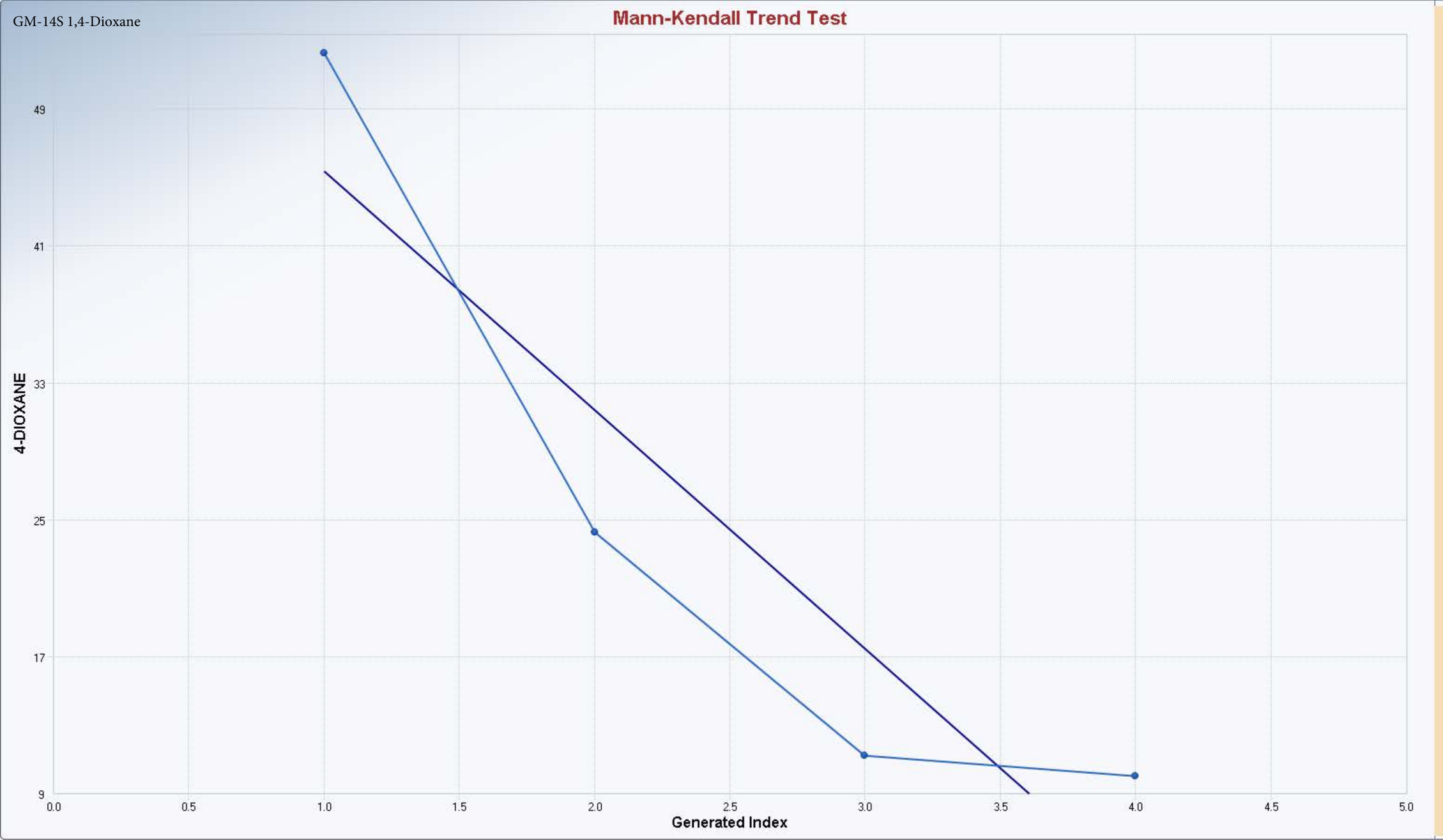
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	1
Maximum	360
Mean	98.34
Geometric Mean	14.45
Median	9.1
Standard Deviation	154.7
Coefficient of Variation	1.573

Mann-Kendall Test

M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.6984
M-K Test Value (S)	-6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)

OLS Regression Slope	-13.9600
OLS Regression Intercept	59.1000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:28:36 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

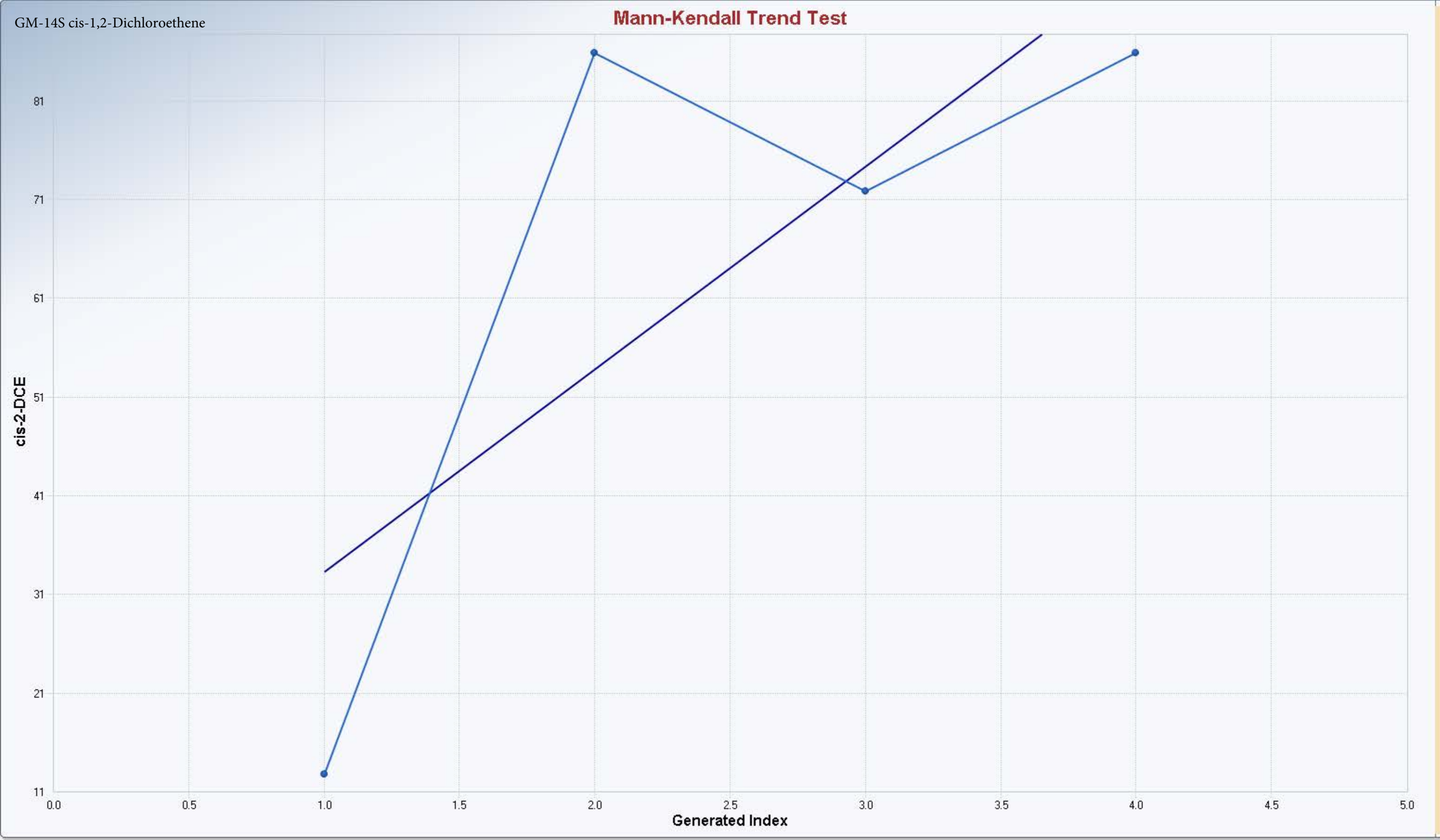
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	9.8
Maximum	52
Mean	24.2
Geometric Mean	19.15
Median	17.5
Standard Deviation	19.62
Coefficient of Variation	0.811

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.042
Standard Deviation of S	2.944
Standardized Value of S	-1.698
Approximate p-value	0.0447

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S cis-1,2-Dichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.7689
Standardized Value of S	0.7223
M-K Test Value (S)	3
Tabulated p-value	0.3750
Approximate p-value	0.2351

OLS Regression Line (Blue)

OLS Regression Slope	20.5000
OLS Regression Intercept	13.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-14S cis-1,2-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:38:47 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

cis-2-DCE

General Statistics

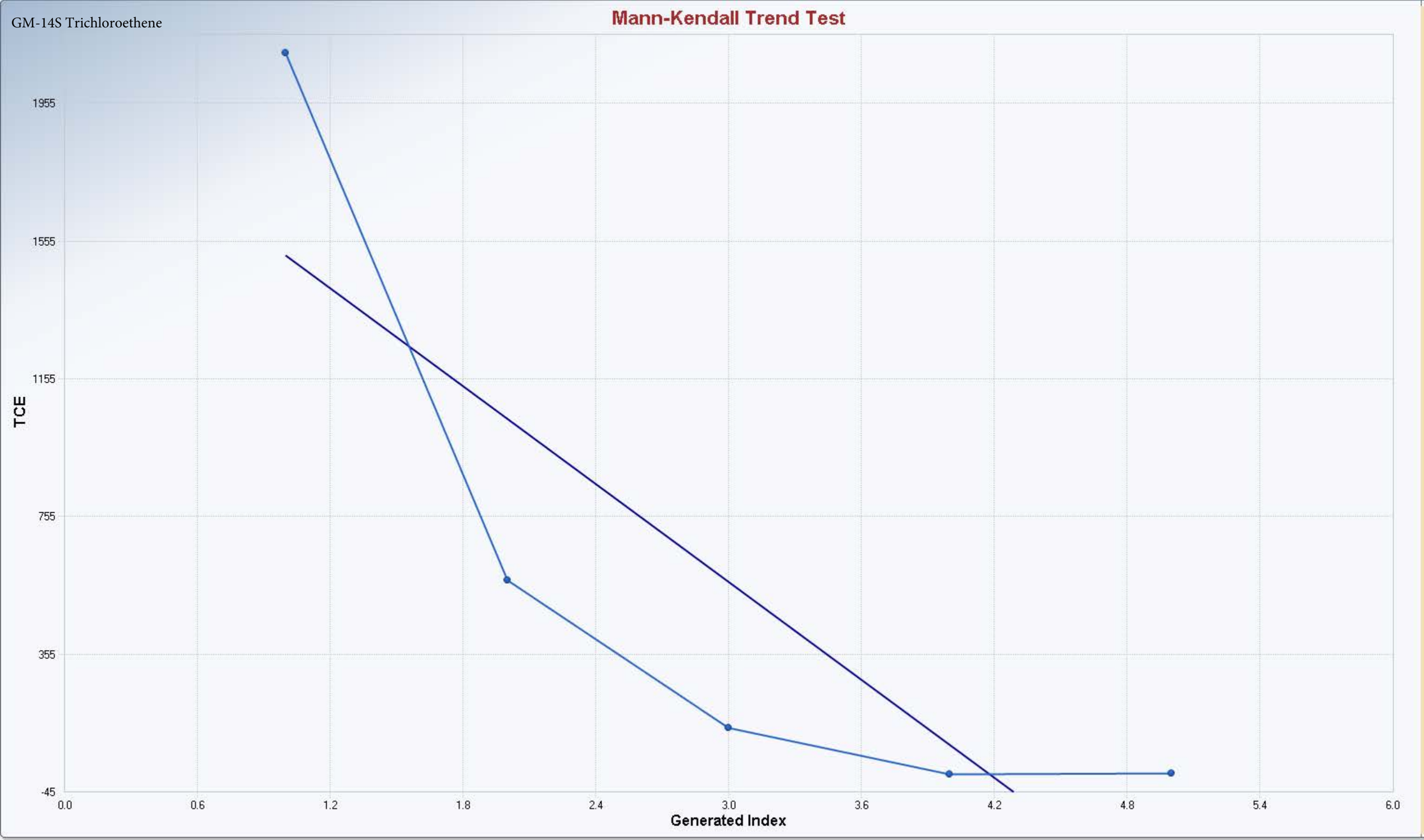
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	13
Maximum	86
Mean	64.25
Geometric Mean	51.29
Median	79
Standard Deviation	34.8
Coefficient of Variation	0.542

Mann-Kendall Test

M-K Test Value (S)	3
Tabulated p-value	0.375
Standard Deviation of S	2.769
Standardized Value of S	0.722
Approximate p-value	0.235

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-14S Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-474.6100
OLS Regression Intercept	1,988.9300

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-14S Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 7:44:43 AM	
From File	GM-14S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

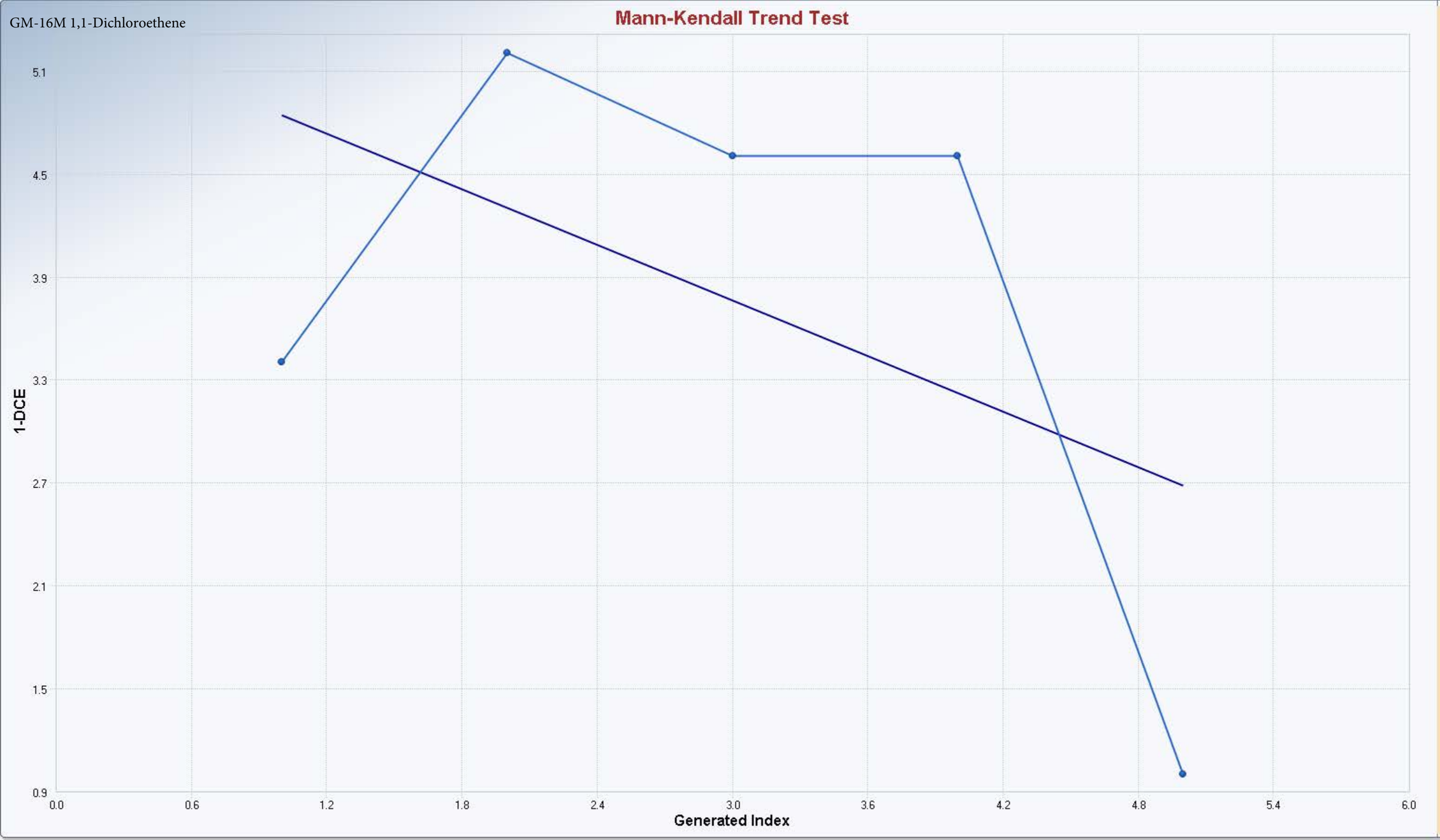
TCE

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	7.1
Maximum	2100
Mean	565.1
Geometric Mean	99.99
Median	140
Standard Deviation	888.5
Coefficient of Variation	1.572

Mann-Kendall Test	
M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-16M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	3.9581
Standardized Value of S	-0.5053
M-K Test Value (S)	-3
Tabulated p-value	0.4080
Approximate p-value	0.3067

OLS Regression Line (Blue)

OLS Regression Slope	-0.5400
OLS Regression Intercept	5.3800

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-16M 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:14:16 AM	
From File	GM-16M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

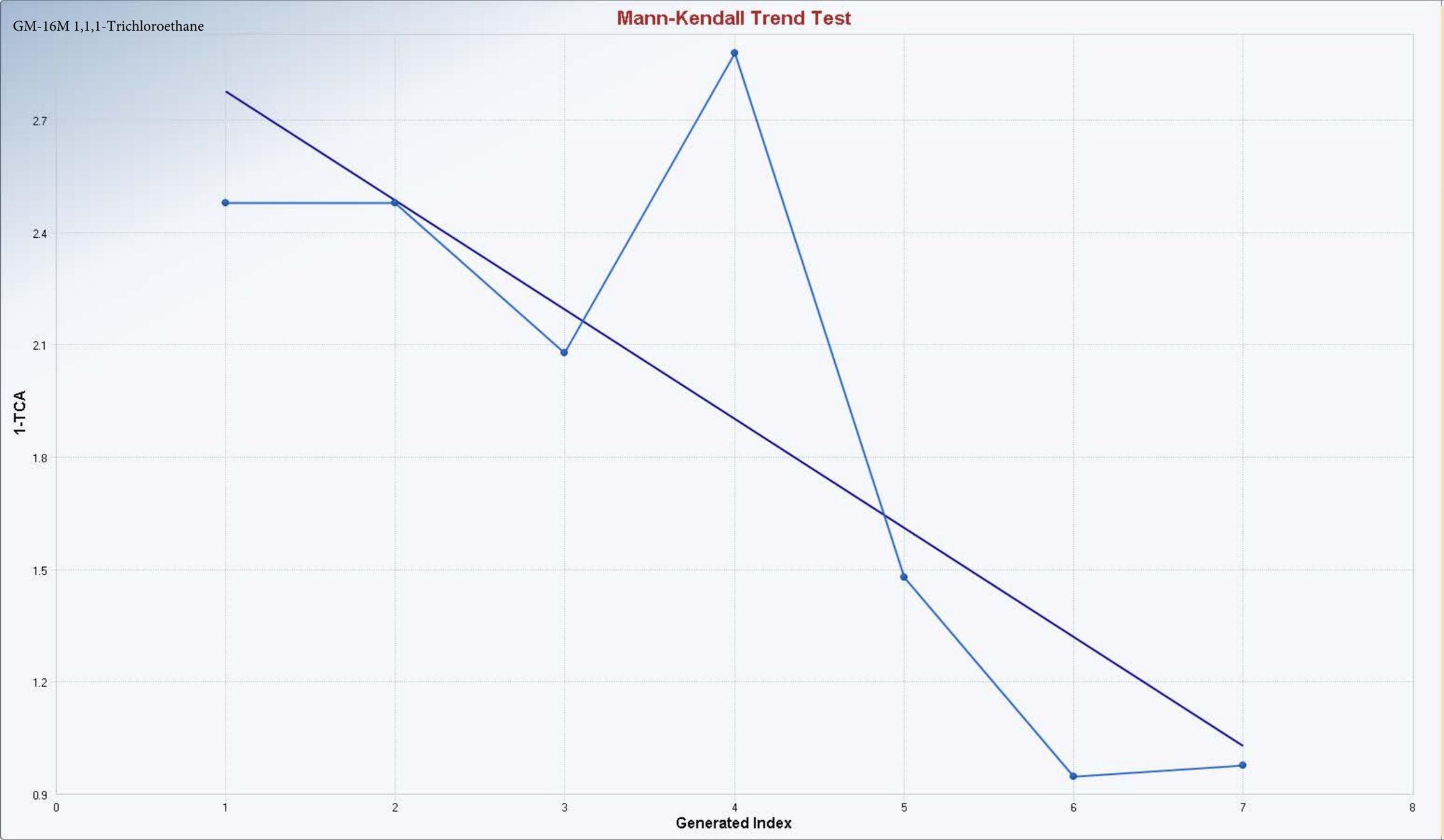
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	8
Number Values Missing	3
Number Values Used	5
Minimum	1
Maximum	5.2
Mean	3.76
Geometric Mean	3.27
Median	4.6
Standard Deviation	1.676
Coefficient of Variation	0.446

Mann-Kendall Test

M-K Test Value (S)	-3
Tabulated p-value	0.408
Standard Deviation of S	3.958
Standardized Value of S	-0.505
Approximate p-value	0.307

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-16M 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.5828
Standardized Value of S	-1.6710
M-K Test Value (S)	-12
Tabulated p-value	0.0350
Approximate p-value	0.0474

OLS Regression Line (Blue)

OLS Regression Slope	-0.2914
OLS Regression Intercept	3.0900

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-16M 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:12:11 AM	
From File	GM-16M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

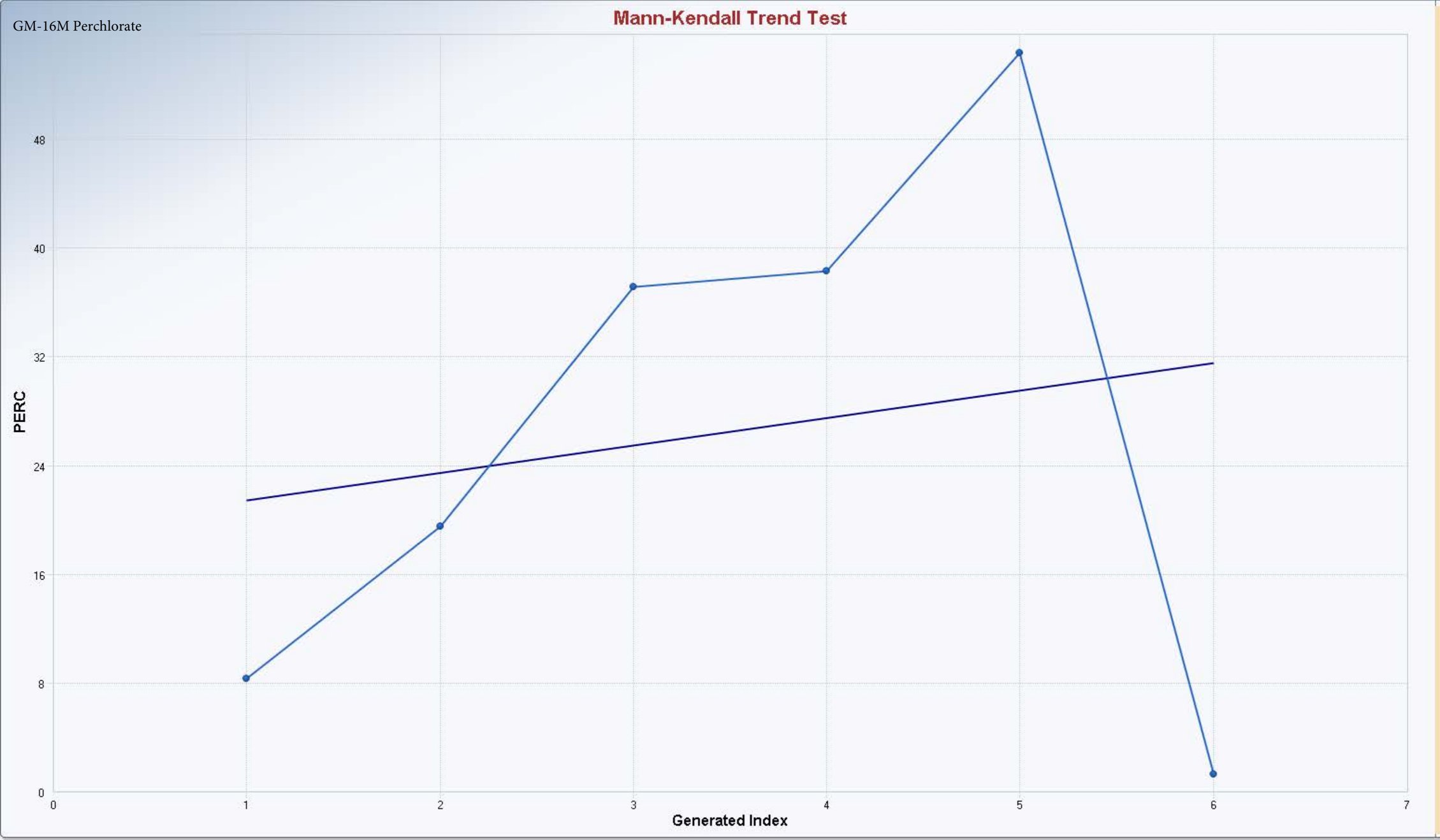
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	8
Number Values Missing	1
Number Values Used	7
Minimum	0.97
Maximum	2.9
Mean	1.924
Geometric Mean	1.774
Median	2.1
Standard Deviation	0.774
Coefficient of Variation	0.402

Mann-Kendall Test

M-K Test Value (S)	-12
Tabulated p-value	0.035
Standard Deviation of S	6.583
Standardized Value of S	-1.671
Approximate p-value	0.0474

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-16M Perchlorate



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	0.7515
M-K Test Value (S)	5
Tabulated p-value	0.2350
Approximate p-value	0.2262

OLS Regression Line (Blue)

OLS Regression Slope	2.0171
OLS Regression Intercept	19.1067

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-16M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:07:50 AM	
From File	GM-16M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

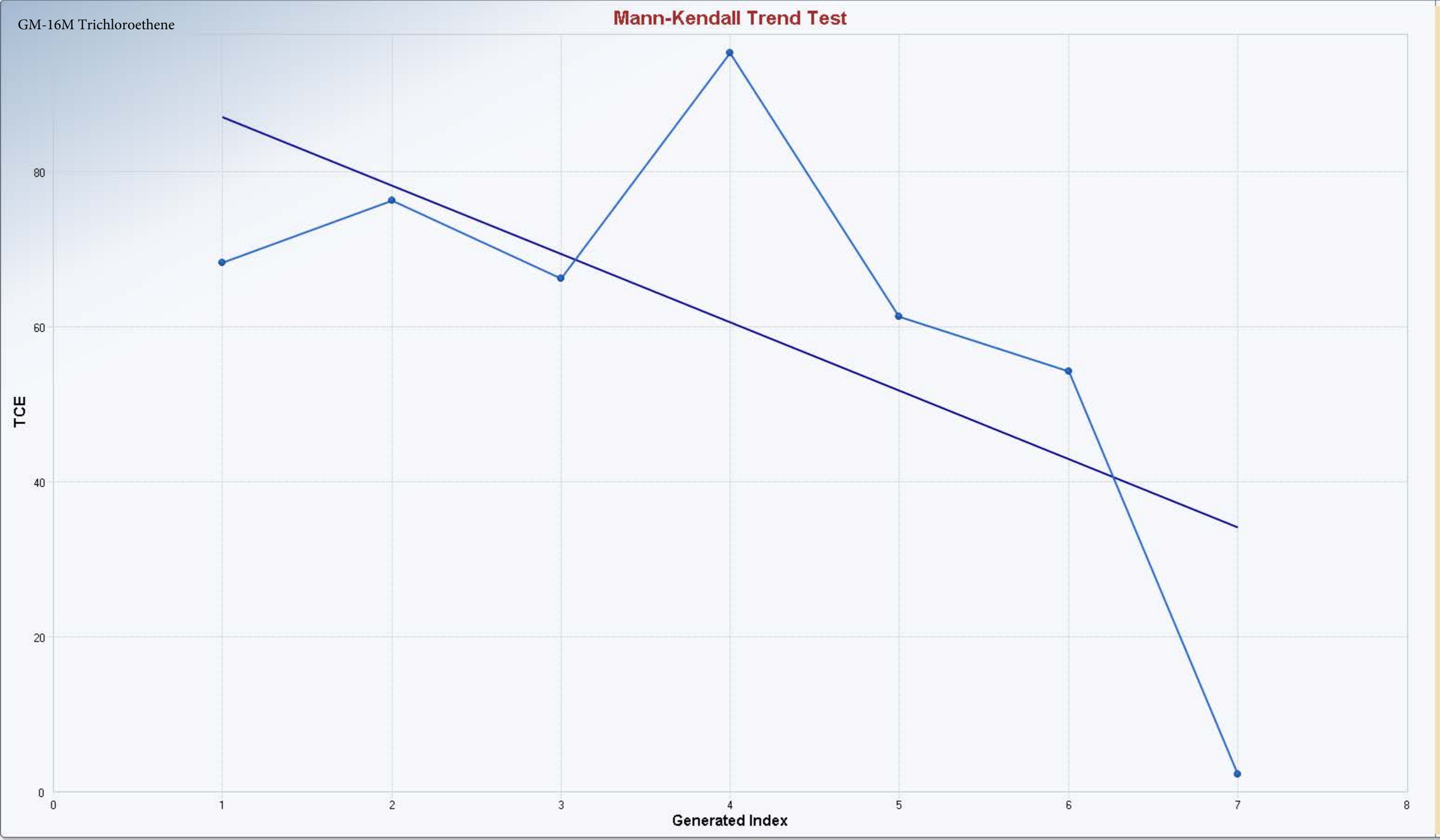
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	8
Number Values Missing	2
Number Values Used	6
Minimum	1
Maximum	54
Mean	26.17
Geometric Mean	15.05
Median	28
Standard Deviation	20.2
Coefficient of Variation	0.772

Mann-Kendall Test

M-K Test Value (S)	5
Tabulated p-value	0.235
Standard Deviation of S	5.323
Standardized Value of S	0.751
Approximate p-value	0.226

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-16M Trichloroethene



Mann-Kendall Trend Analysis

n	7
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	6.6583
Standardized Value of S	-1.8023
M-K Test Value (S)	-13
Tabulated p-value	0.0350
Approximate p-value	0.0358

OLS Regression Line (Blue)

OLS Regression Slope	-8.8107
OLS Regression Intercept	95.5429

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-16M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:15:17 AM	
From File	GM-16M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

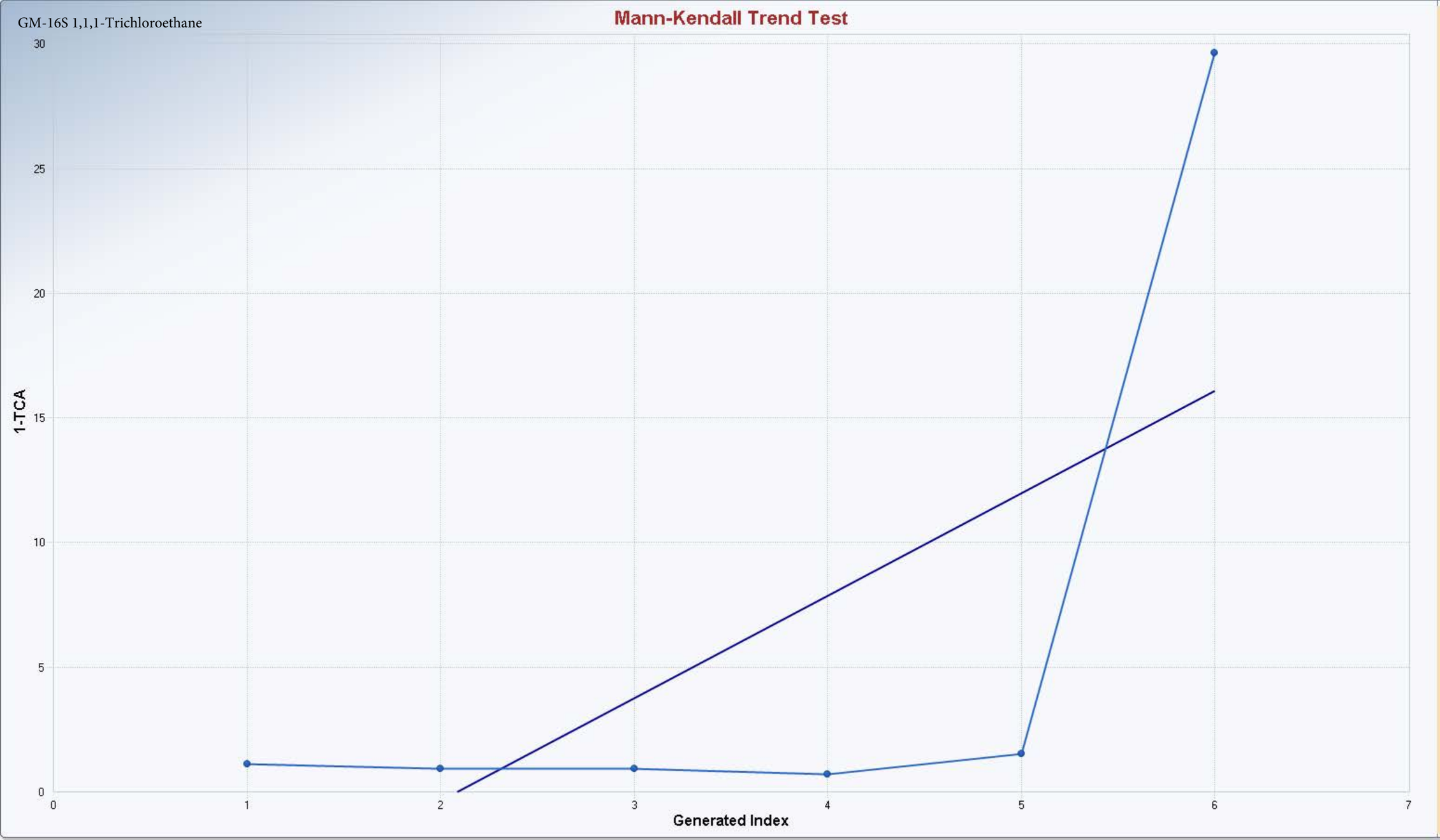
Number or Reported Events Not Used	0
Number of Generated Events	7
Number Values Reported (n)	8
Number Values Missing	1
Number Values Used	7
Minimum	2.1
Maximum	95
Mean	60.3
Geometric Mean	41.83
Median	66
Standard Deviation	28.78
Coefficient of Variation	0.477

Mann-Kendall Test

M-K Test Value (S)	-13
Tabulated p-value	0.035
Standard Deviation of S	6.658
Standardized Value of S	-1.802
Approximate p-value	0.0358

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-16S 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	0.5738
M-K Test Value (S)	4
Tabulated p-value	0.2350
Approximate p-value	0.2830

OLS Regression Line (Blue)

OLS Regression Slope	4.1171
OLS Regression Intercept	-8.2267

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-16S 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:17:24 AM	
From File	GM-16S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

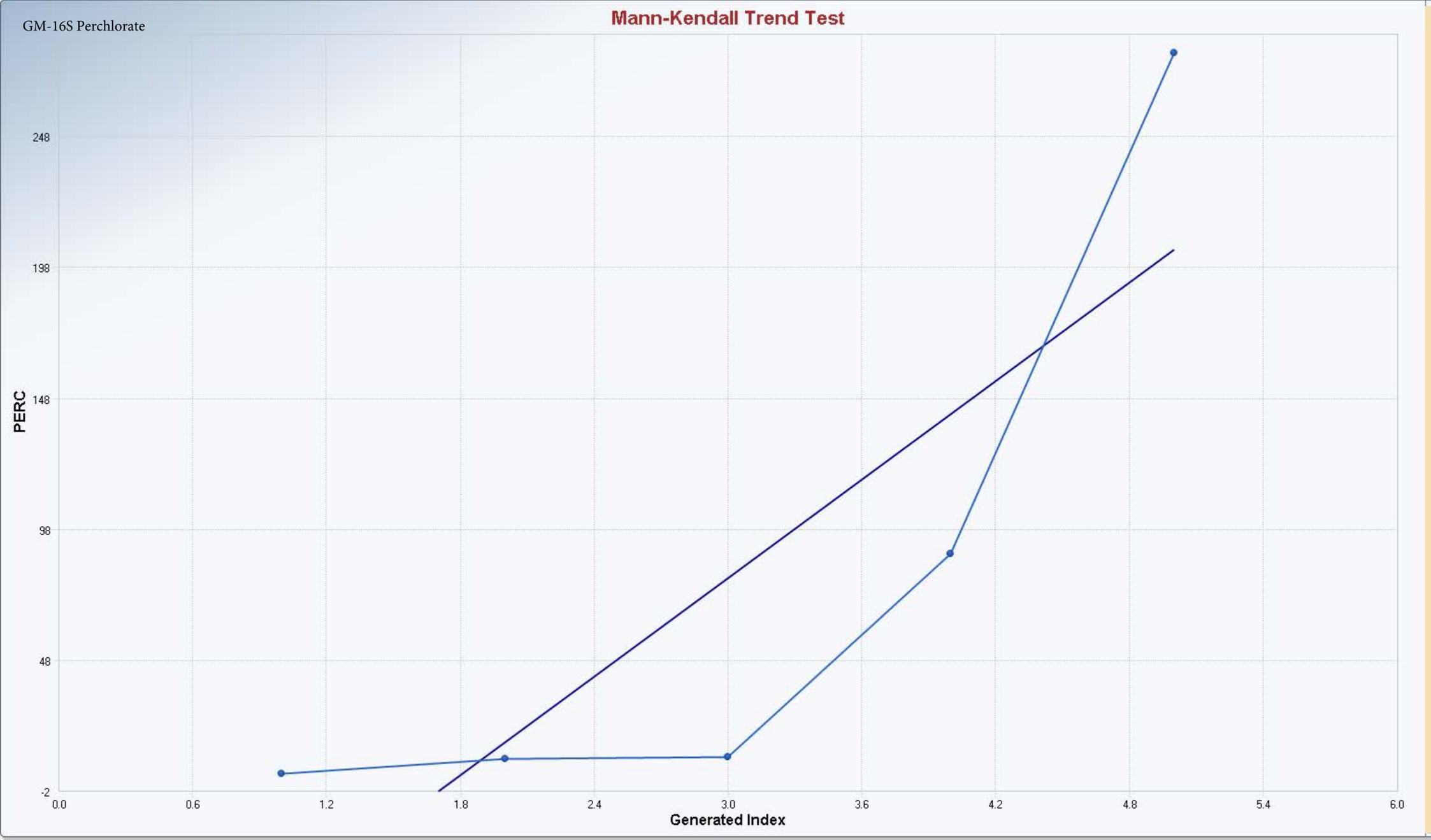
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	1.1
Maximum	30
Mean	6.183
Geometric Mean	2.327
Median	1.4
Standard Deviation	11.67
Coefficient of Variation	1.887

Mann-Kendall Test

M-K Test Value (S)	4
Tabulated p-value	0.235
Standard Deviation of S	5.228
Standardized Value of S	0.574
Approximate p-value	0.283

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-16S Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	2.2045
M-K Test Value (S)	10
Tabulated p-value	0.0080
Approximate p-value	0.0137

OLS Regression Line (Blue)

OLS Regression Slope	62.8600
OLS Regression Intercept	-109.4400

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-16S Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:16:28 AM	
From File	GM-16S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

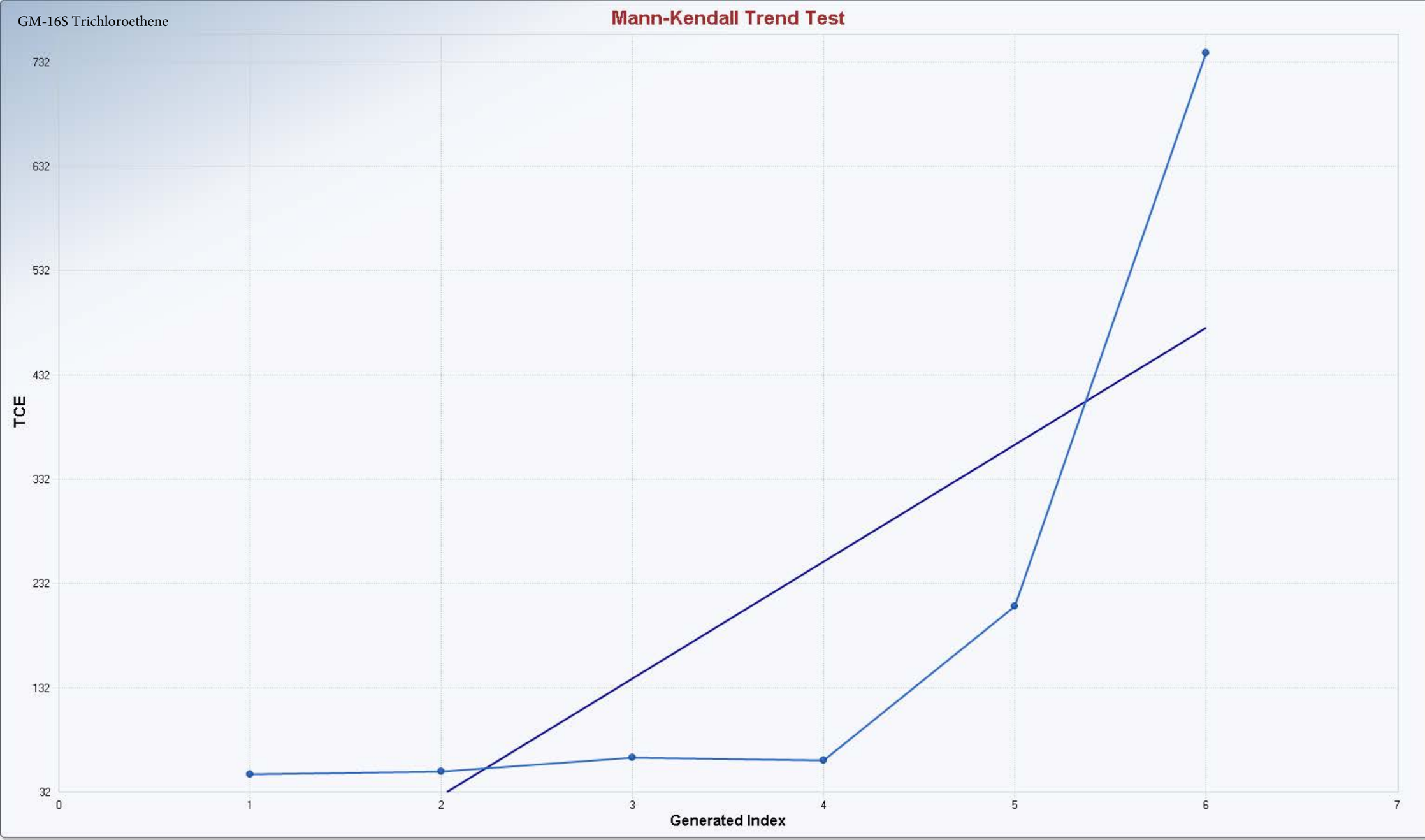
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	6
Number Values Missing	1
Number Values Used	5
Minimum	5
Maximum	280
Mean	79.14
Geometric Mean	27.11
Median	11.3
Standard Deviation	117.5
Coefficient of Variation	1.485

Mann-Kendall Test

M-K Test Value (S)	10
Tabulated p-value	0.008
Standard Deviation of S	4.082
Standardized Value of S	2.205
Approximate p-value	0.0137

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-16S Trichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	2.2544
M-K Test Value (S)	13
Tabulated p-value	0.0080
Approximate p-value	0.0121

OLS Regression Line (Blue)

OLS Regression Slope	112.2571
OLS Regression Intercept	-196.7333

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-16S Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:18:40 AM	
From File	GM-16S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

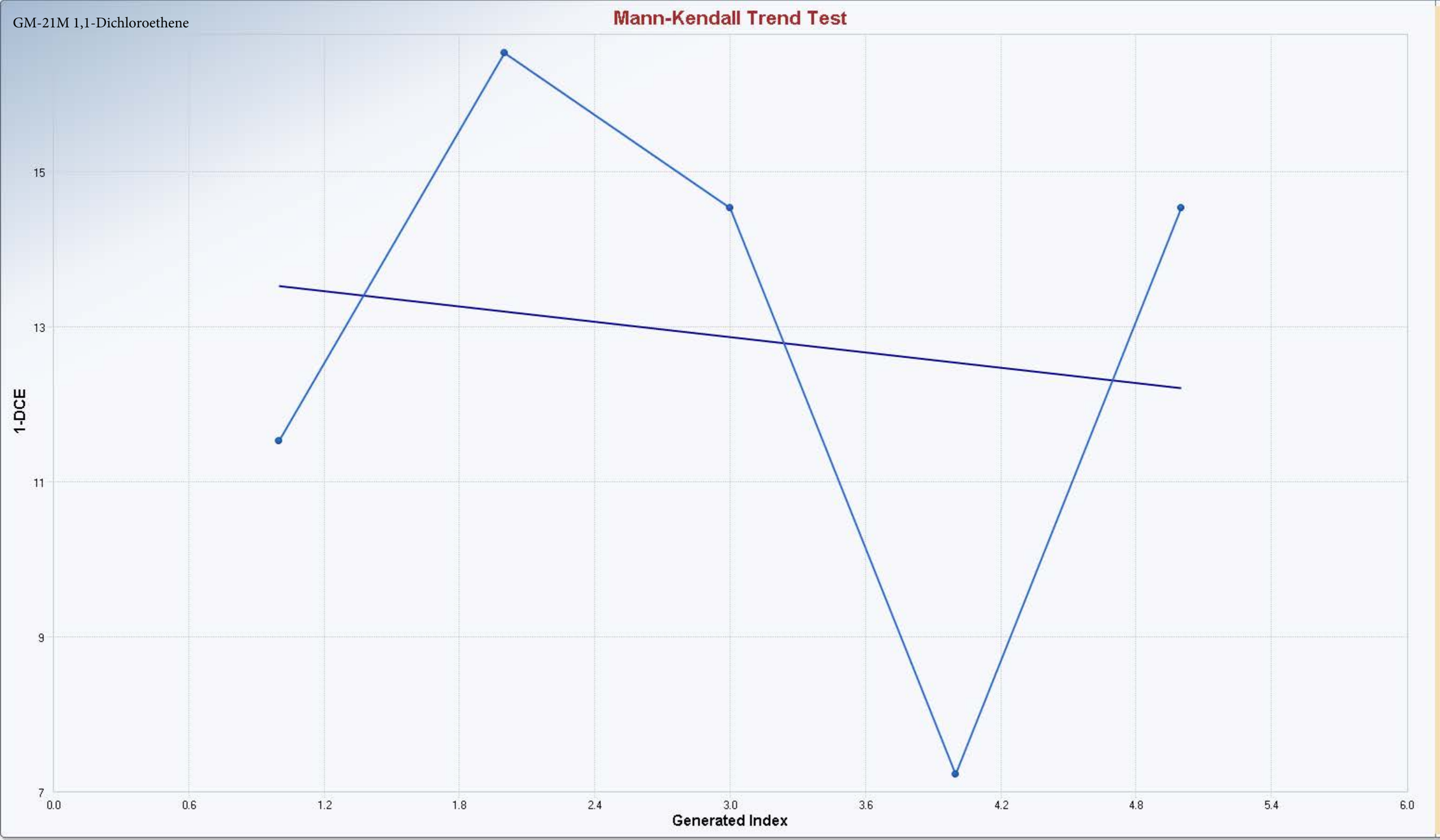
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	49
Maximum	740
Mean	196.2
Geometric Mean	107.8
Median	63.5
Standard Deviation	273.5
Coefficient of Variation	1.394

Mann-Kendall Test

M-K Test Value (S)	13
Tabulated p-value	0.008
Standard Deviation of S	5.323
Standardized Value of S	2.254
Approximate p-value	0.0121

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-21M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	3.9581
Standardized Value of S	0.0000
M-K Test Value (S)	-1
Tabulated p-value	0.5920
Approximate p-value	0.5000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3300
OLS Regression Intercept	14.3300

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21M 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:26:12 AM	
From File	GM-21M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

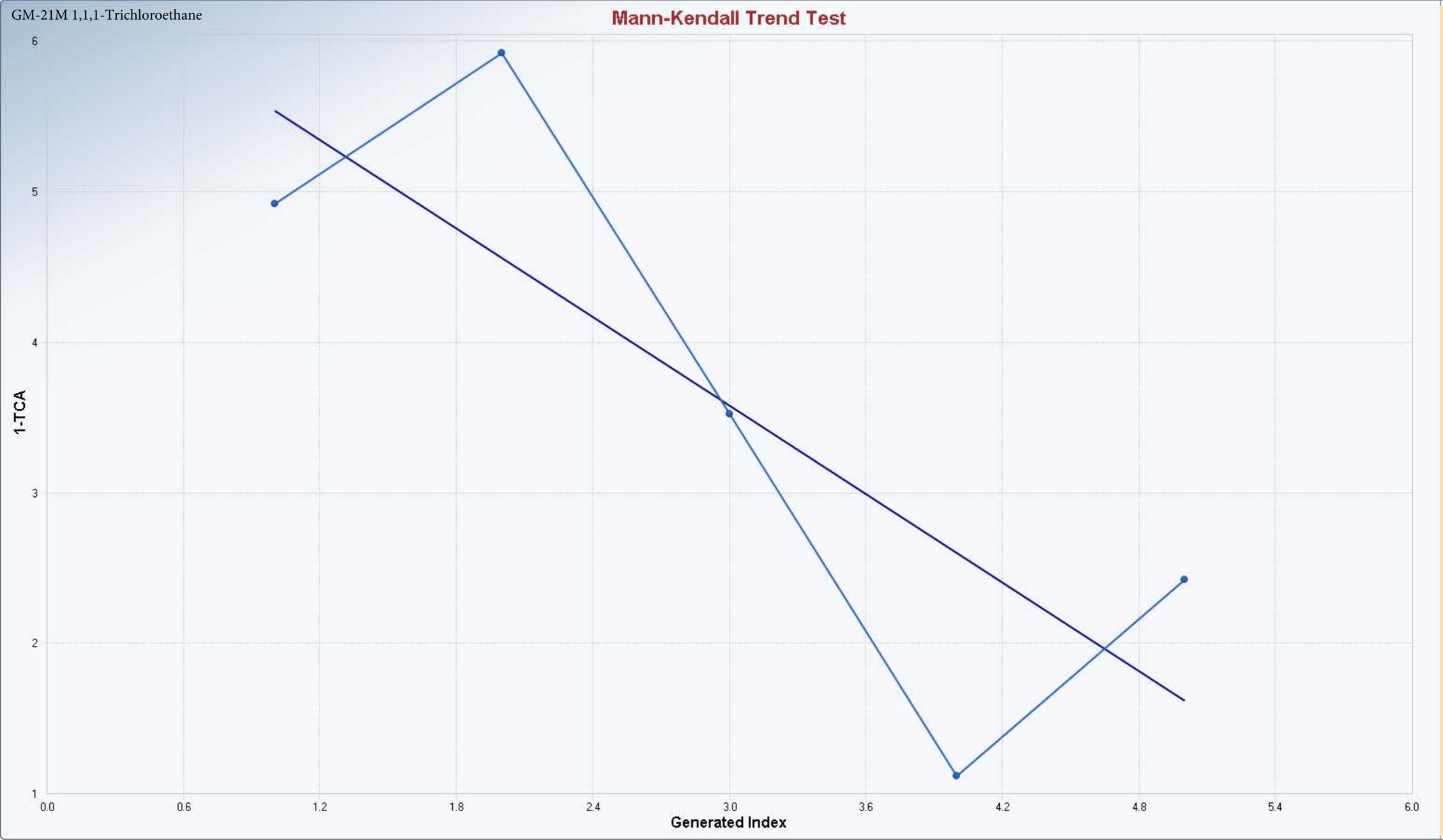
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	7.7
Maximum	17
Mean	13.34
Geometric Mean	12.87
Median	15
Standard Deviation	3.623
Coefficient of Variation	0.272

Mann-Kendall Test

M-K Test Value (S)	-1
Tabulated p-value	0.592
Standard Deviation of S	3.958
Standardized Value of S	0
Approximate p-value	0.5

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21M 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.2247
M-K Test Value (S)	-6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	-0.9800
OLS Regression Intercept	6.8000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21M 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:22:01 AM	
From File	GM-21M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

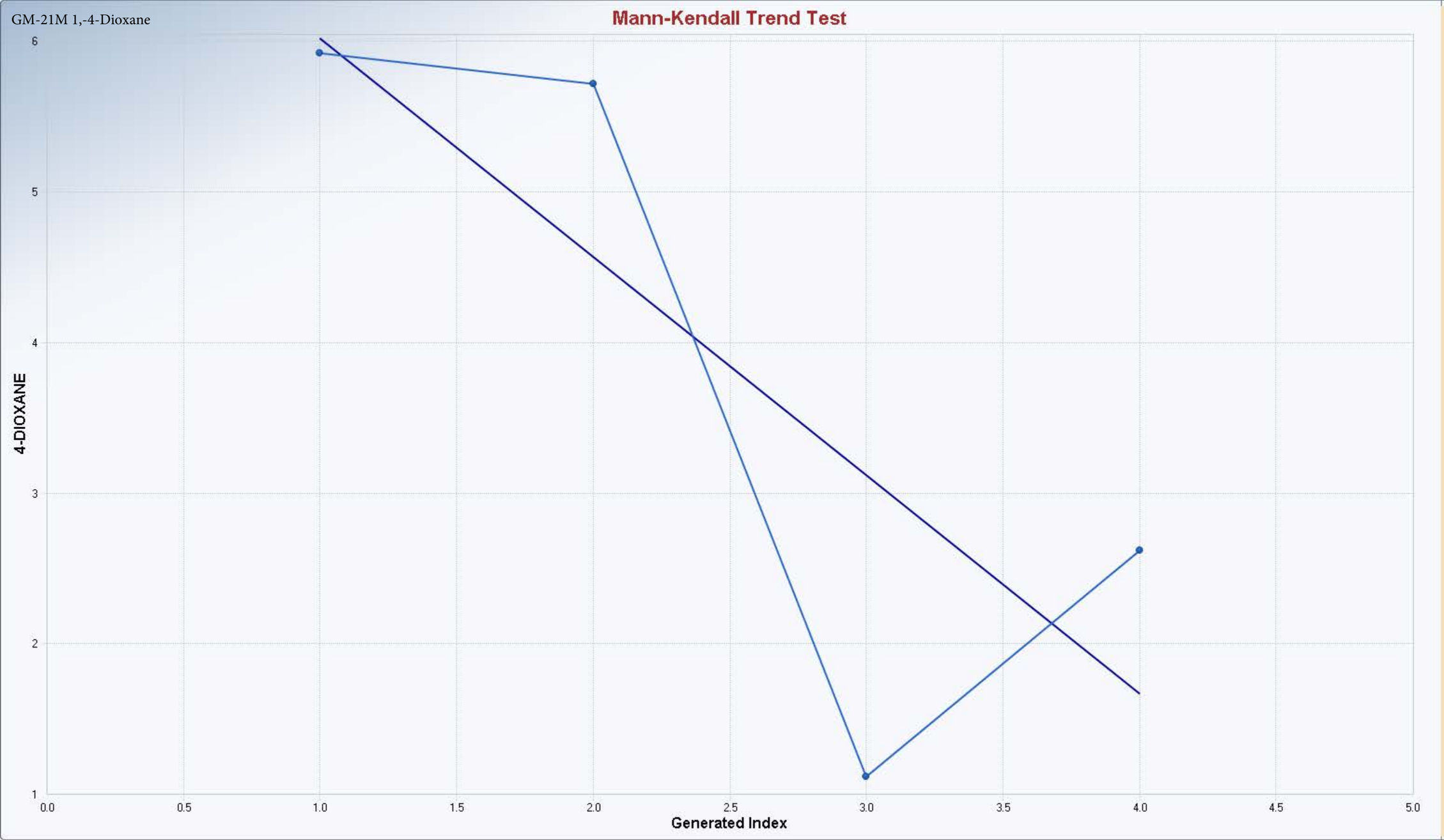
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	1.4
Maximum	6.2
Mean	3.86
Geometric Mean	3.413
Median	3.8
Standard Deviation	1.915
Coefficient of Variation	0.496

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	-1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21M 1,-4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-1.4500
OLS Regression Intercept	7.9500

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21M 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:20:50 AM	
From File	GM-21M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

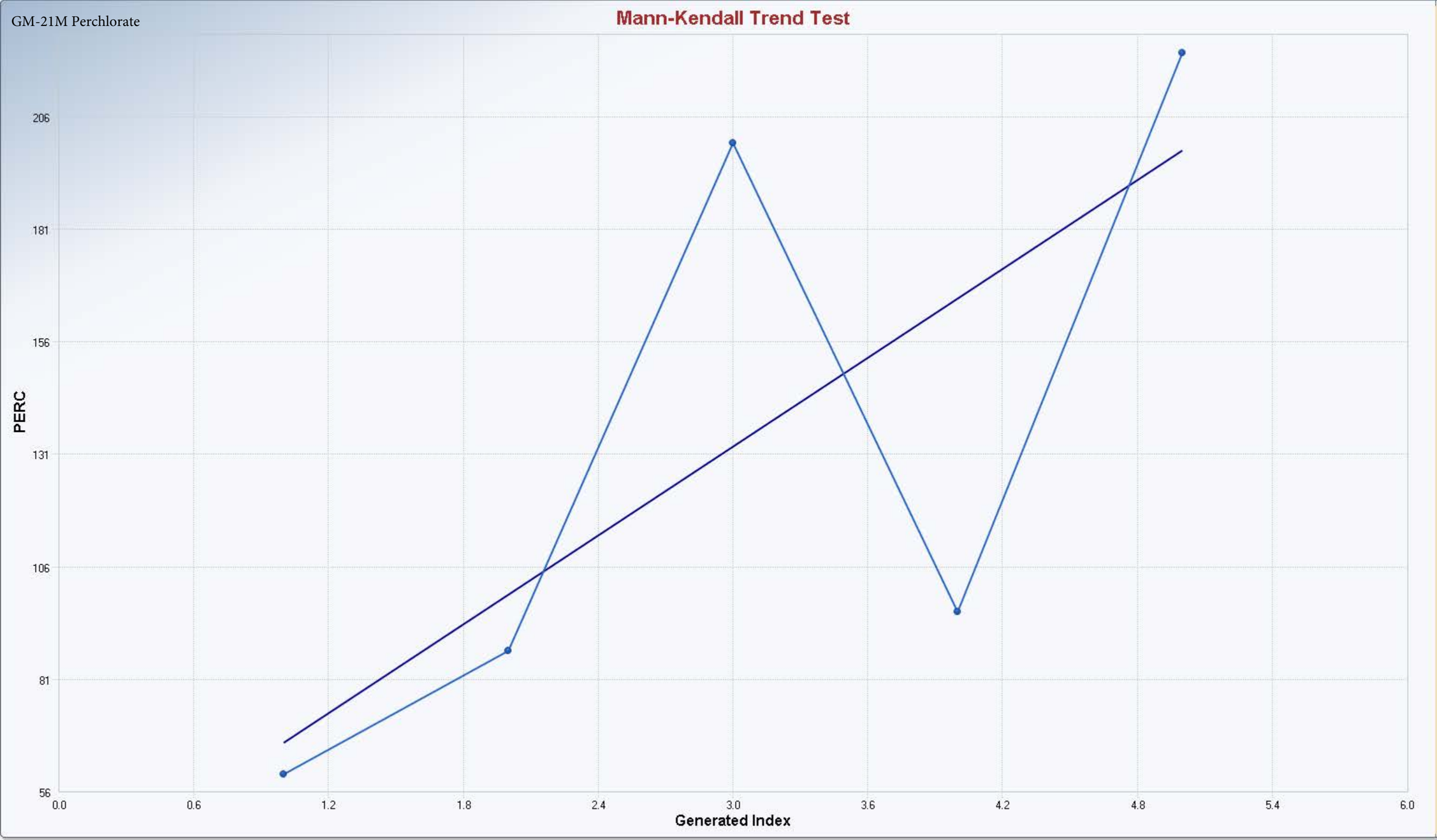
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	1.6
Maximum	6.4
Mean	4.325
Geometric Mean	3.746
Median	4.65
Standard Deviation	2.363
Coefficient of Variation	0.546

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21M Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	1.7146
M-K Test Value (S)	8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	32.8900
OLS Regression Intercept	33.9700

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-21M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:19:51 AM	
From File	GM-21M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

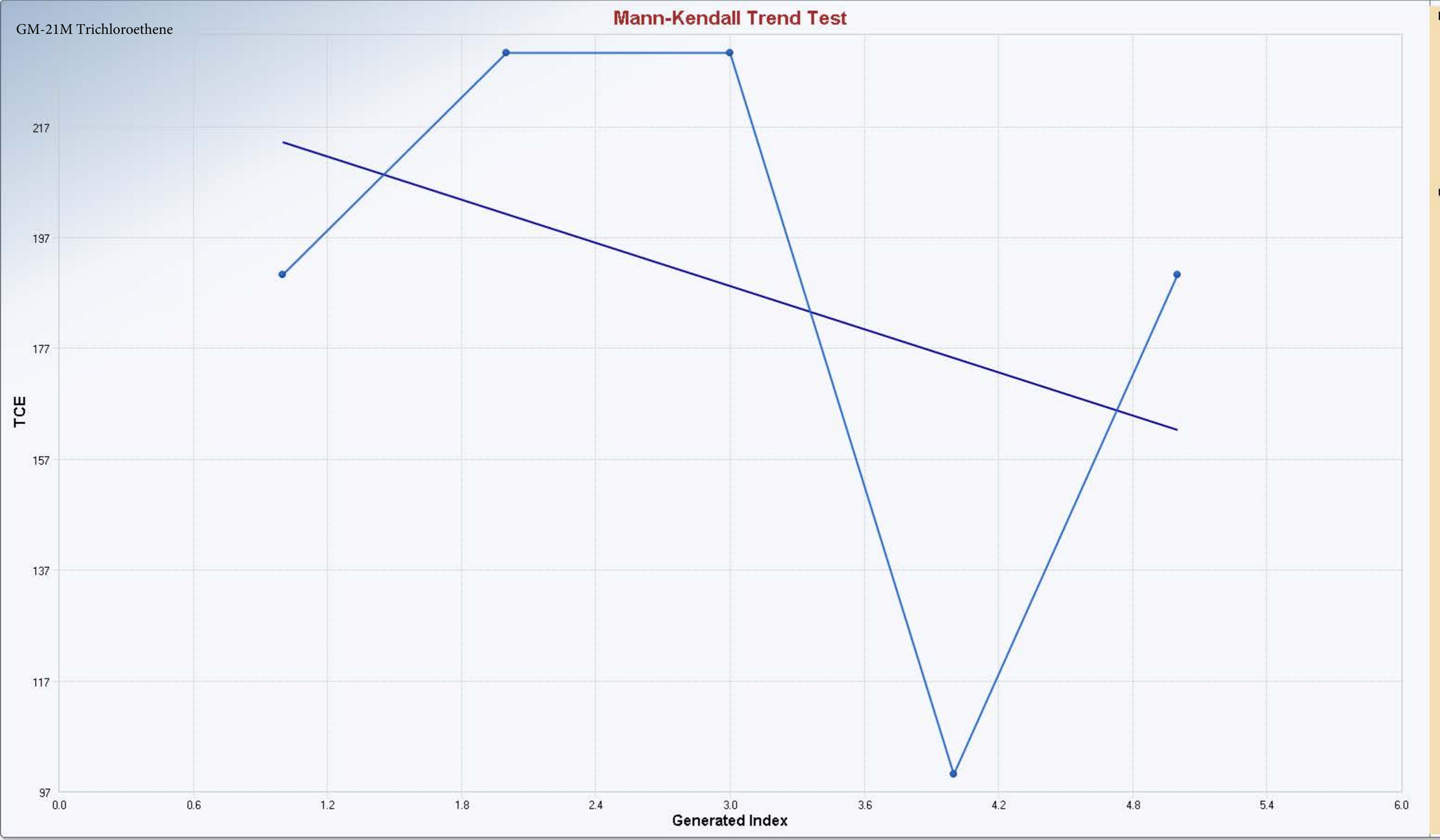
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	59.9
Maximum	220
Mean	132.6
Geometric Mean	117.2
Median	96
Standard Deviation	72.21
Coefficient of Variation	0.544

Mann-Kendall Test

M-K Test Value (S)	8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	1.715
Approximate p-value	0.0432

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-21M Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	3.8297
Standardized Value of S	-0.2611
M-K Test Value (S)	-2
Tabulated p-value	0.4080
Approximate p-value	0.3970

OLS Regression Line (Blue)

OLS Regression Slope	-13.0000
OLS Regression Intercept	227.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/1/2019 8:27:22 AM	
From File	GM-21M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

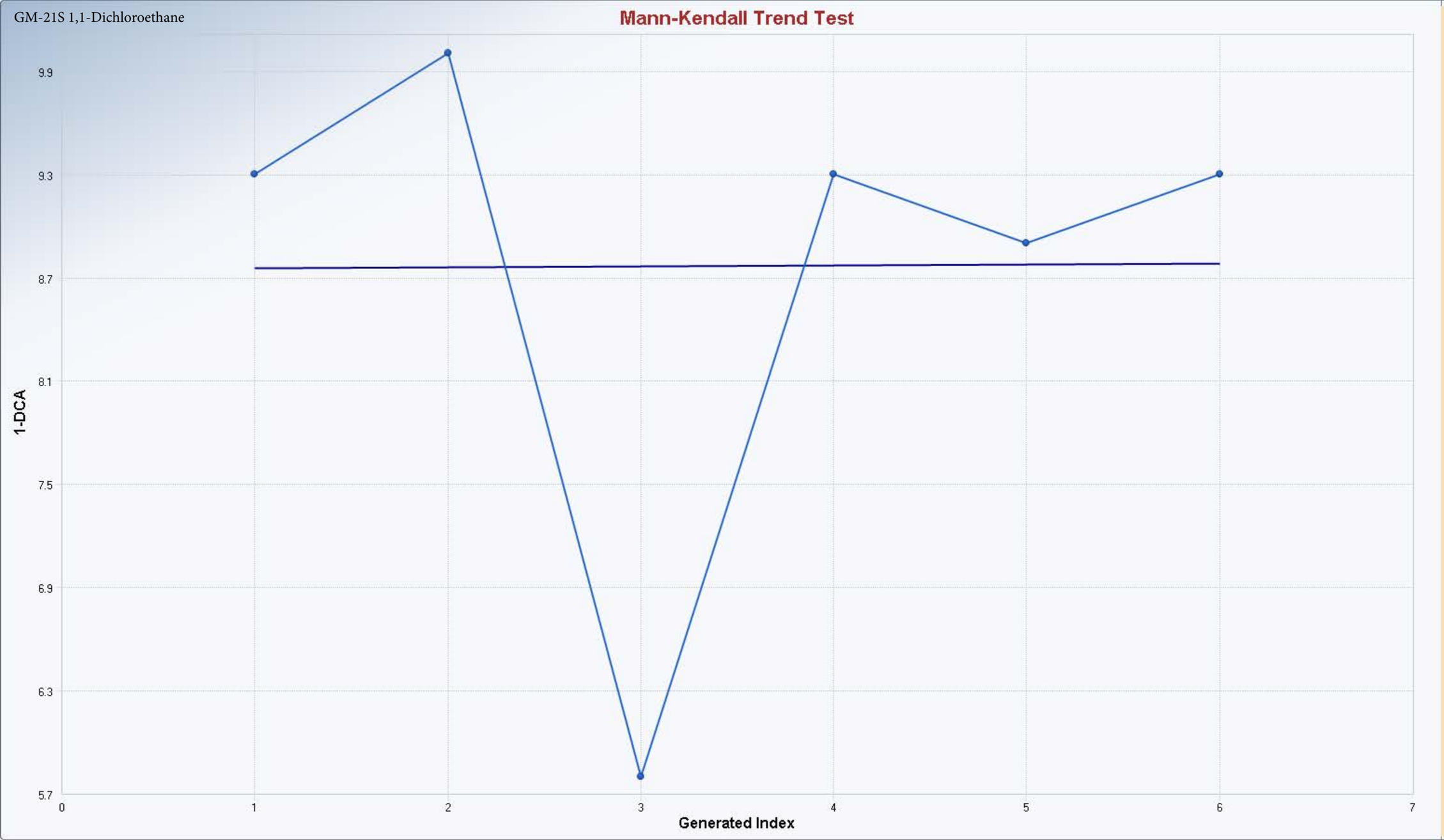
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	100
Maximum	230
Mean	188
Geometric Mean	180.4
Median	190
Standard Deviation	53.1
Coefficient of Variation	0.282

Mann-Kendall Test

M-K Test Value (S)	-2
Tabulated p-value	0.408
Standard Deviation of S	3.83
Standardized Value of S	-0.261
Approximate p-value	0.397

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.9666
Standardized Value of S	-0.2013
M-K Test Value (S)	-2
Tabulated p-value	0.3600
Approximate p-value	0.4202

OLS Regression Line (Blue)

OLS Regression Slope	0.0057
OLS Regression Intercept	8.7467

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:28:04 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

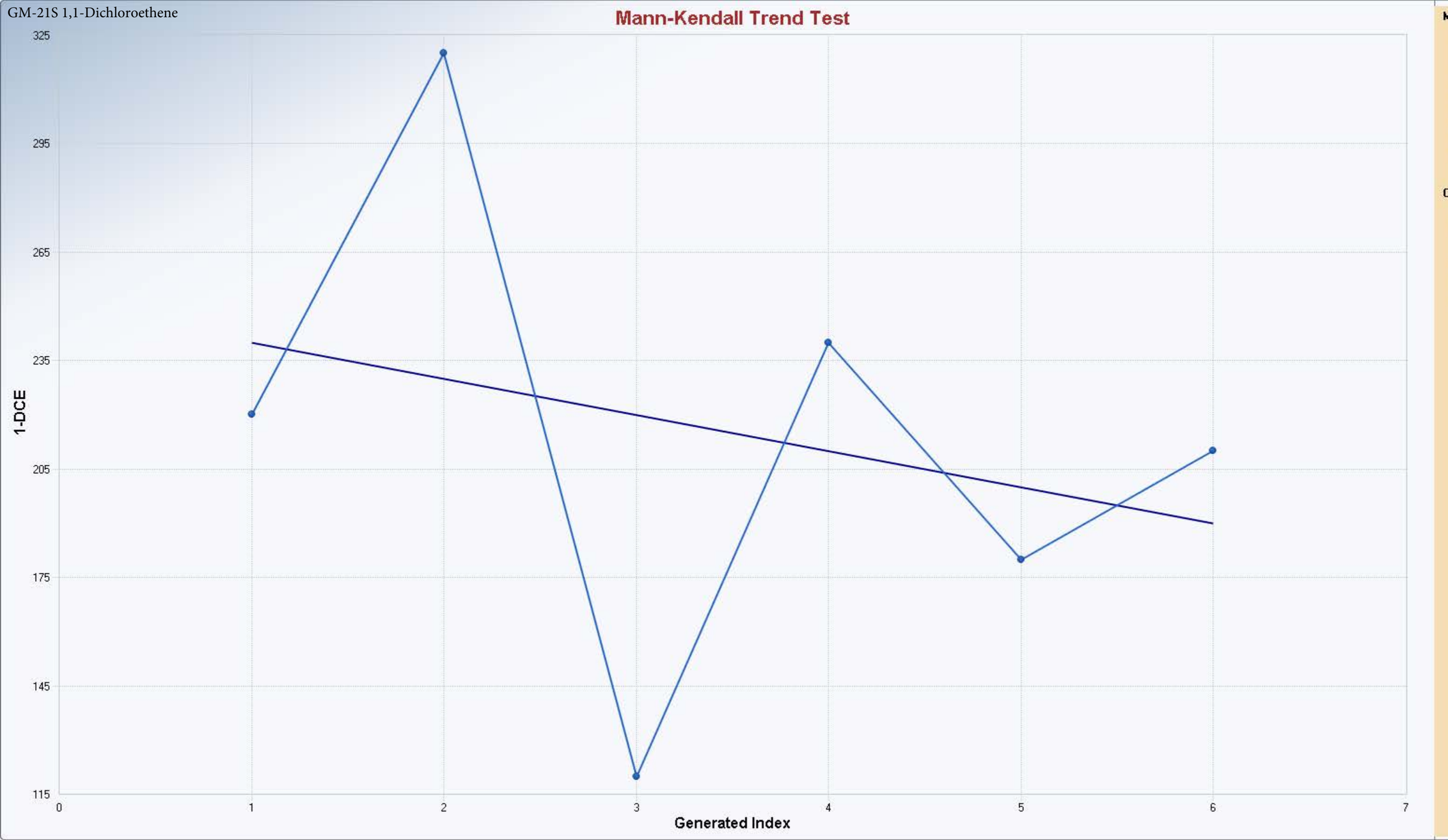
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	5.8
Maximum	10
Mean	8.767
Geometric Mean	8.637
Median	9.3
Standard Deviation	1.496
Coefficient of Variation	0.171

Mann-Kendall Test

M-K Test Value (S)	-2
Tabulated p-value	0.36
Standard Deviation of S	4.967
Standardized Value of S	-0.201
Approximate p-value	0.42

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-0.3757
M-K Test Value (S)	-3
Tabulated p-value	0.3600
Approximate p-value	0.3536

OLS Regression Line (Blue)

OLS Regression Slope	-10.0000
OLS Regression Intercept	250.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:29:00 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

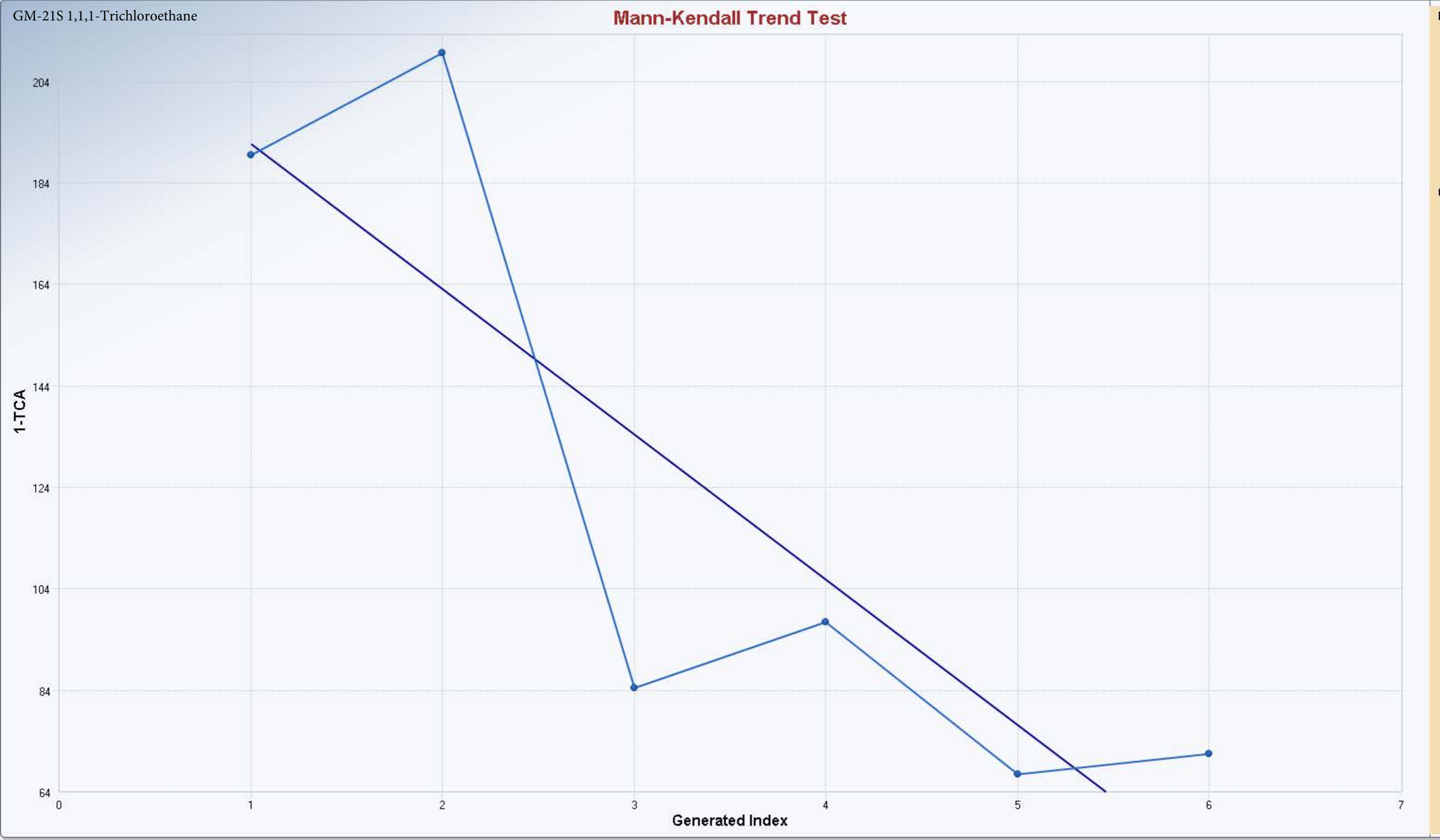
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	120
Maximum	320
Mean	215
Geometric Mean	206.1
Median	215
Standard Deviation	66.26
Coefficient of Variation	0.308

Mann-Kendall Test

M-K Test Value (S)	-3
Tabulated p-value	0.36
Standard Deviation of S	5.323
Standardized Value of S	-0.376
Approximate p-value	0.354

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-1.5029
M-K Test Value (S)	-9
Tabulated p-value	0.0680
Approximate p-value	0.0664

OLS Regression Line (Blue)

OLS Regression Slope	-28.6571
OLS Regression Intercept	220.8000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:26:28 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

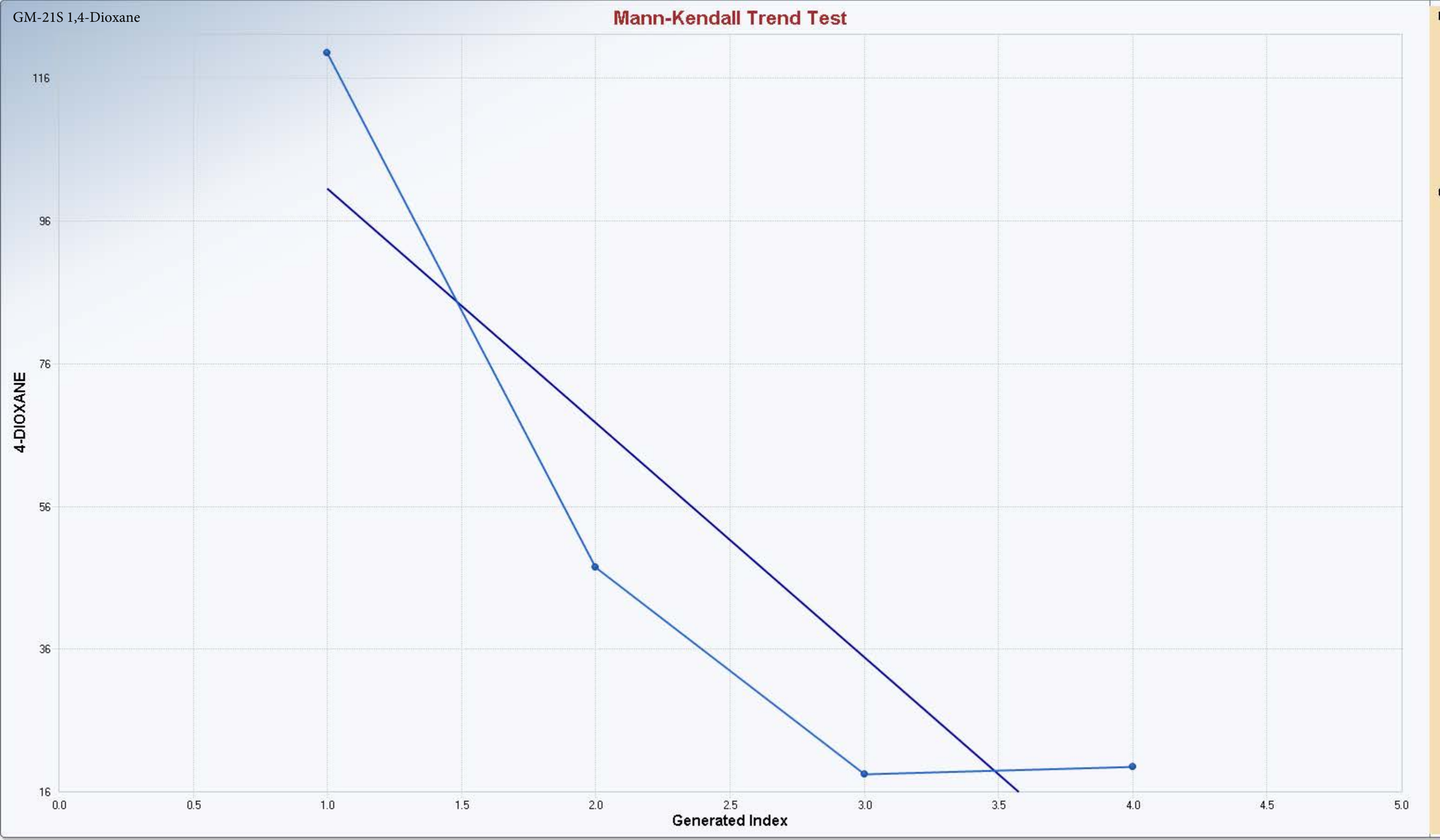
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	68
Maximum	210
Mean	120.5
Geometric Mean	108.5
Median	91.5
Standard Deviation	62.79
Coefficient of Variation	0.521

Mann-Kendall Test

M-K Test Value (S)	-9
Tabulated p-value	0.068
Standard Deviation of S	5.323
Standardized Value of S	-1.503
Approximate p-value	0.0664

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-32.9000
OLS Regression Intercept	134.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:25:35 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

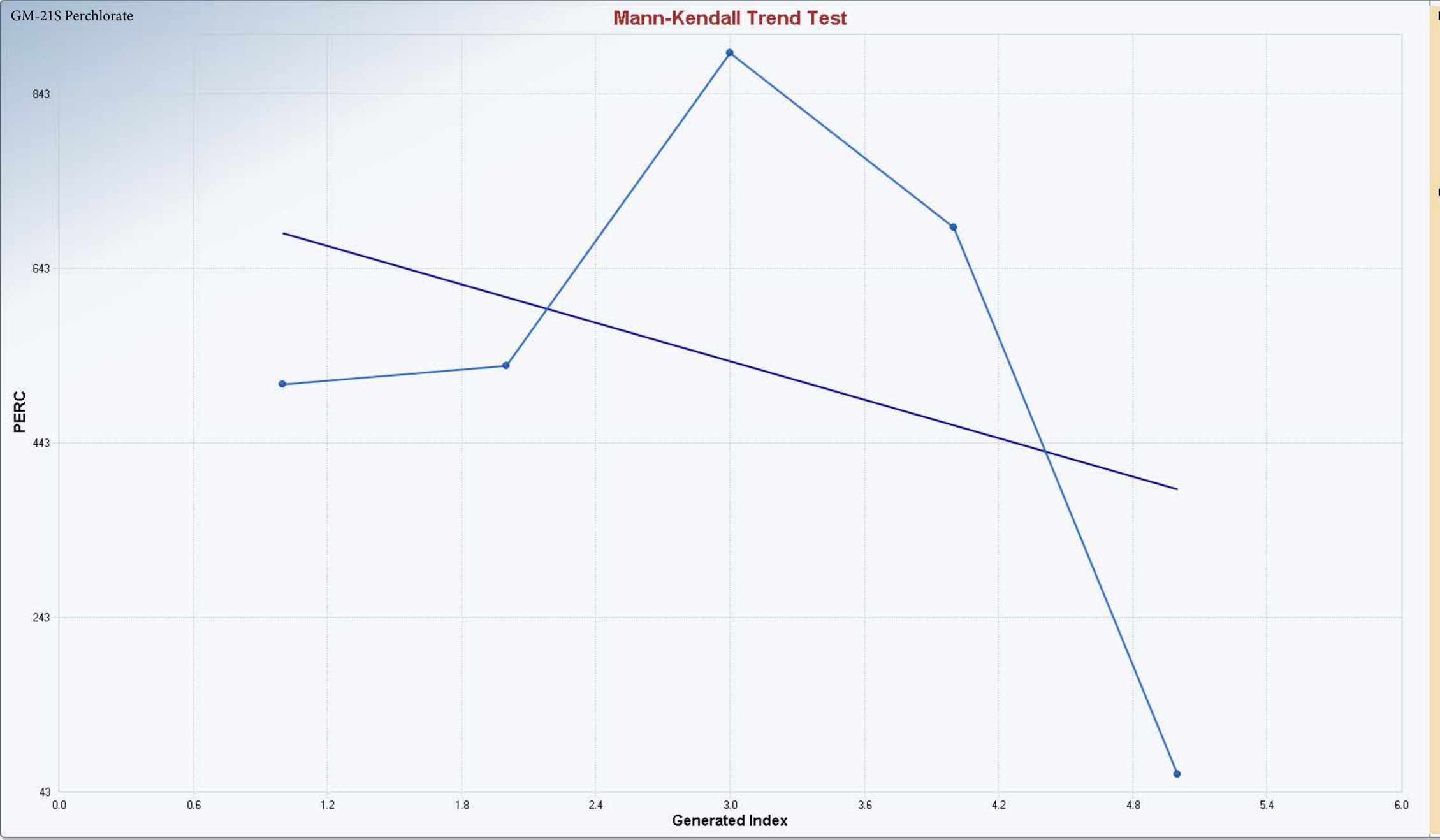
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	6
Number Values Missing	2
Number Values Used	4
Minimum	19
Maximum	120
Mean	51.75
Geometric Mean	38.46
Median	34
Standard Deviation	47.44
Coefficient of Variation	0.917

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	
M-K Test Value (S)	0
Tabulated p-value	0.5920
Approximate p-value	

OLS Regression Line (Blue)

OLS Regression Slope	-73.4000
OLS Regression Intercept	757.4000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:24:37 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

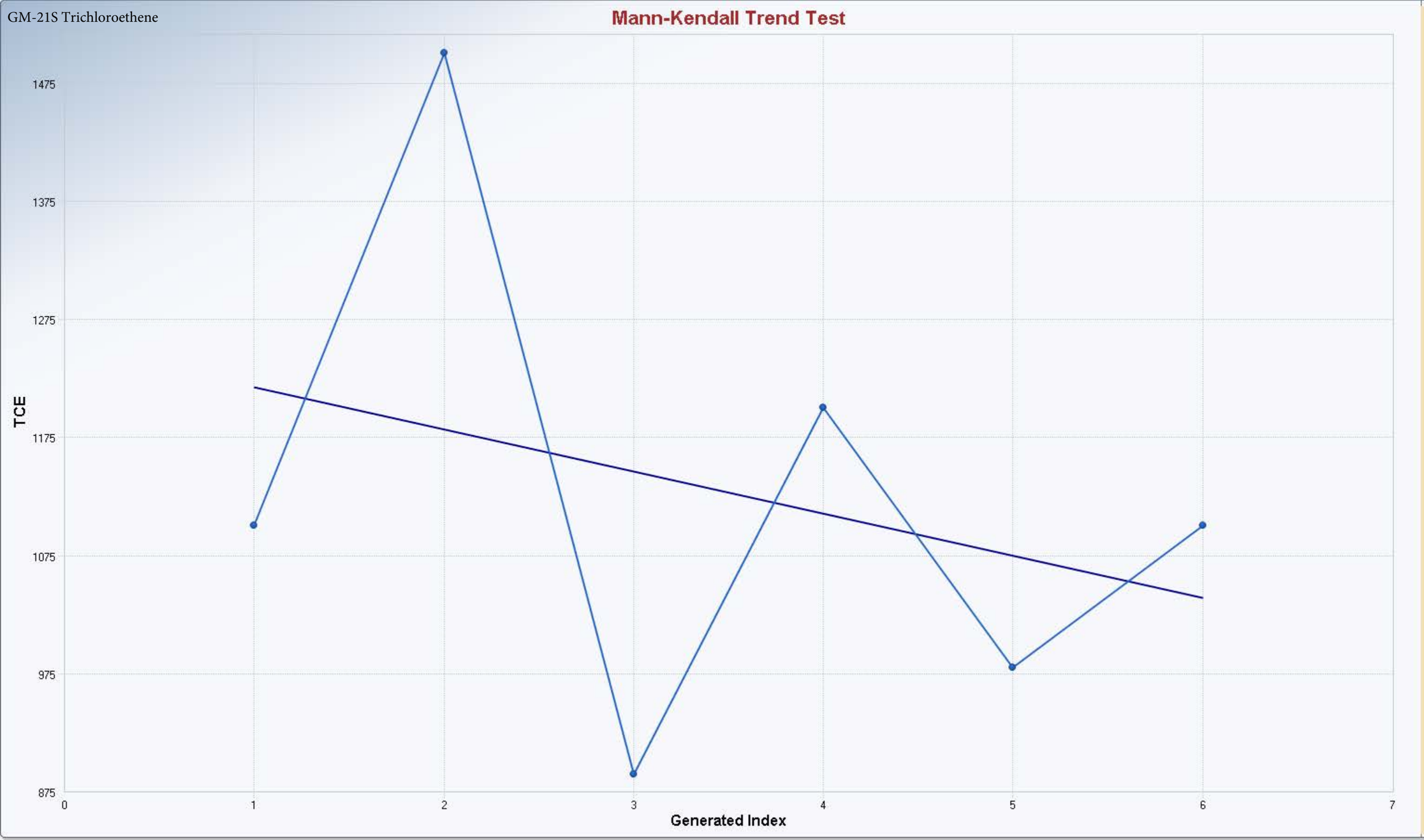
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	6
Number Values Missing	1
Number Values Used	5
Minimum	64
Maximum	890
Mean	537.2
Geometric Mean	403.3
Median	532
Standard Deviation	305.2
Coefficient of Variation	0.568

Mann-Kendall Test

M-K Test Value (S)	0
Tabulated p-value	0.592
Standard Deviation of S	4.082
Standardized Value of S	N/A
Approximate p-value	N/A

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-21S Trichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-0.1913
M-K Test Value (S)	-2
Tabulated p-value	0.3600
Approximate p-value	0.4242

OLS Regression Line (Blue)

OLS Regression Slope	-35.7143
OLS Regression Intercept	1,253.3333

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-21S Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:29:50 PM	
From File	GM-21S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

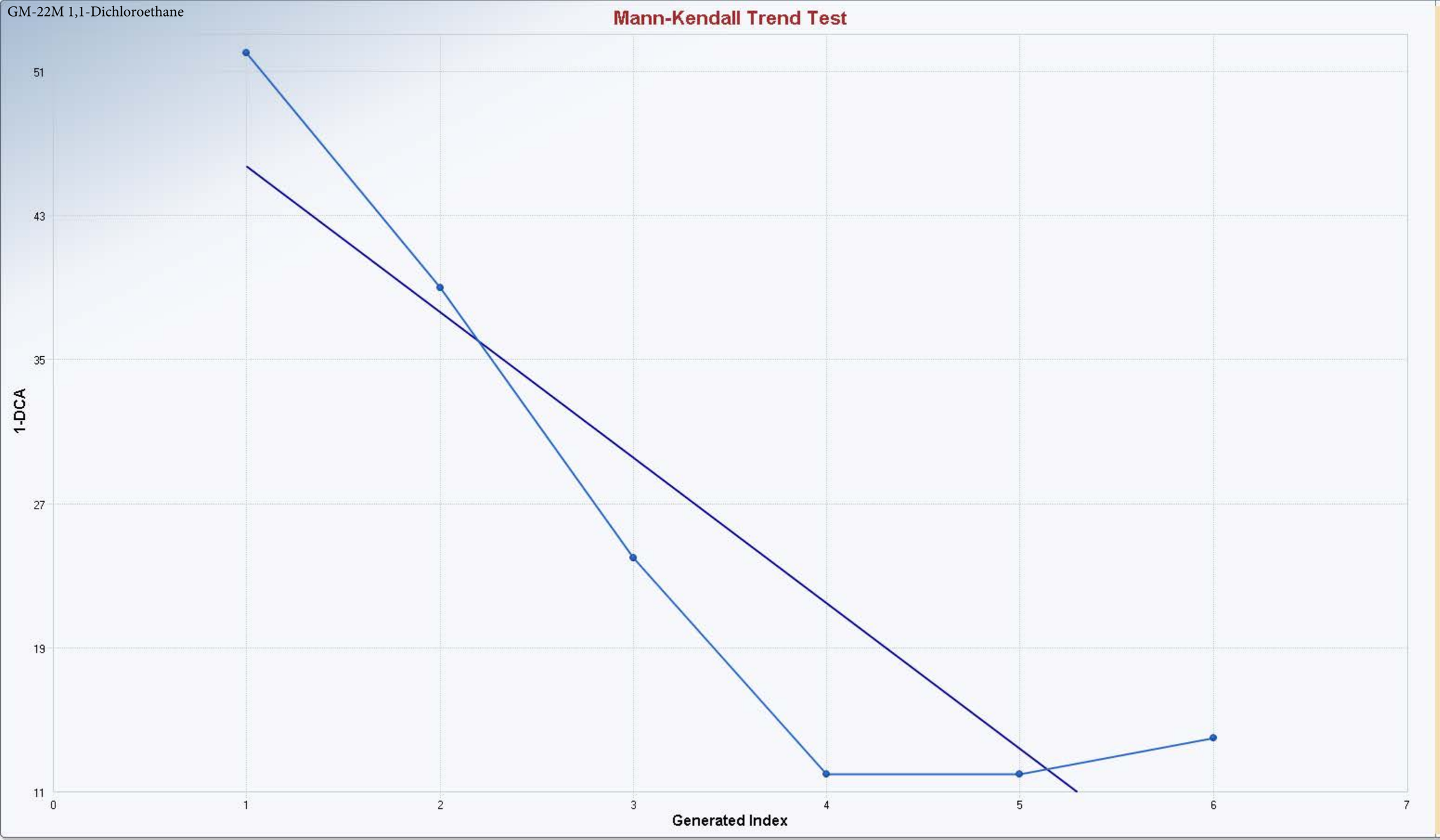
TCE

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	890
Maximum	1500
Mean	1128
Geometric Mean	1113
Median	1100
Standard Deviation	211.5
Coefficient of Variation	0.187

Mann-Kendall Test	
M-K Test Value (S)	-2
Tabulated p-value	0.36
Standard Deviation of S	5.228
Standardized Value of S	-0.191
Approximate p-value	0.424

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-22M 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-1.7215
M-K Test Value (S)	-10
Tabulated p-value	0.0280
Approximate p-value	0.0426

OLS Regression Line (Blue)

OLS Regression Slope	-8.0857
OLS Regression Intercept	53.8000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:44:31 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

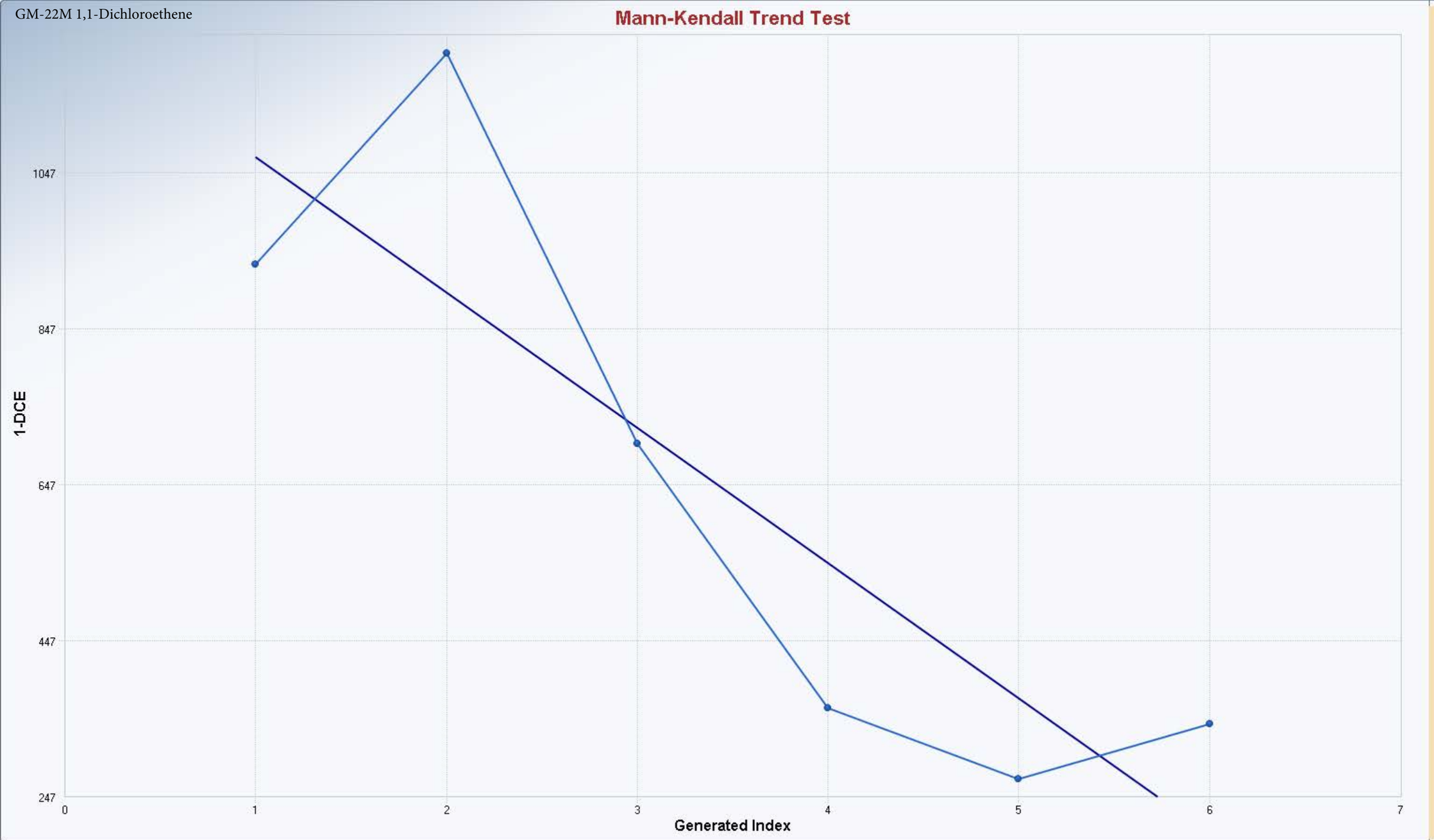
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	12
Maximum	52
Mean	25.5
Geometric Mean	21.48
Median	19
Standard Deviation	16.63
Coefficient of Variation	0.652

Mann-Kendall Test

M-K Test Value (S)	-10
Tabulated p-value	0.028
Standard Deviation of S	5.228
Standardized Value of S	-1.721
Approximate p-value	0.0426

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-1.8787
M-K Test Value (S)	-11
Tabulated p-value	0.0280
Approximate p-value	0.0301

OLS Regression Line (Blue)

OLS Regression Slope	-173.7143
OLS Regression Intercept	1,241.3333

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:45:22 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

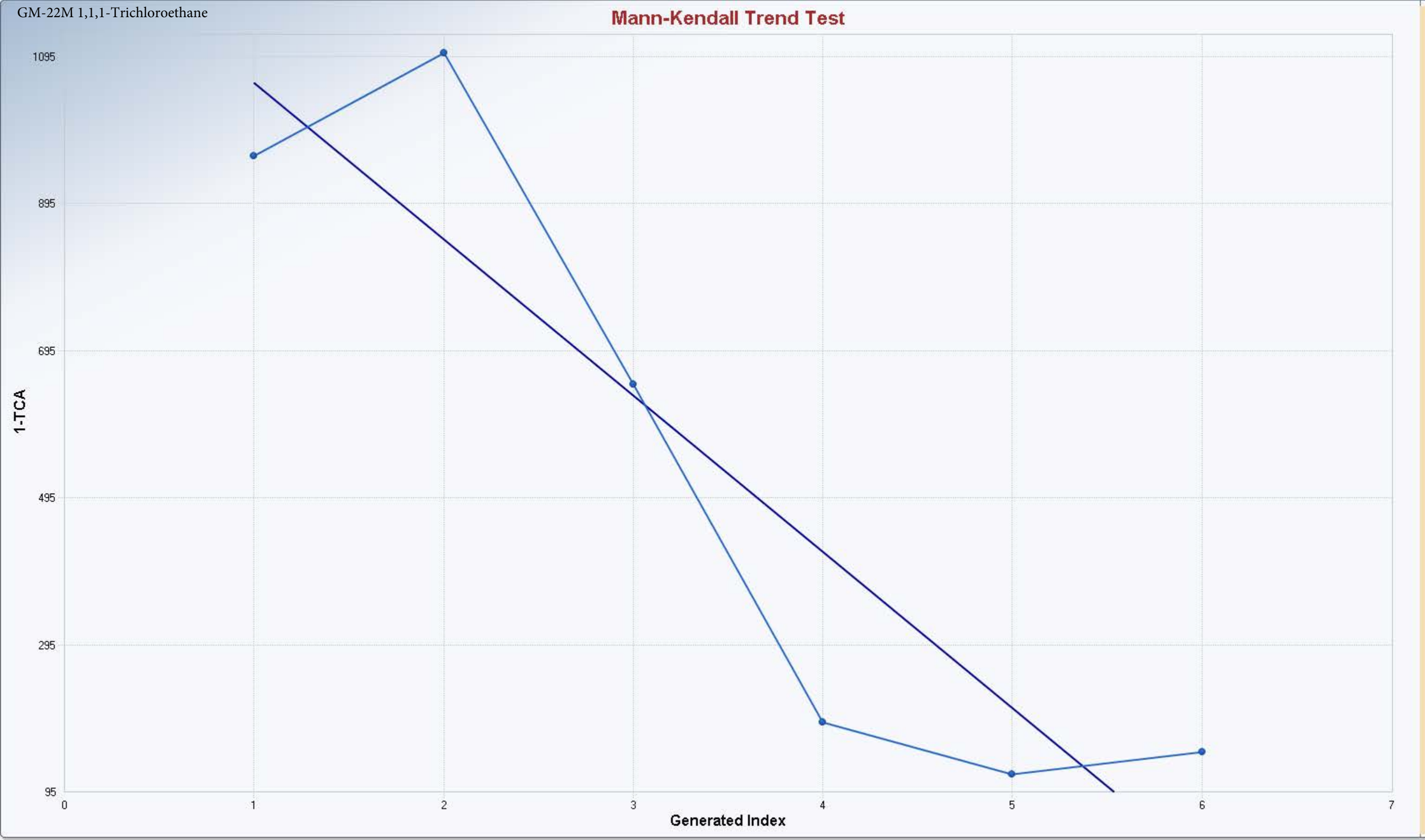
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	270
Maximum	1200
Mean	633.3
Geometric Mean	543.6
Median	530
Standard Deviation	375.9
Coefficient of Variation	0.593

Mann-Kendall Test

M-K Test Value (S)	-11
Tabulated p-value	0.028
Standard Deviation of S	5.323
Standardized Value of S	-1.879
Approximate p-value	0.0301

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-1.8787
M-K Test Value (S)	-11
Tabulated p-value	0.0280
Approximate p-value	0.0301

OLS Regression Line (Blue)

OLS Regression Slope	-212.8571
OLS Regression Intercept	1,273.3333

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:43:40 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

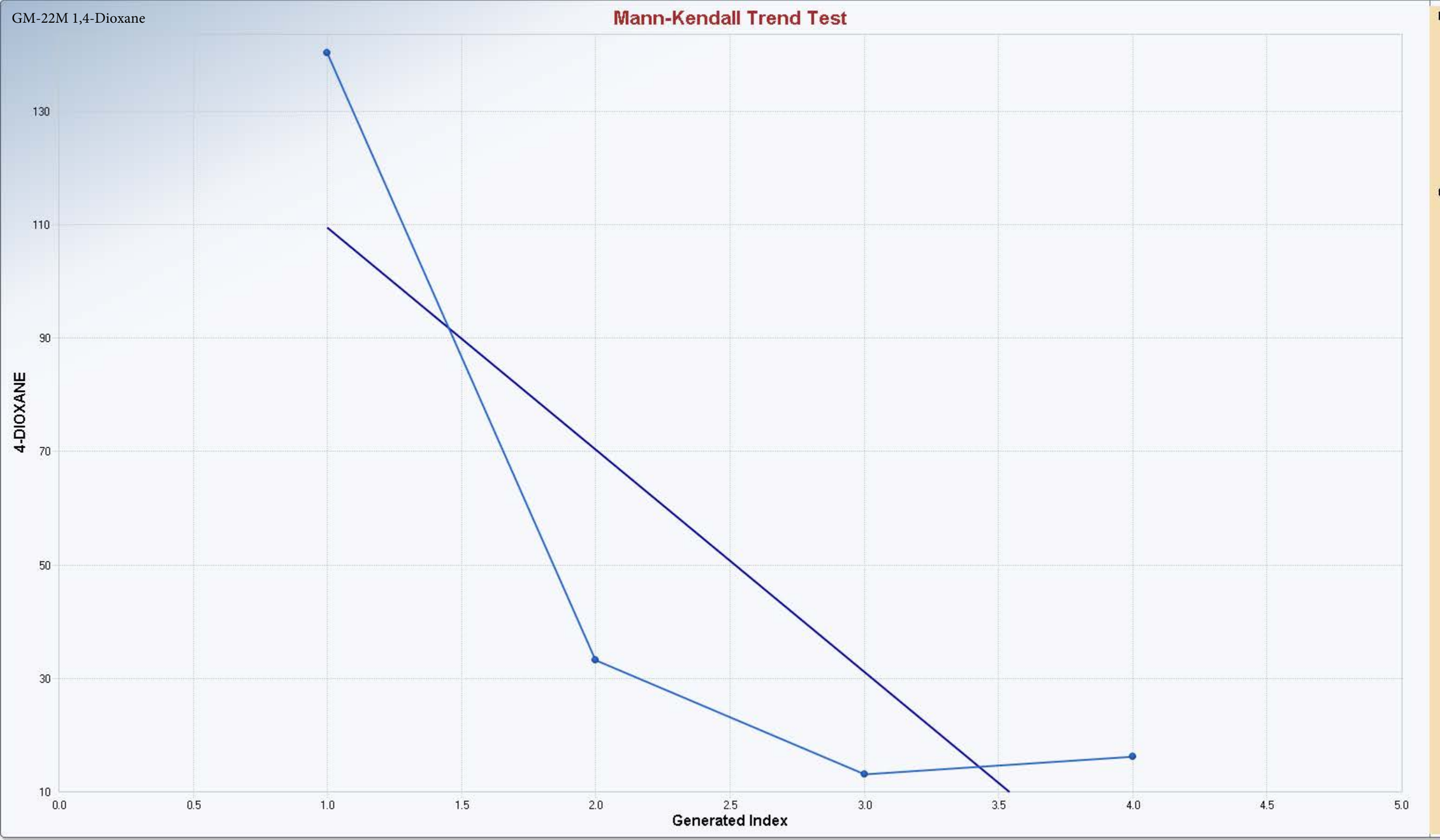
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	120
Maximum	1100
Mean	528.3
Geometric Mean	364.6
Median	420
Standard Deviation	436.4
Coefficient of Variation	0.826

Mann-Kendall Test

M-K Test Value (S)	-11
Tabulated p-value	0.028
Standard Deviation of S	5.323
Standardized Value of S	-1.879
Approximate p-value	0.0301

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)

OLS Regression Slope	-39.2000
OLS Regression Intercept	148.5000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-22M 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:42:44 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

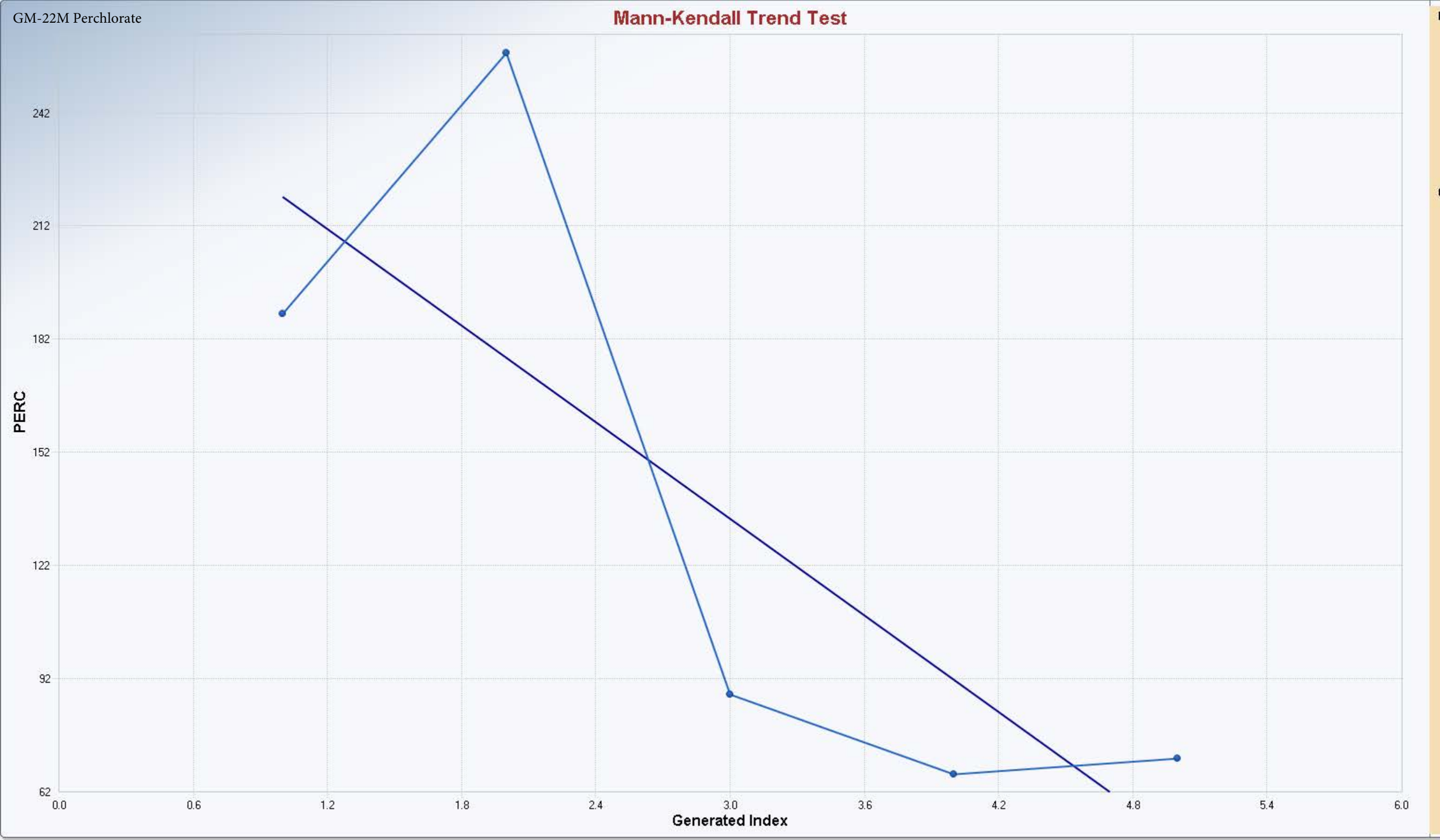
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	6
Number Values Missing	2
Number Values Used	4
Minimum	13
Maximum	140
Mean	50.5
Geometric Mean	31.31
Median	24.5
Standard Deviation	60.31
Coefficient of Variation	1.194

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.167
Standard Deviation of S	2.944
Standardized Value of S	-1.019
Approximate p-value	0.154

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-22M Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.2247
M-K Test Value (S)	-6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	-42.7000
OLS Regression Intercept	262.7000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-22M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:41:51 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

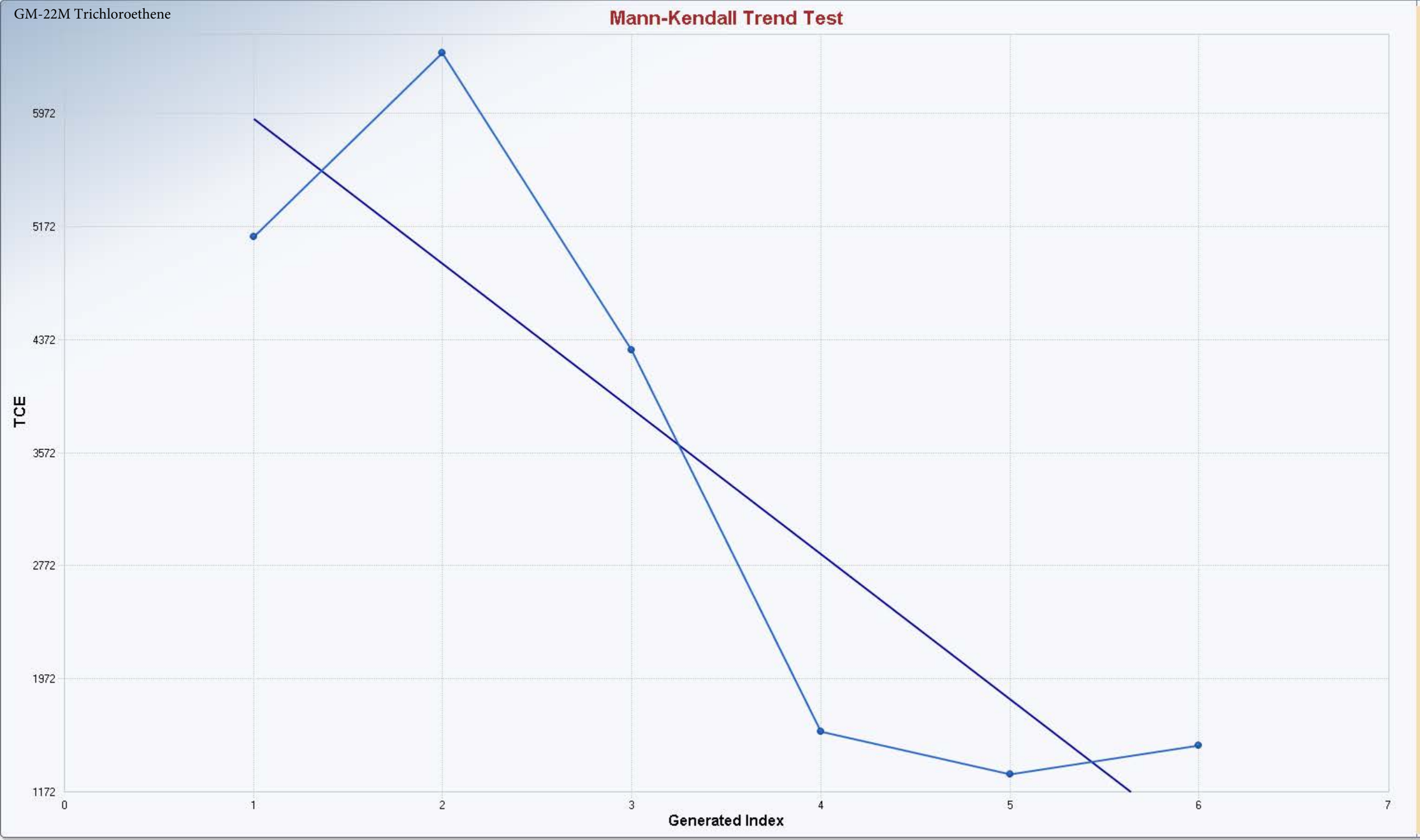
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	6
Number Values Missing	1
Number Values Used	5
Minimum	67
Maximum	258
Mean	134.6
Geometric Mean	115.3
Median	88
Standard Deviation	85.11
Coefficient of Variation	0.632

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	-1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-22M Trichloroethene



Mann-Kendall Trend Analysis

n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-1.8787
M-K Test Value (S)	-11
Tabulated p-value	0.0280
Approximate p-value	0.0301

OLS Regression Line (Blue)

OLS Regression Slope	-1,028.5714
OLS Regression Intercept	6,966.6667

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/4/2019 3:46:04 PM	
From File	GM-22M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

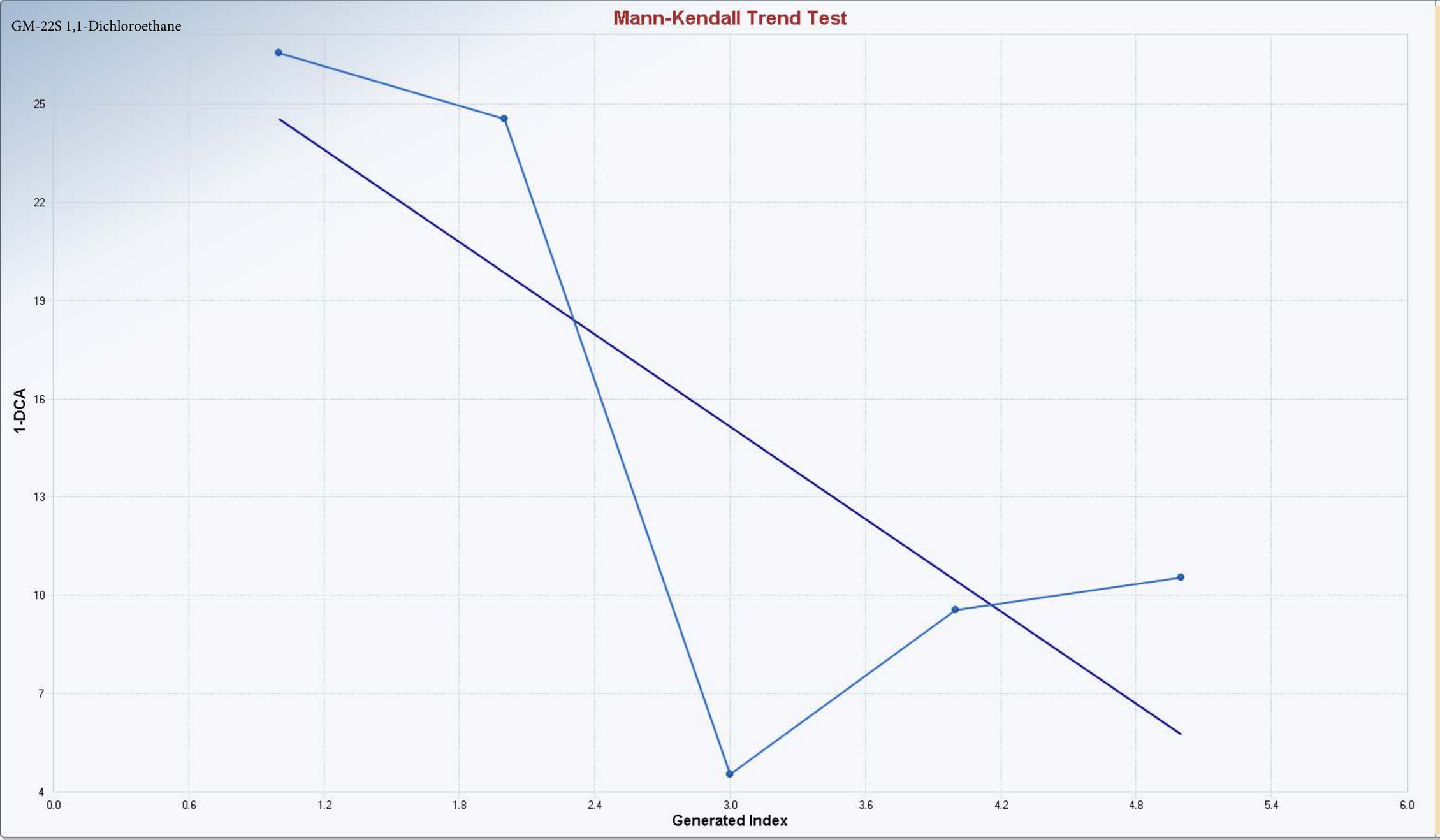
Number or Reported Events Not Used	0
Number of Generated Events	6
Number Values Reported (n)	6
Minimum	1300
Maximum	6400
Mean	3367
Geometric Mean	2756
Median	2950
Standard Deviation	2189
Coefficient of Variation	0.65

Mann-Kendall Test

M-K Test Value (S)	-11
Tabulated p-value	0.028
Standard Deviation of S	5.323
Standardized Value of S	-1.879
Approximate p-value	0.0301

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S 1,1-Dichloroethane



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-0.7348
M-K Test Value (S)	-4
Tabulated p-value	0.2420
Approximate p-value	0.2312

OLS Regression Line (Blue)

OLS Regression Slope	-4.7000
OLS Regression Intercept	29.7000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-22S 1,1-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 9:58:07 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCA

General Statistics

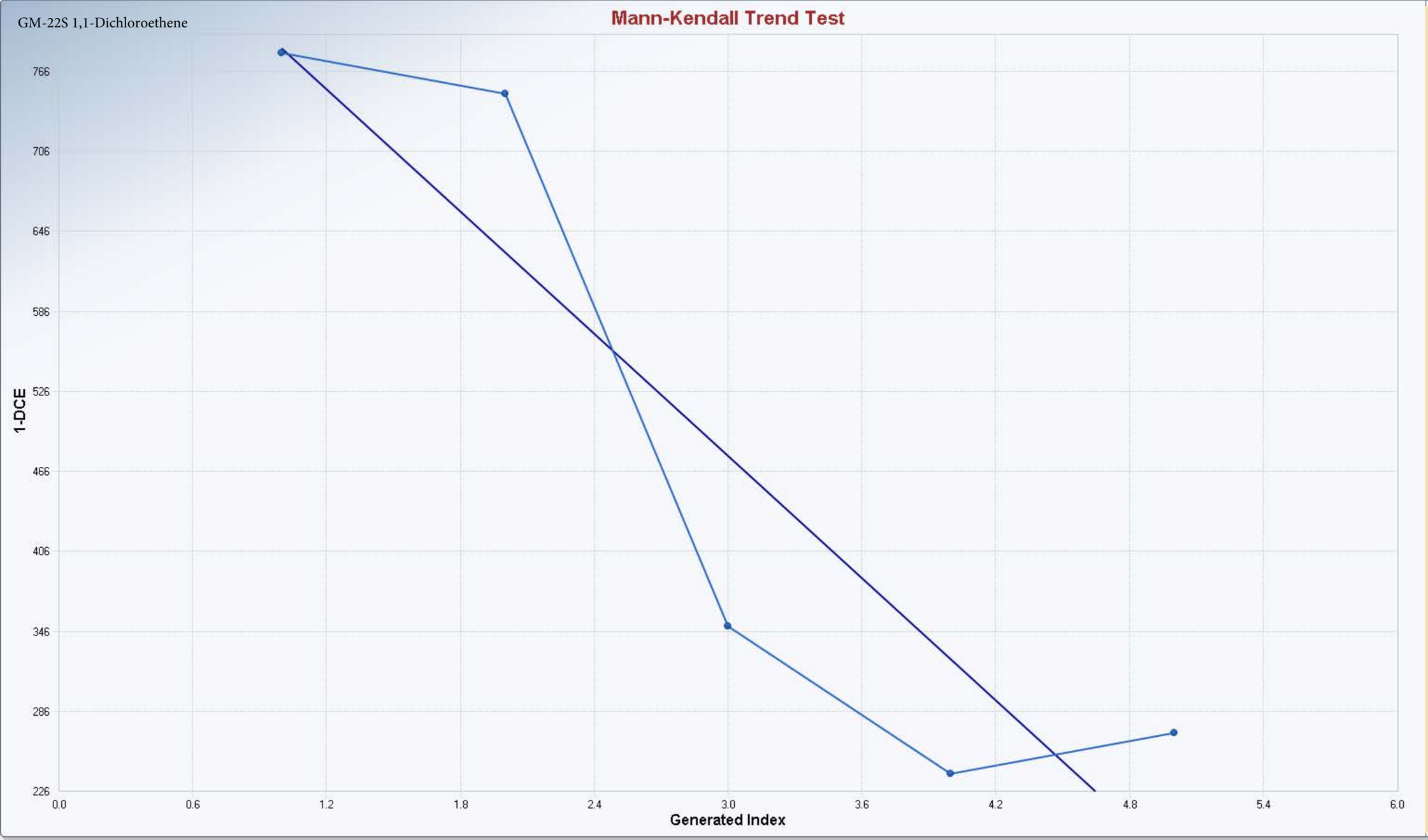
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	5
Maximum	27
Mean	15.6
Geometric Mean	13
Median	11
Standard Deviation	9.788
Coefficient of Variation	0.627

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.242
Standard Deviation of S	4.082
Standardized Value of S	-0.735
Approximate p-value	0.231

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-22S 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-153.0000
OLS Regression Intercept	937.0000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 9:59:39 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	240
Maximum	780
Mean	478
Geometric Mean	421.3
Median	350
Standard Deviation	265.3
Coefficient of Variation	0.555

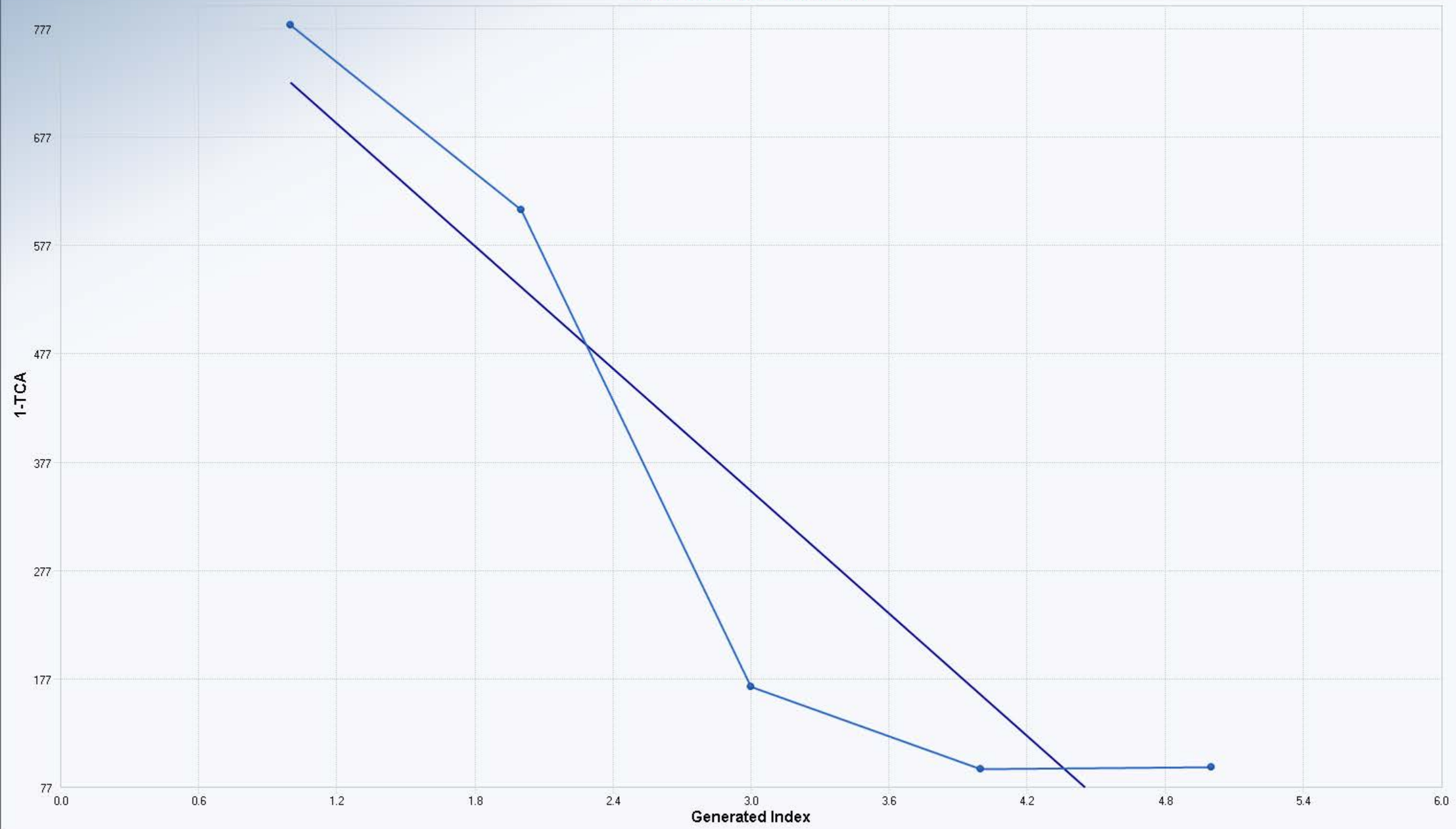
Mann-Kendall Test

M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-188.6000
OLS Regression Intercept	915.6000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 9:56:20 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

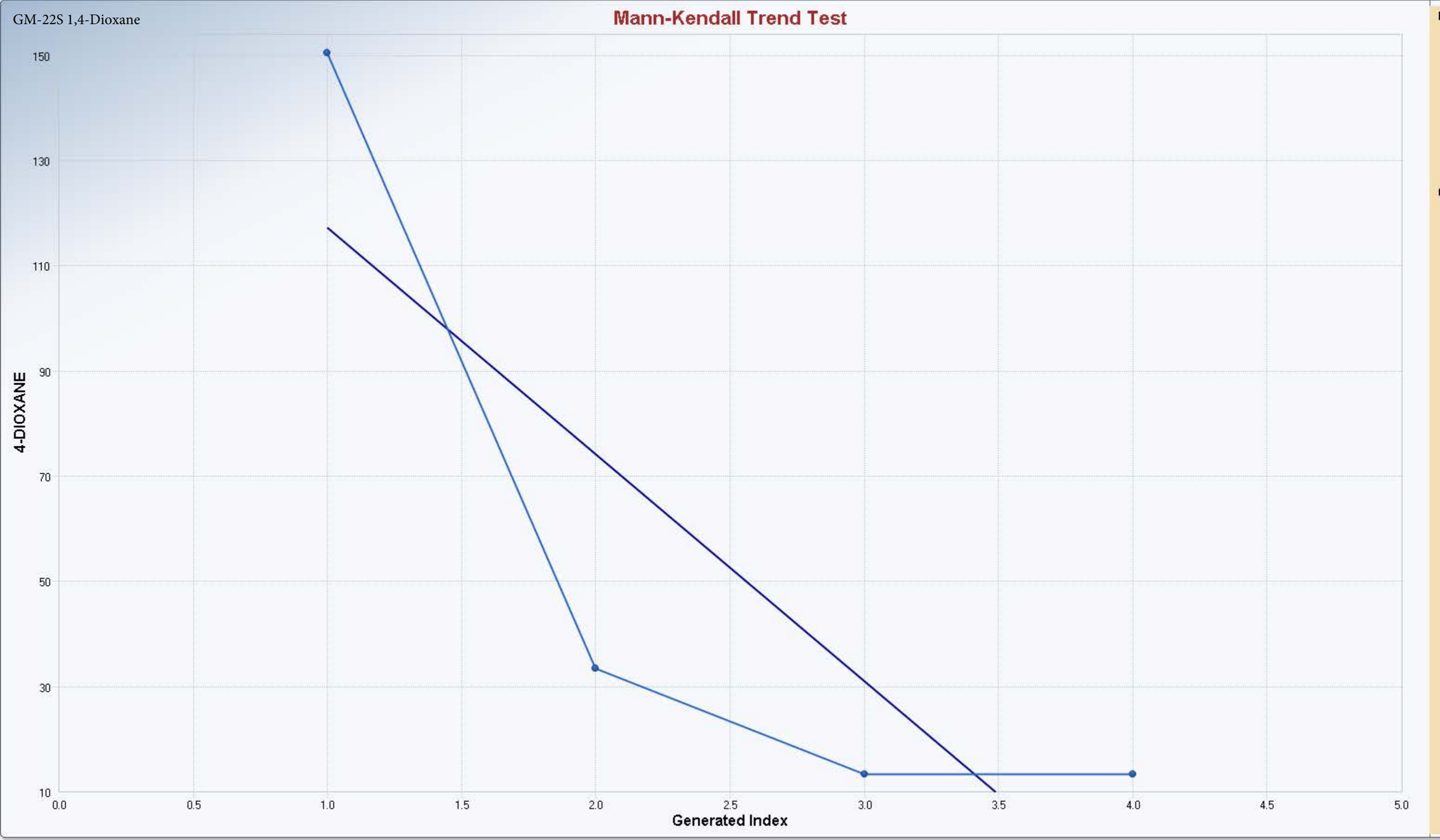
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	94
Maximum	780
Mean	349.8
Geometric Mean	235.4
Median	170
Standard Deviation	322.3
Coefficient of Variation	0.921

Mann-Kendall Test

M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S 1,4-Dioxane



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.7689
Standardized Value of S	-1.4446
M-K Test Value (S)	-5
Tabulated p-value	0.1670
Approximate p-value	0.0743

OLS Regression Line (Blue)

OLS Regression Slope	-43.1000
OLS Regression Intercept	160.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-22S 1,4-Dioxane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 9:54:43 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

4-DIOXANE

General Statistics

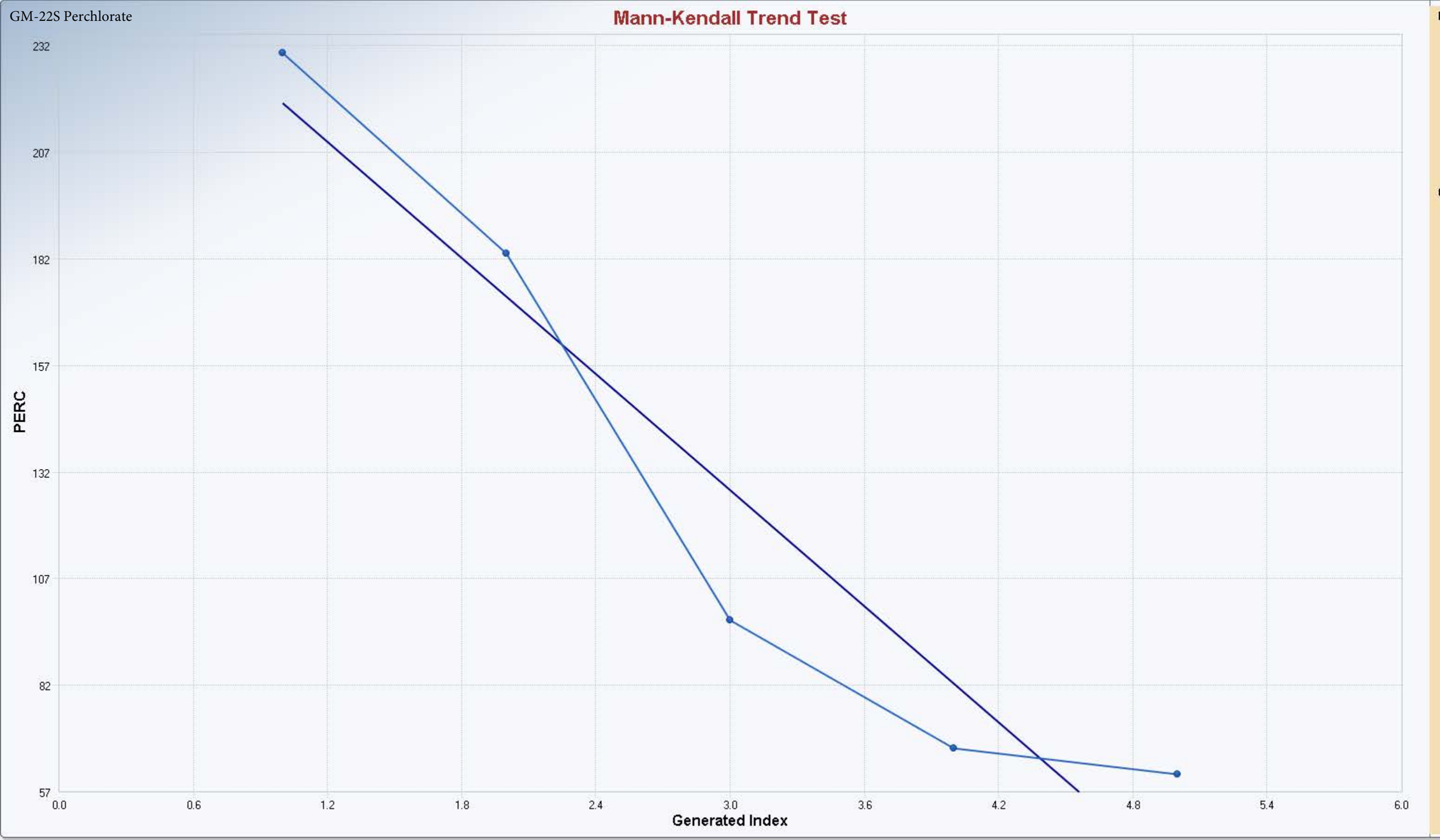
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	13
Maximum	150
Mean	52.25
Geometric Mean	30.24
Median	23
Standard Deviation	65.85
Coefficient of Variation	1.26

Mann-Kendall Test

M-K Test Value (S)	-5
Tabulated p-value	0.167
Standard Deviation of S	2.769
Standardized Value of S	-1.445
Approximate p-value	0.0743

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-22S Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-2.2045
M-K Test Value (S)	-10
Tabulated p-value	0.0080
Approximate p-value	0.0137

OLS Regression Line (Blue)

OLS Regression Slope	-45.4000
OLS Regression Intercept	263.8000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 9:53:00 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

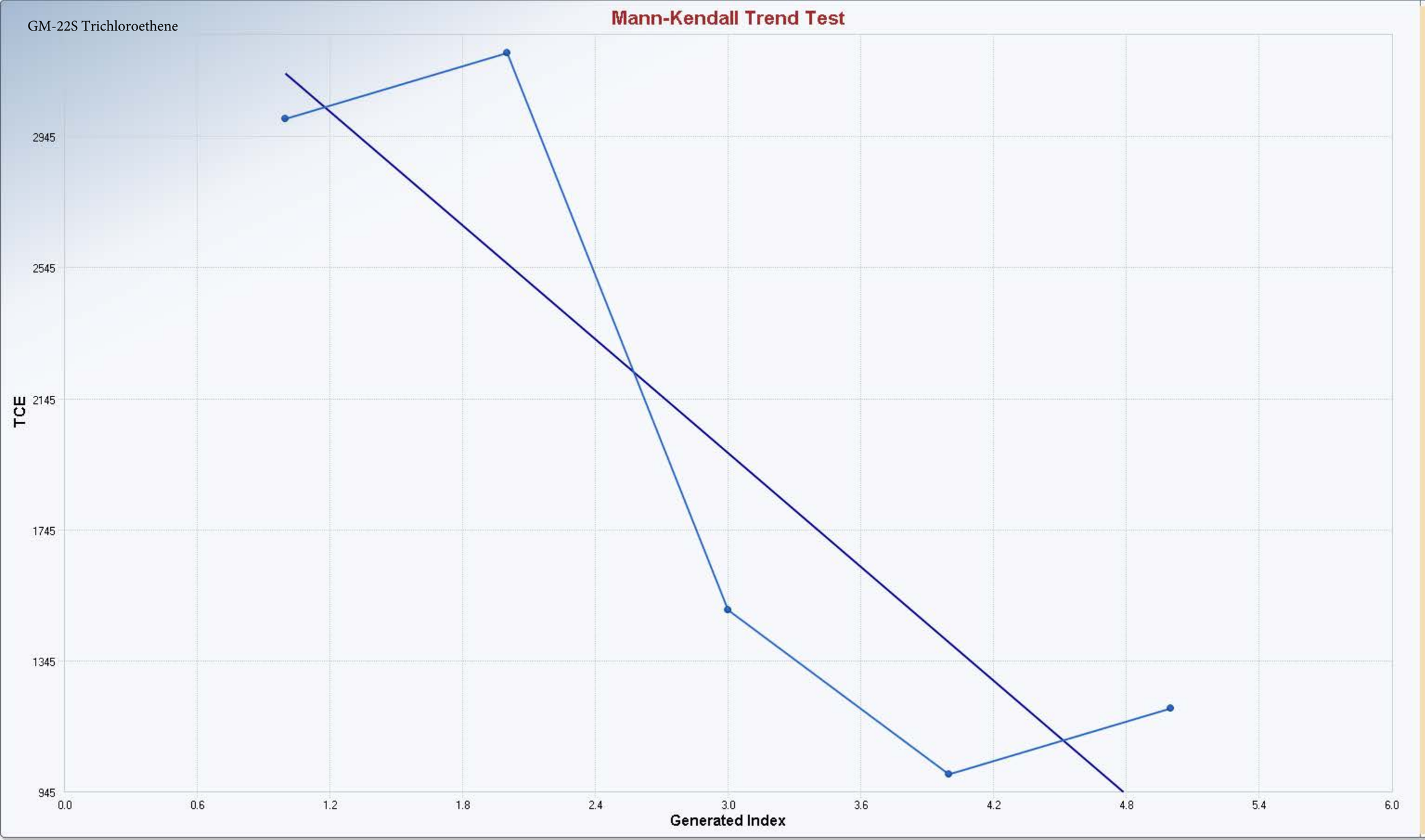
PERC

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	61
Maximum	230
Mean	127.6
Geometric Mean	110.8
Median	97
Standard Deviation	75.17
Coefficient of Variation	0.589

Mann-Kendall Test	
M-K Test Value (S)	-10
Tabulated p-value	0.008
Standard Deviation of S	4.082
Standardized Value of S	-2.205
Approximate p-value	0.0137

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-22S Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.2247
M-K Test Value (S)	-6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	-580.0000
OLS Regression Intercept	3,720.0000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-22S Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:00:53 AM	
From File	GM-22S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

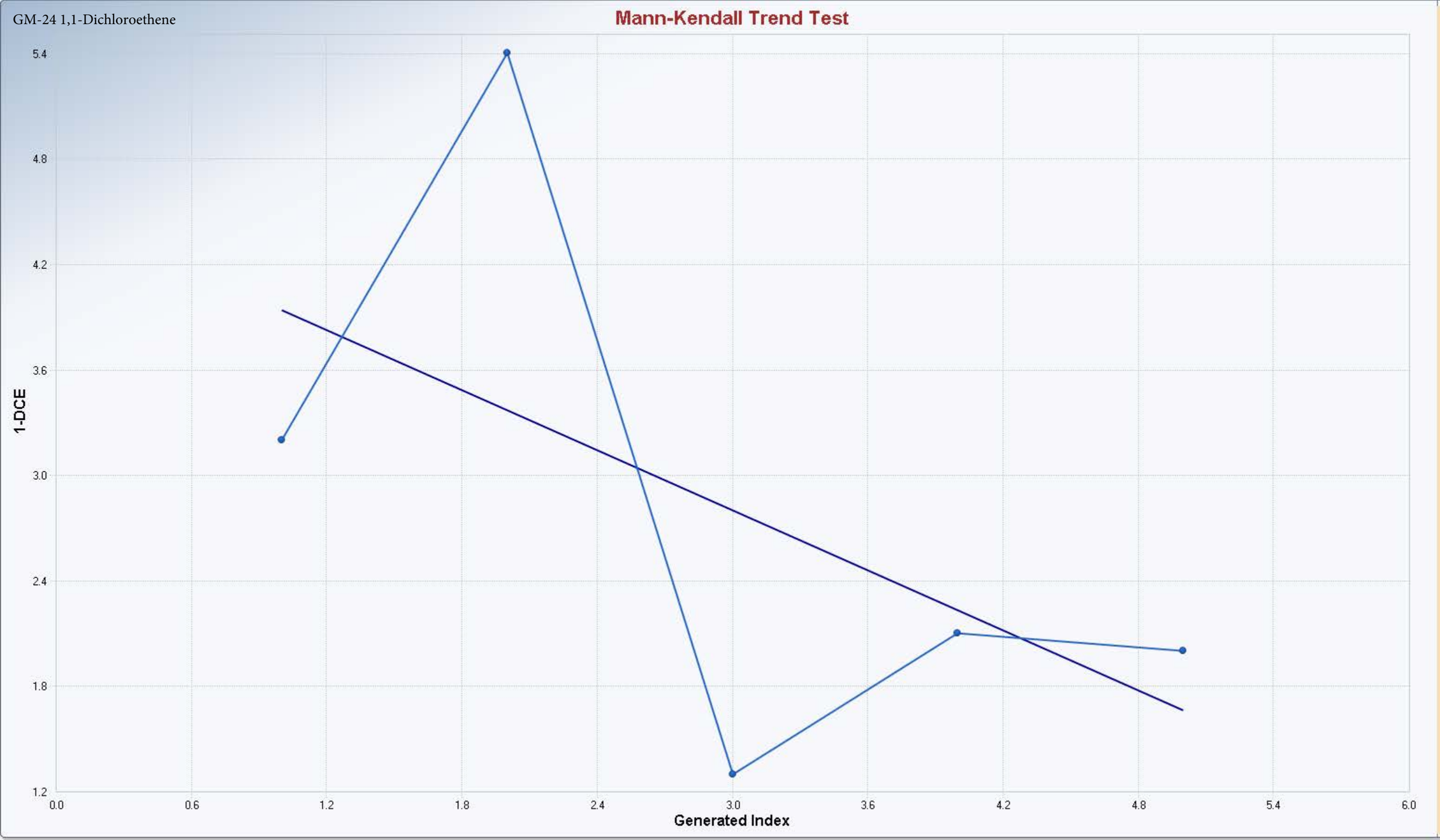
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	1000
Maximum	3200
Mean	1980
Geometric Mean	1768
Median	1500
Standard Deviation	1040
Coefficient of Variation	0.525

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	-1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-24 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-0.7348
M-K Test Value (S)	-4
Tabulated p-value	0.2420
Approximate p-value	0.2312

OLS Regression Line (Blue)

OLS Regression Slope	-0.5700
OLS Regression Intercept	4.5100

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-24 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:07:20 AM	
From File	GM-24.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

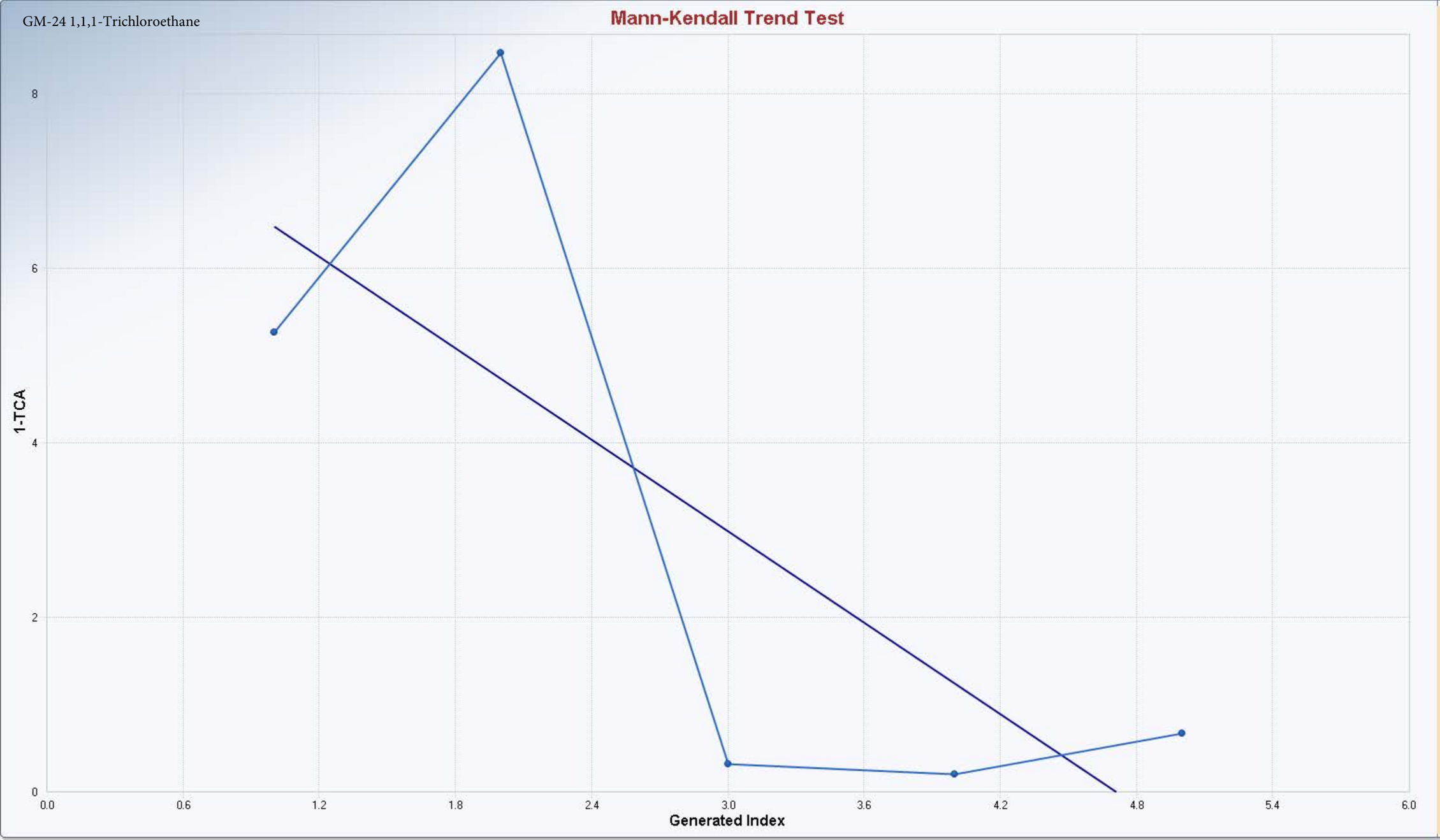
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	1.3
Maximum	5.4
Mean	2.8
Geometric Mean	2.483
Median	2.1
Standard Deviation	1.605
Coefficient of Variation	0.573

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.242
Standard Deviation of S	4.082
Standardized Value of S	-0.735
Approximate p-value	0.231

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-24 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-0.7348
M-K Test Value (S)	-4
Tabulated p-value	0.2420
Approximate p-value	0.2312

OLS Regression Line (Blue)

OLS Regression Slope	-1.7460
OLS Regression Intercept	8.5560

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-24 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:05:56 AM	
From File	GM-24.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

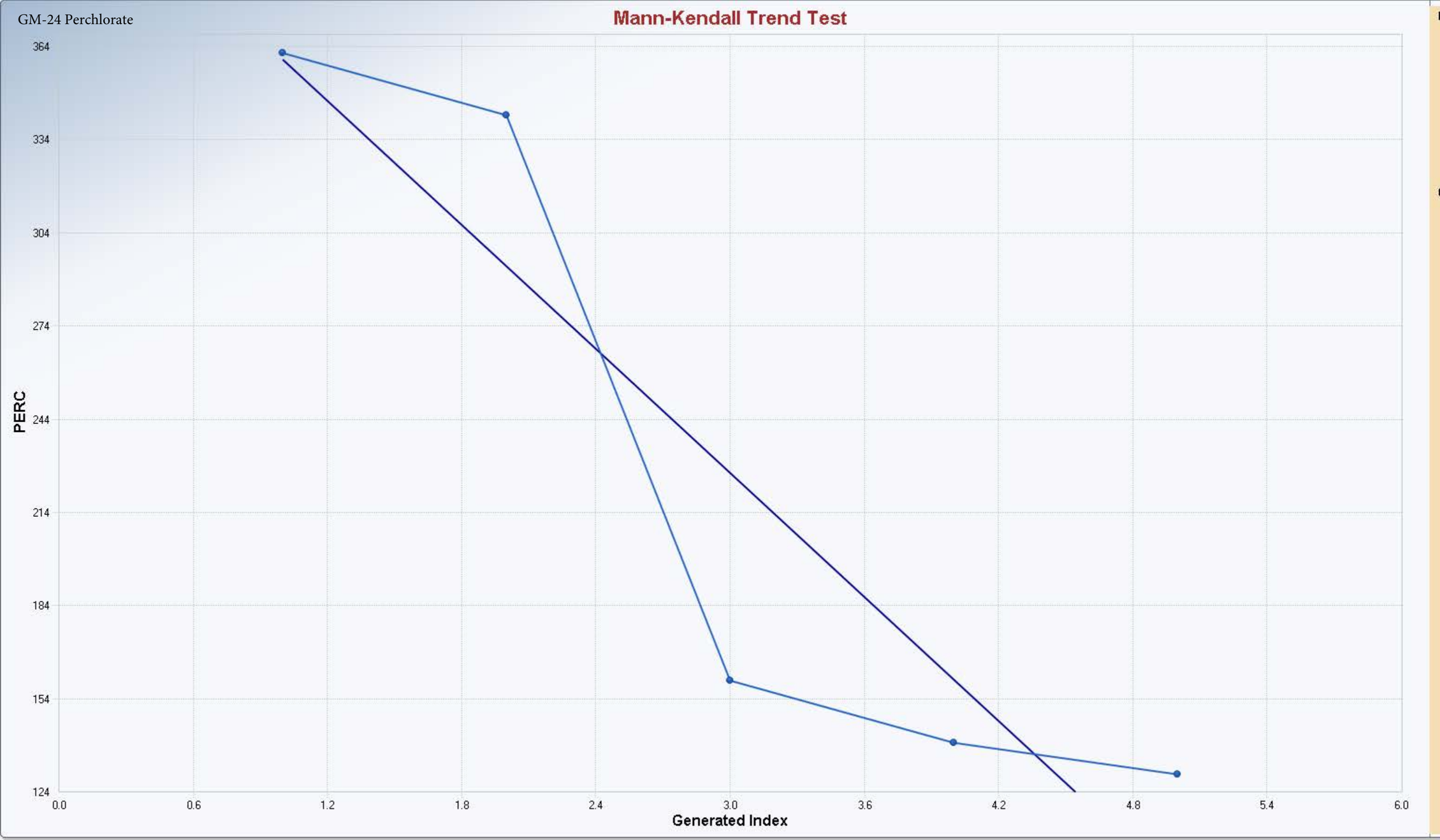
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	0.54
Maximum	8.8
Mean	3.318
Geometric Mean	1.768
Median	1
Standard Deviation	3.724
Coefficient of Variation	1.122

Mann-Kendall Test

M-K Test Value (S)	-4
Tabulated p-value	0.242
Standard Deviation of S	4.082
Standardized Value of S	-0.735
Approximate p-value	0.231

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-24 Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-2.2045
M-K Test Value (S)	-10
Tabulated p-value	0.0080
Approximate p-value	0.0137

OLS Regression Line (Blue)

OLS Regression Slope	-66.6000
OLS Regression Intercept	426.6000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-24 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:04:17 AM	
From File	GM-24.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

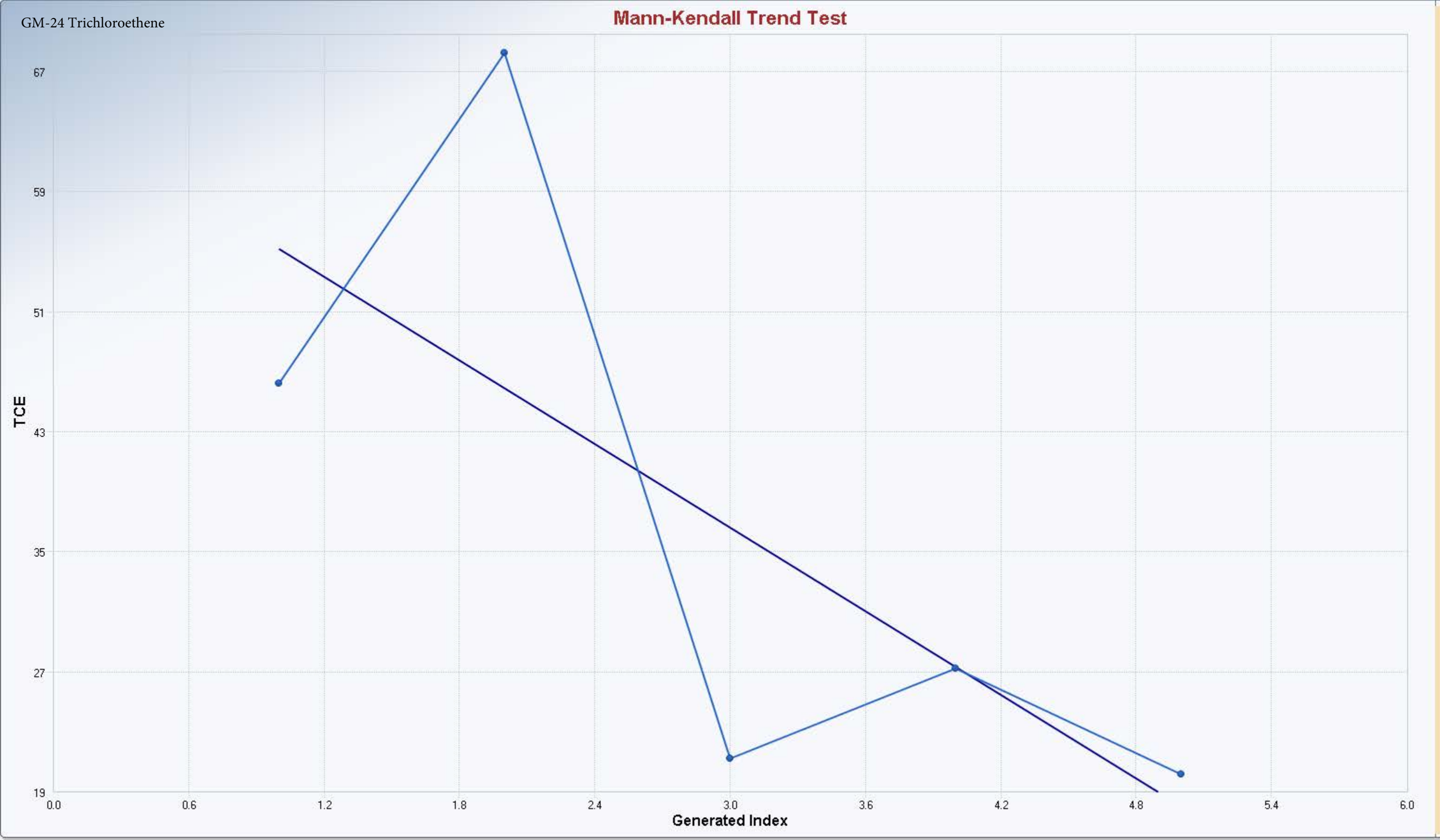
PERC

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	130
Maximum	362
Mean	226.8
Geometric Mean	204.8
Median	160
Standard Deviation	115
Coefficient of Variation	0.507

Mann-Kendall Test	
M-K Test Value (S)	-10
Tabulated p-value	0.008
Standard Deviation of S	4.082
Standardized Value of S	-2.205
Approximate p-value	0.0137

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-24 Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.2247
M-K Test Value (S)	-6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	-9.3000
OLS Regression Intercept	64.3000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-24 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:08:33 AM	
From File	GM-24.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

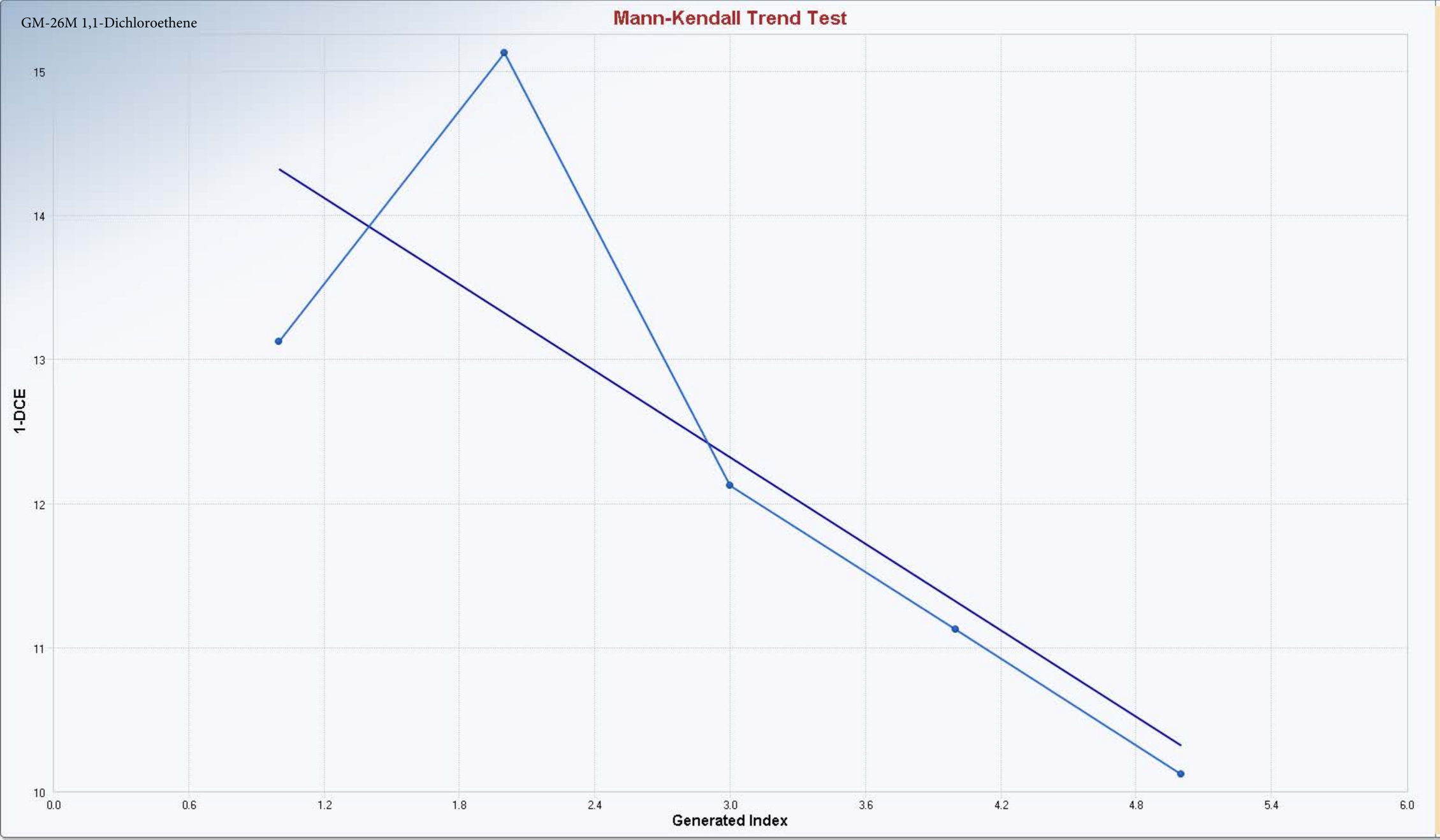
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	20
Maximum	68
Mean	36.4
Geometric Mean	32.36
Median	27
Standard Deviation	20.53
Coefficient of Variation	0.564

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	-1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-26M 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-1.0000
OLS Regression Intercept	15.2000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26M 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:13:13 AM	
From File	GM-26M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	10
Maximum	15
Mean	12.2
Geometric Mean	12.08
Median	12
Standard Deviation	1.924
Coefficient of Variation	0.158

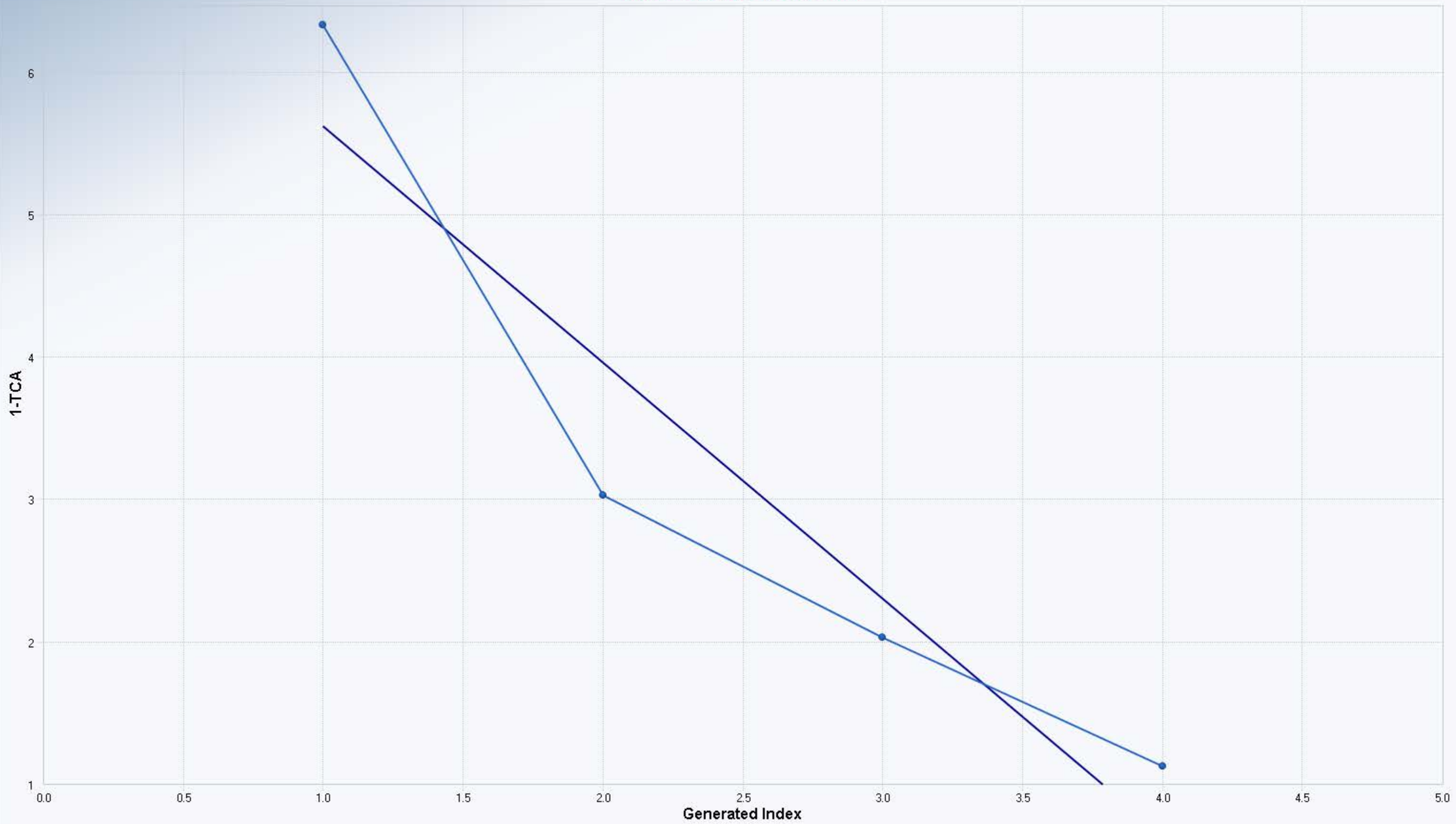
Mann-Kendall Test

M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26M 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.6984
M-K Test Value (S)	-6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)

OLS Regression Slope	-1.6600
OLS Regression Intercept	7.1500

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26M 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:11:56 AM	
From File	GM-26M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

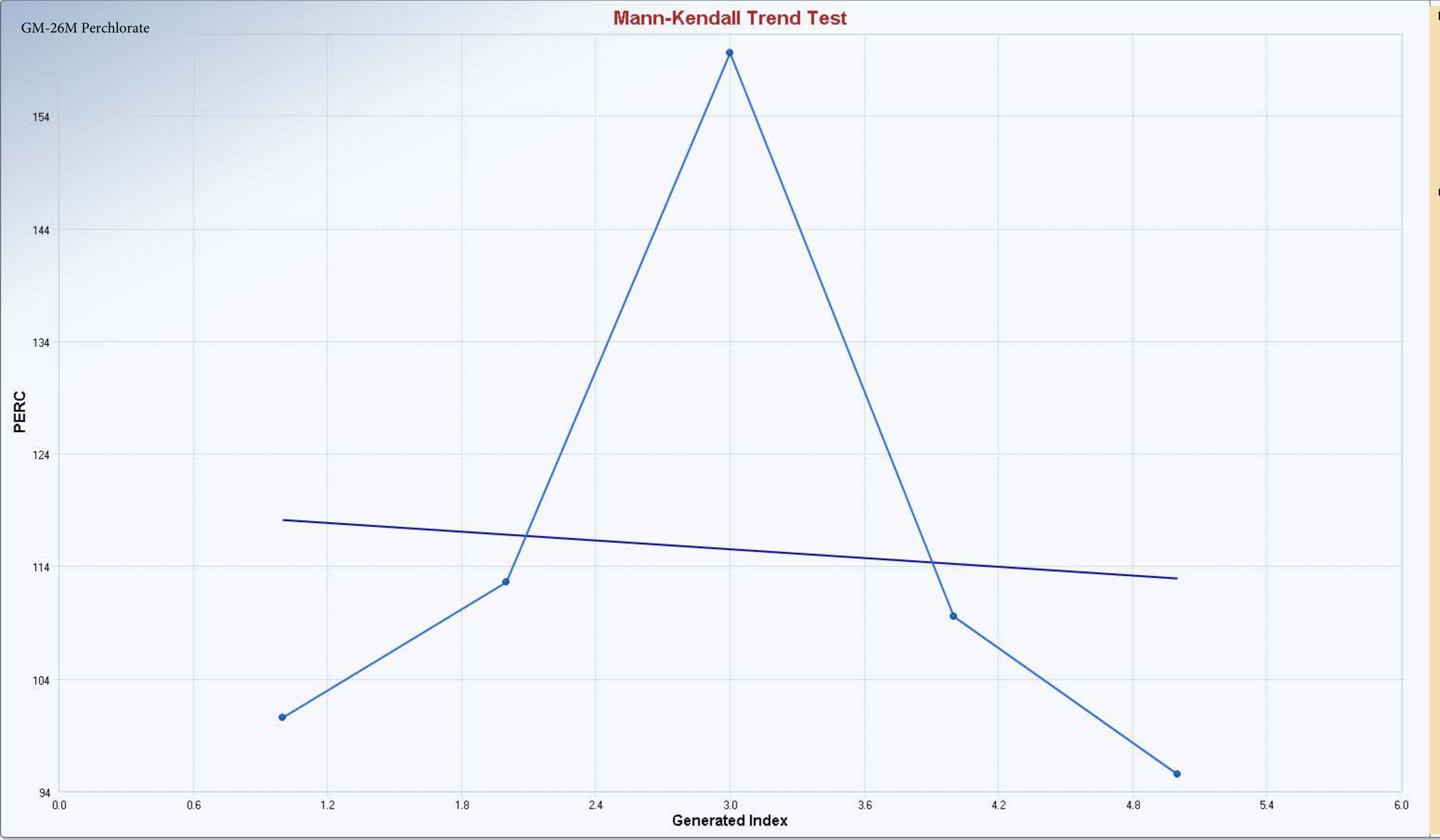
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	1
Maximum	6.2
Mean	3
Geometric Mean	2.418
Median	2.4
Standard Deviation	2.27
Coefficient of Variation	0.757

Mann-Kendall Test

M-K Test Value (S)	-6
Tabulated p-value	0.042
Standard Deviation of S	2.944
Standardized Value of S	-1.698
Approximate p-value	0.0447

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26M Perchlorate



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-0.2449
M-K Test Value (S)	-2
Tabulated p-value	0.4080
Approximate p-value	0.4032

OLS Regression Line (Blue)

OLS Regression Slope	-1.3000
OLS Regression Intercept	119.9000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-26M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:10:39 AM	
From File	GM-26M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

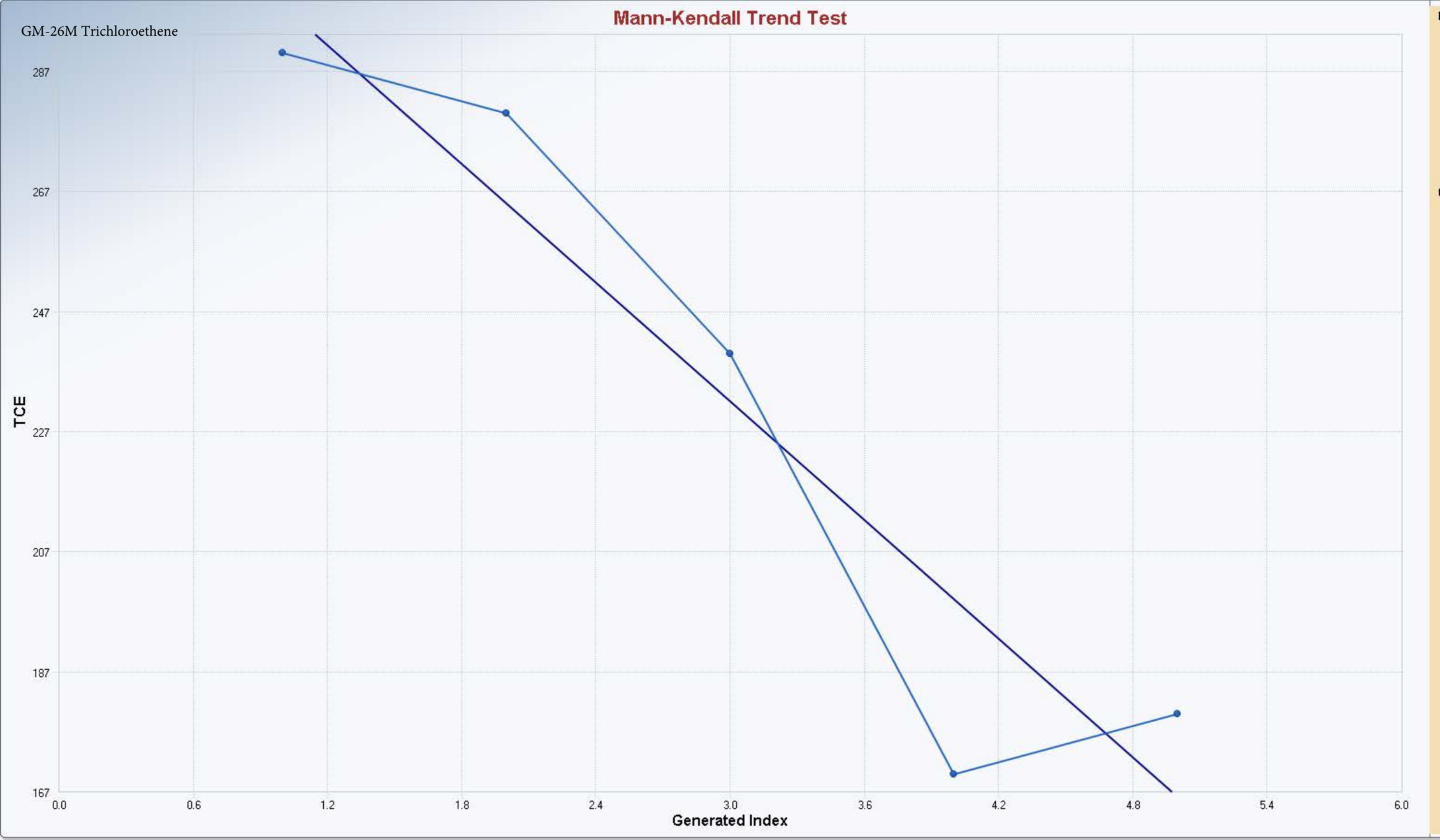
PERC

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	96
Maximum	160
Mean	116
Geometric Mean	114
Median	110
Standard Deviation	25.52
Coefficient of Variation	0.22

Mann-Kendall Test	
M-K Test Value (S)	-2
Tabulated p-value	0.408
Standard Deviation of S	4.082
Standardized Value of S	-0.245
Approximate p-value	0.403

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-26M Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-1.7146
M-K Test Value (S)	-8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	-33.0000
OLS Regression Intercept	331.0000

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:14:34 AM	
From File	GM-26M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	170
Maximum	290
Mean	232
Geometric Mean	226.5
Median	240
Standard Deviation	55.41
Coefficient of Variation	0.239

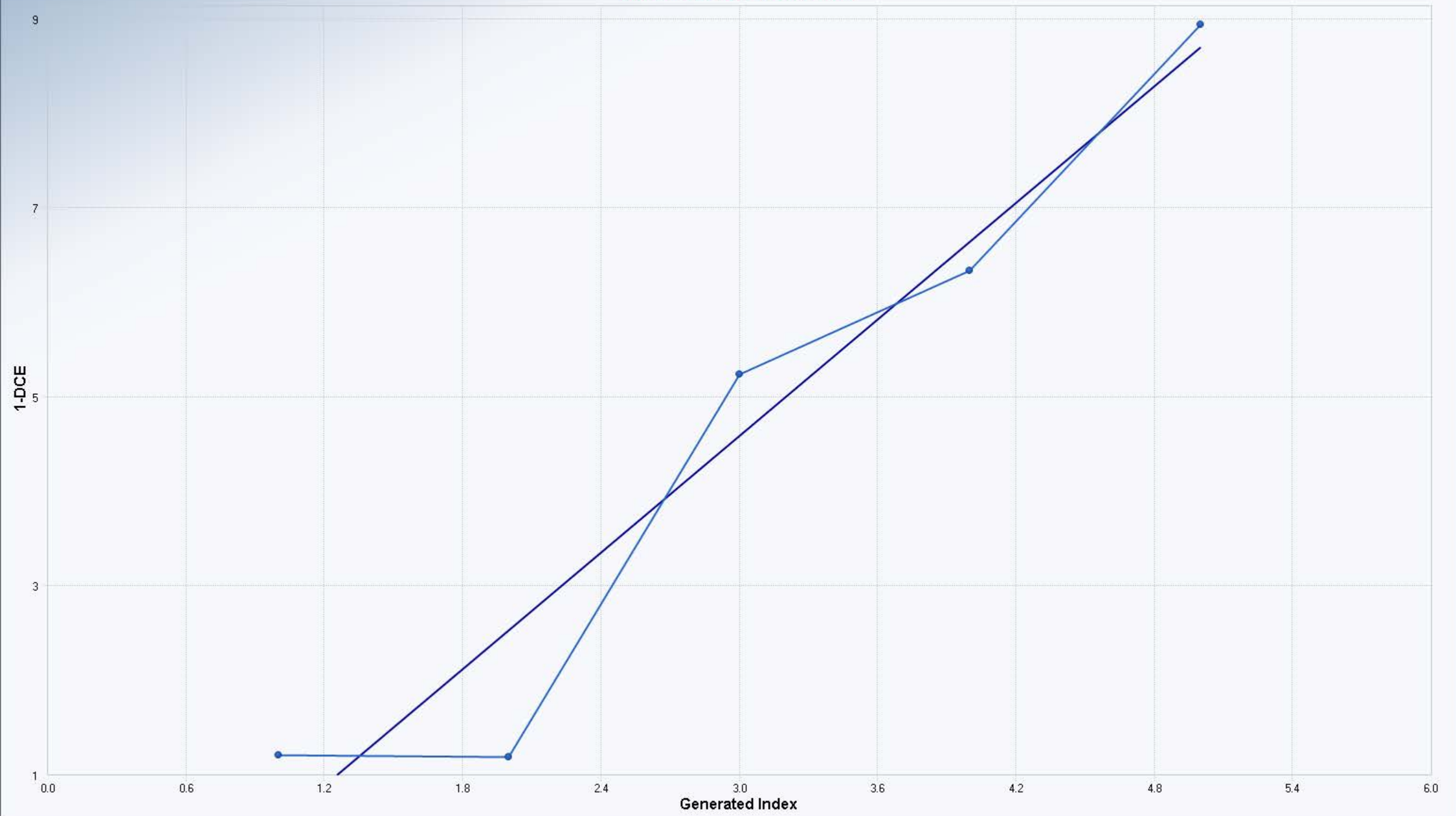
Mann-Kendall Test

M-K Test Value (S)	-8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	-1.715
Approximate p-value	0.0432

Statistically significant evidence of a decreasing trend at the specified level of significance.

GM-26S 1,1-Dichloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	1.7146
M-K Test Value (S)	8
Tabulated p-value	0.0420
Approximate p-value	0.0432

OLS Regression Line (Blue)

OLS Regression Slope	2.0580
OLS Regression Intercept	-1.9260

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-26S 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:18:48 AM	
From File	GM-26S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

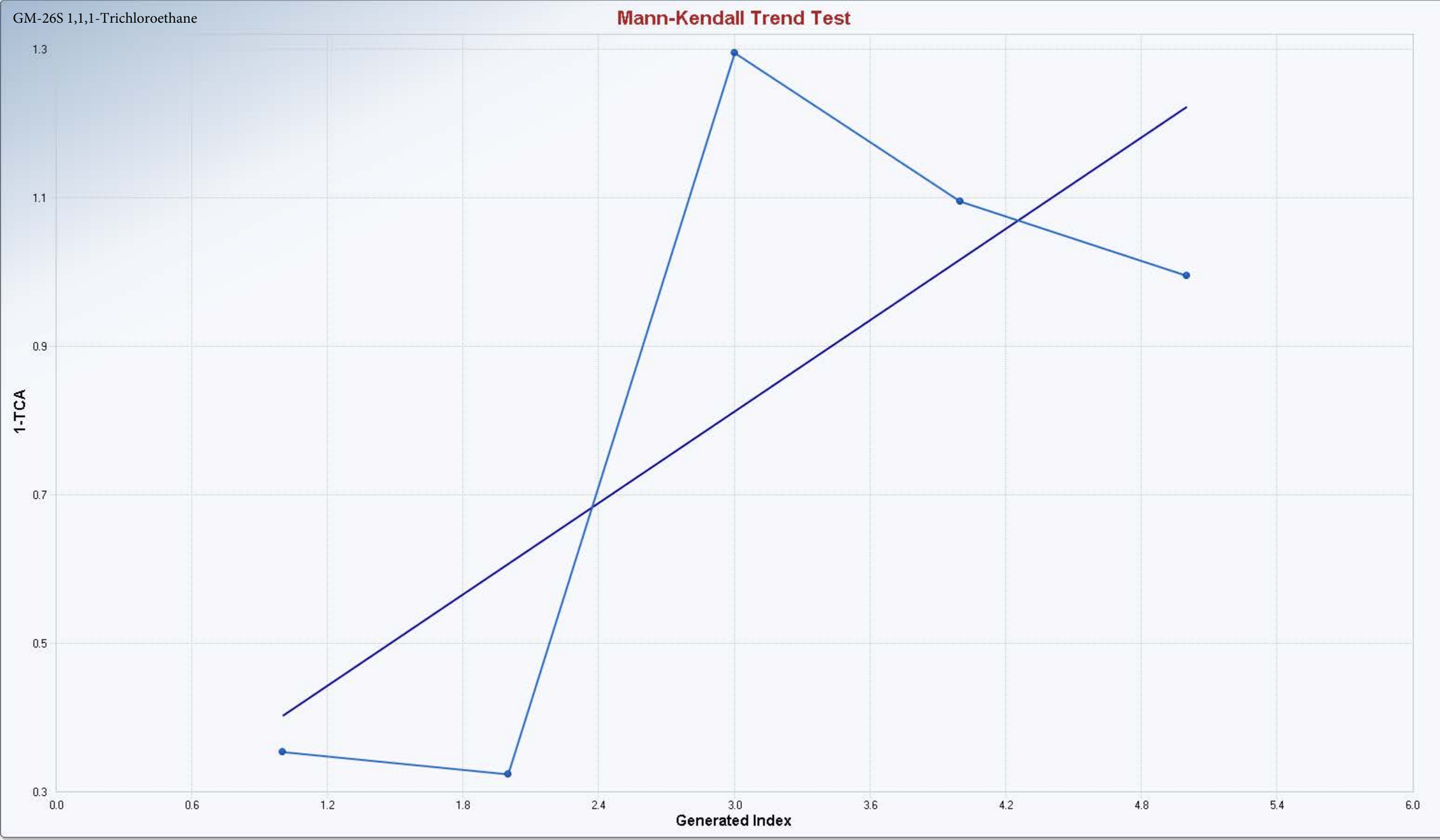
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	0.86
Maximum	8.6
Mean	4.248
Geometric Mean	2.86
Median	4.9
Standard Deviation	3.364
Coefficient of Variation	0.792

Mann-Kendall Test

M-K Test Value (S)	8
Tabulated p-value	0.042
Standard Deviation of S	4.082
Standardized Value of S	1.715
Approximate p-value	0.0432

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-26S 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	0.2449
M-K Test Value (S)	2
Tabulated p-value	0.4080
Approximate p-value	0.4032

OLS Regression Line (Blue)

OLS Regression Slope	0.2050
OLS Regression Intercept	0.2030

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-26S 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:17:28 AM	
From File	GM-26S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	0.33
Maximum	1.3
Mean	0.818
Geometric Mean	0.702
Median	1
Standard Deviation	0.445
Coefficient of Variation	0.544

Mann-Kendall Test

M-K Test Value (S)	2
Tabulated p-value	0.408
Standard Deviation of S	4.082
Standardized Value of S	0.245
Approximate p-value	0.403

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-26S Perchlorate

Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	1.2247
M-K Test Value (S)	6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	27.2900
OLS Regression Intercept	-15.0900

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-26S Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:16:03 AM	
From File	GM-26S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

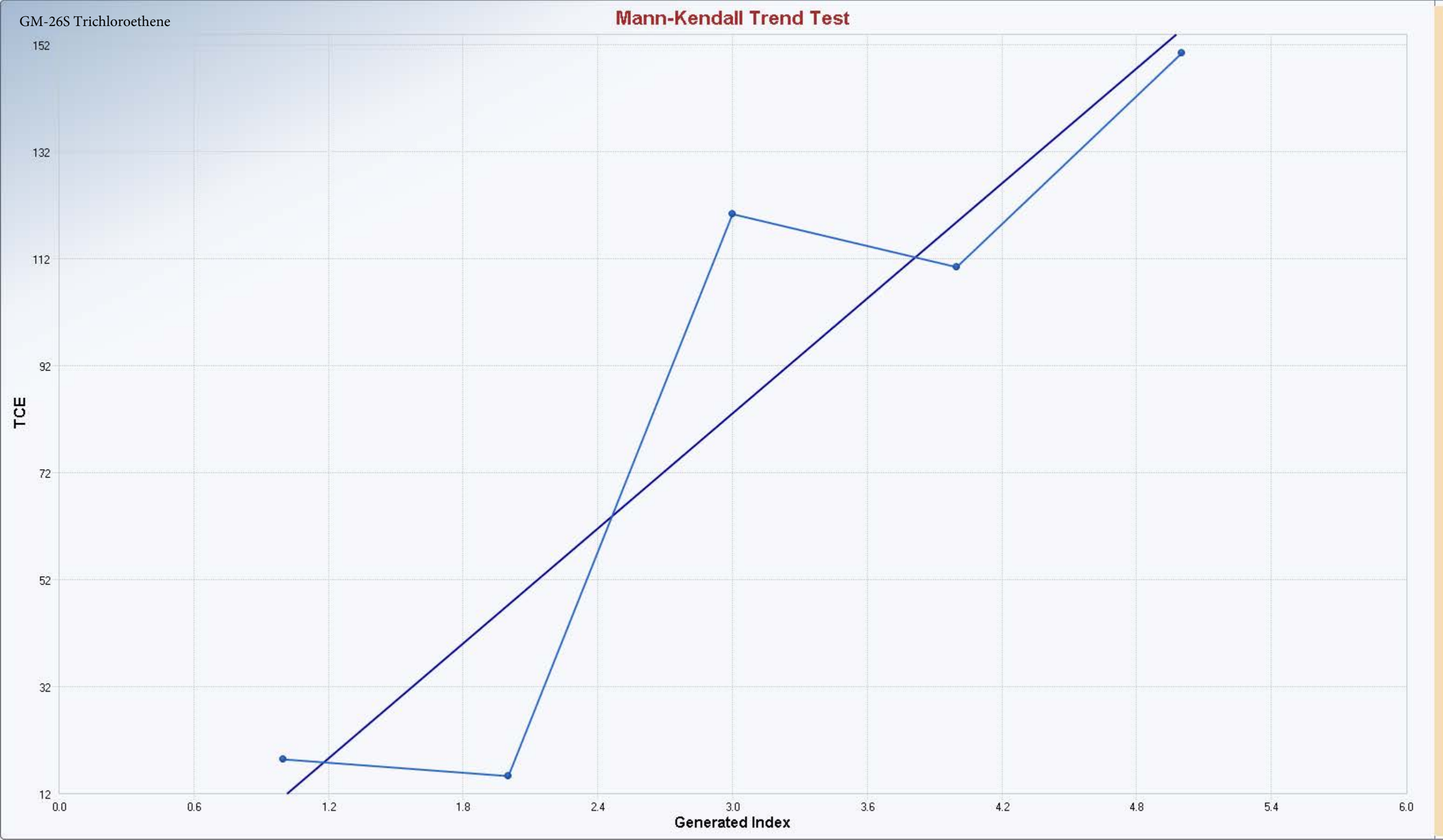
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	6.7
Maximum	110
Mean	66.78
Geometric Mean	42.5
Median	98
Standard Deviation	49.55
Coefficient of Variation	0.742

Mann-Kendall Test

M-K Test Value (S)	6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-26S Trichloroethene



Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	1.2247
M-K Test Value (S)	6
Tabulated p-value	0.1170
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	35.9000
OLS Regression Intercept	-25.1000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-26S Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 10:20:11 AM	
From File	GM-26S.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	15
Maximum	150
Mean	82.6
Geometric Mean	55.67
Median	110
Standard Deviation	62.12
Coefficient of Variation	0.752

Mann-Kendall Test

M-K Test Value (S)	6
Tabulated p-value	0.117
Standard Deviation of S	4.082
Standardized Value of S	1.225
Approximate p-value	0.11

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-30M Perchlorate

Mann-Kendall Trend Analysis

n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	0.2449
M-K Test Value (S)	2
Tabulated p-value	0.4080
Approximate p-value	0.4032

OLS Regression Line (Blue)

OLS Regression Slope	-0.0100
OLS Regression Intercept	7.8700

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-30M Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:01:32 PM	
From File	GM-30M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

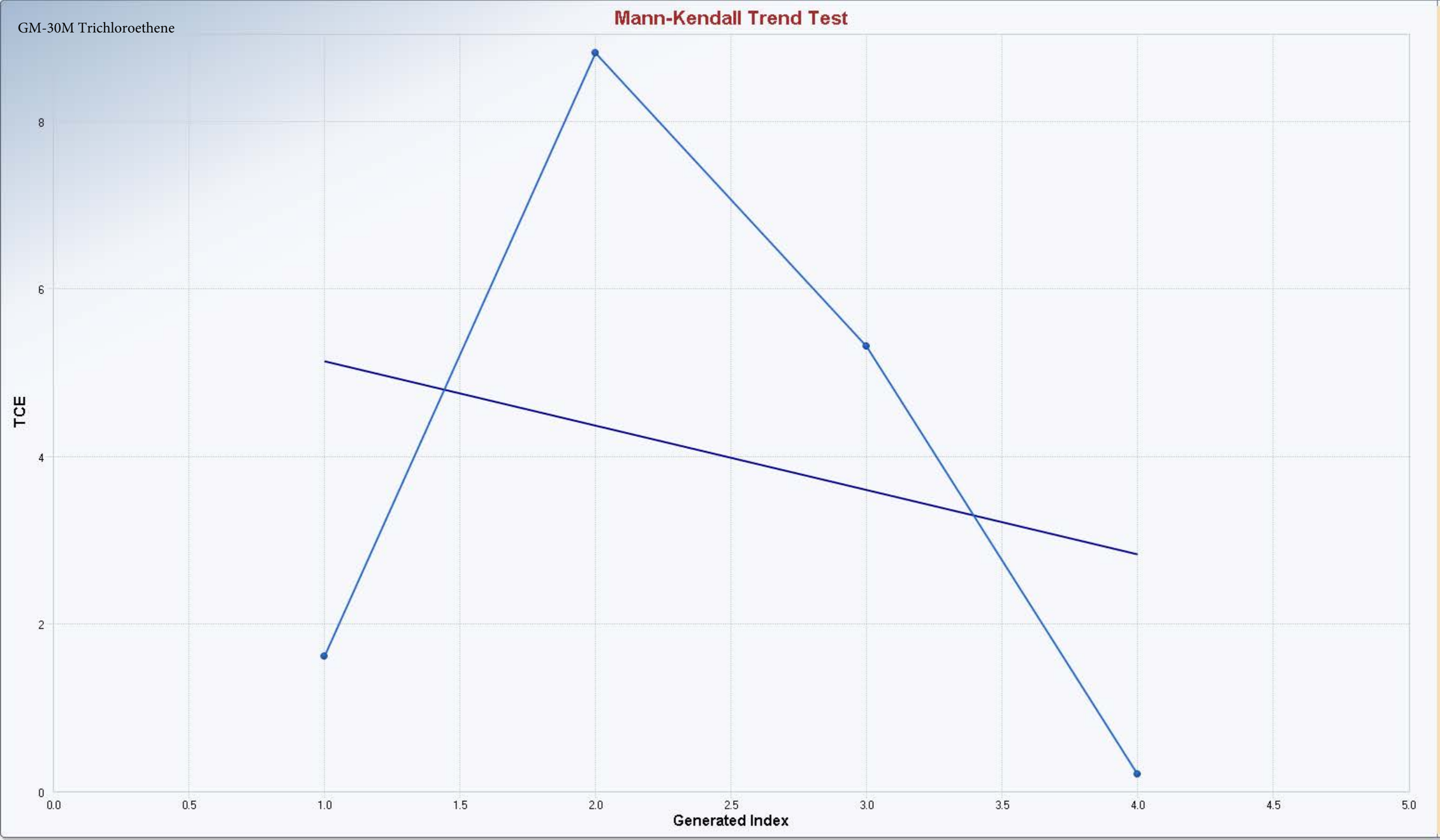
Number or Reported Events Not Used	0
Number of Generated Events	5
Number Values Reported (n)	5
Minimum	1
Maximum	14
Mean	7.84
Geometric Mean	5.622
Median	6.3
Standard Deviation	5.531
Coefficient of Variation	0.705

Mann-Kendall Test

M-K Test Value (S)	2
Tabulated p-value	0.408
Standard Deviation of S	4.082
Standardized Value of S	0.245
Approximate p-value	0.403

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-30M Trichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-0.3397
M-K Test Value (S)	-2
Tabulated p-value	0.3750
Approximate p-value	0.3670

OLS Regression Line (Blue)

OLS Regression Slope	-0.7700
OLS Regression Intercept	6.4000

Insufficient statistical evidence of a significant trend at the specified level of significance.

GM-30M Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:07:19 PM	
From File	GM-30M.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

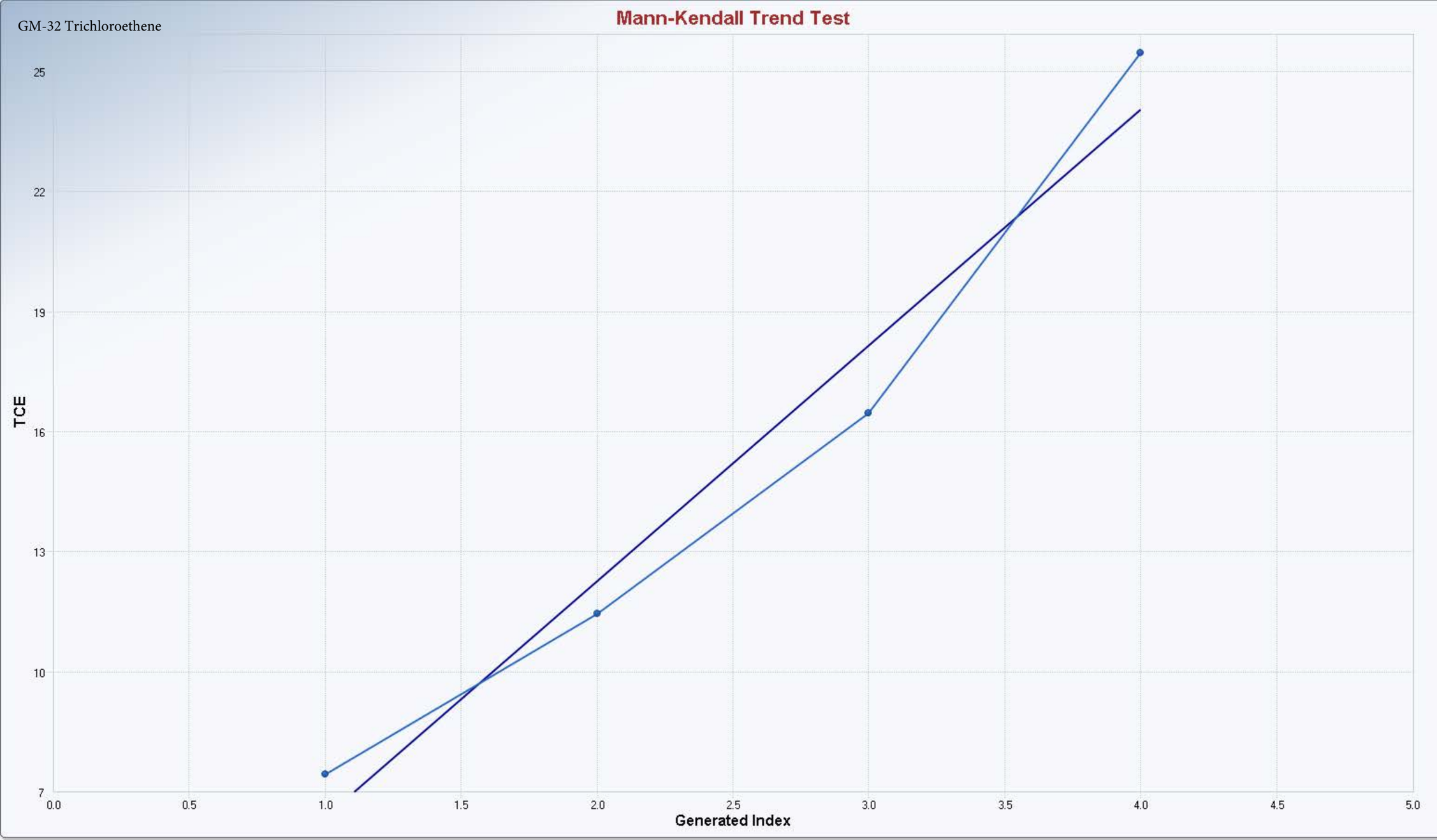
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	5
Number Values Missing	1
Number Values Used	4
Minimum	0.7
Maximum	9.3
Mean	4.475
Geometric Mean	2.984
Median	3.95
Standard Deviation	3.87
Coefficient of Variation	0.865

Mann-Kendall Test

M-K Test Value (S)	-2
Tabulated p-value	0.375
Standard Deviation of S	2.944
Standardized Value of S	-0.34
Approximate p-value	0.367

Insufficient evidence to identify a significant trend at the specified level of significance.

GM-32 Trichloroethene



Mann-Kendall Trend Analysis

n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	1.6984
M-K Test Value (S)	6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)

OLS Regression Slope	5.9000
OLS Regression Intercept	0.0000

Statistically significant evidence of an increasing trend at the specified level of significance.

GM-32 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:08:32 PM	
From File	GM-32.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

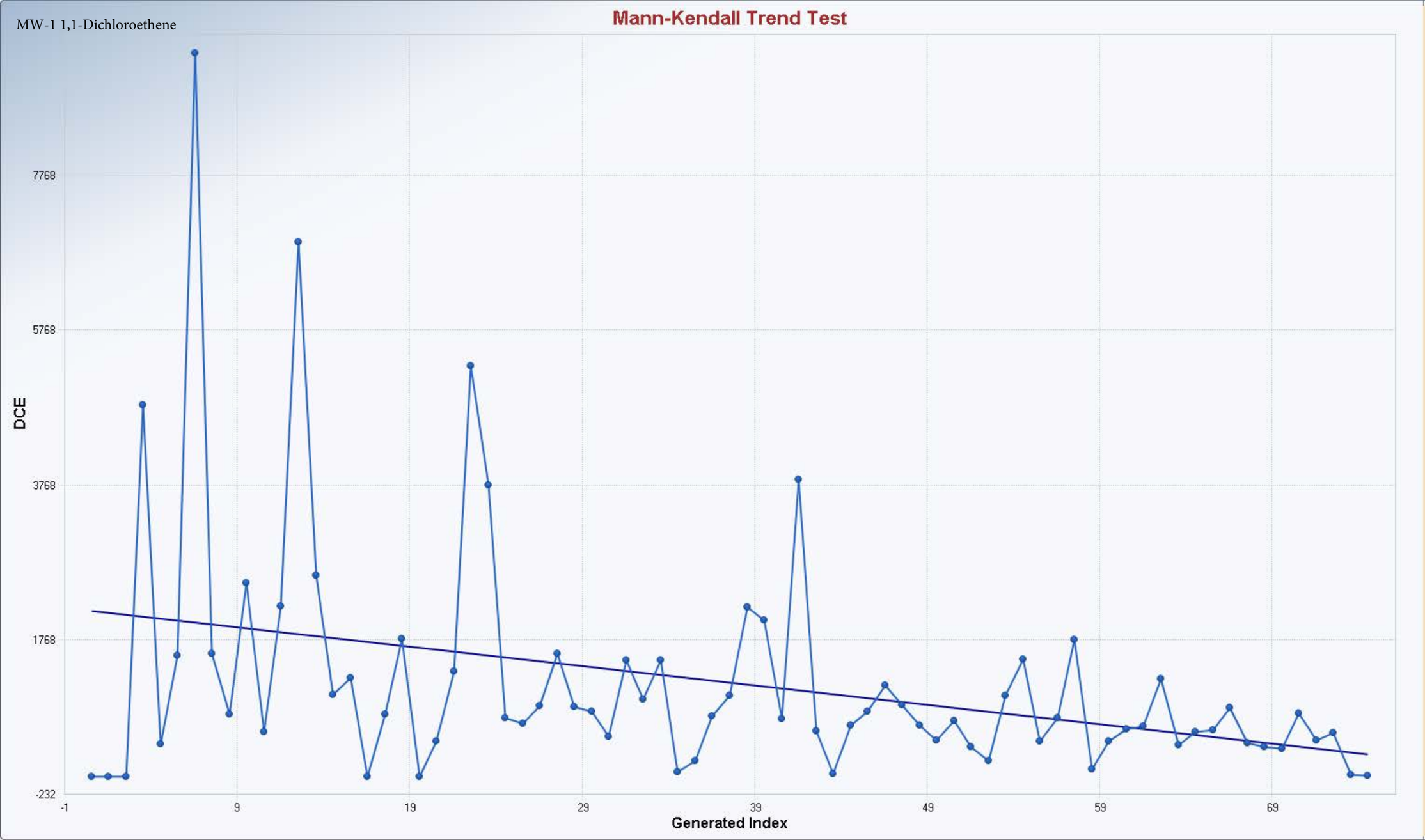
Number or Reported Events Not Used	0
Number of Generated Events	4
Number Values Reported (n)	4
Minimum	7
Maximum	25
Mean	14.75
Geometric Mean	13.25
Median	13.5
Standard Deviation	7.762
Coefficient of Variation	0.526

Mann-Kendall Test

M-K Test Value (S)	6
Tabulated p-value	0.042
Standard Deviation of S	2.944
Standardized Value of S	1.698
Approximate p-value	0.0447

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-1 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	218.5589
Standardized Value of S	-2.9969
M-K Test Value (S)	-656
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0014

OLS Regression Line (Blue)

OLS Regression Slope	-25.0706
OLS Regression Intercept	2,163.2350

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:24:32 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCE

General Statistics

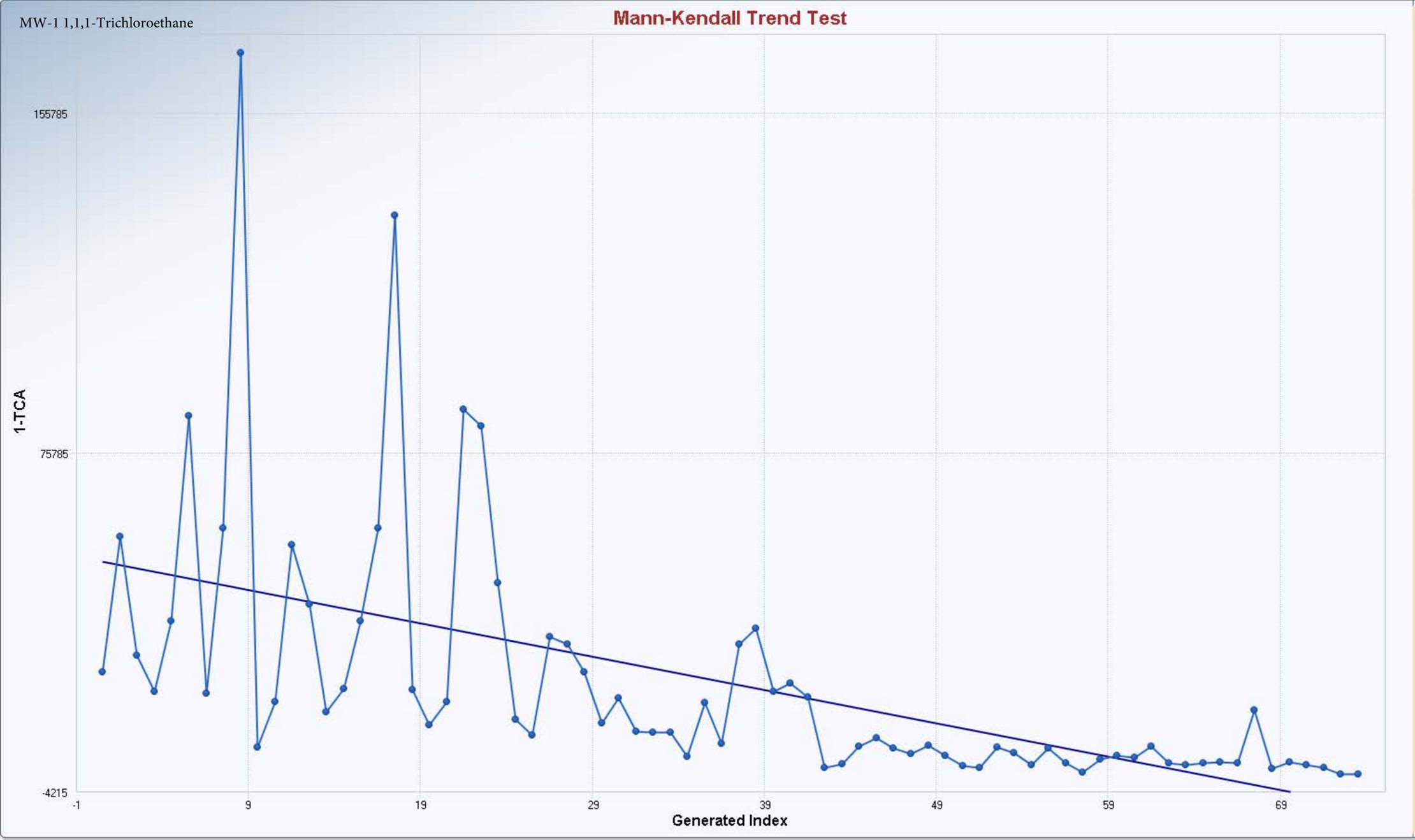
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	1
Maximum	9340
Mean	1211
Geometric Mean	487.6
Median	754
Standard Deviation	1553
Coefficient of Variation	1.283

Mann-Kendall Test

M-K Test Value (S)	-656
Critical Value (0.05)	-1.645
Standard Deviation of S	218.6
Standardized Value of S	-2.997
Approximate p-value	0.00136

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2685
Standardized Value of S	-7.8033
M-K Test Value (S)	-1,673
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-788.7959
OLS Regression Intercept	50,866.9689

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:09:51 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

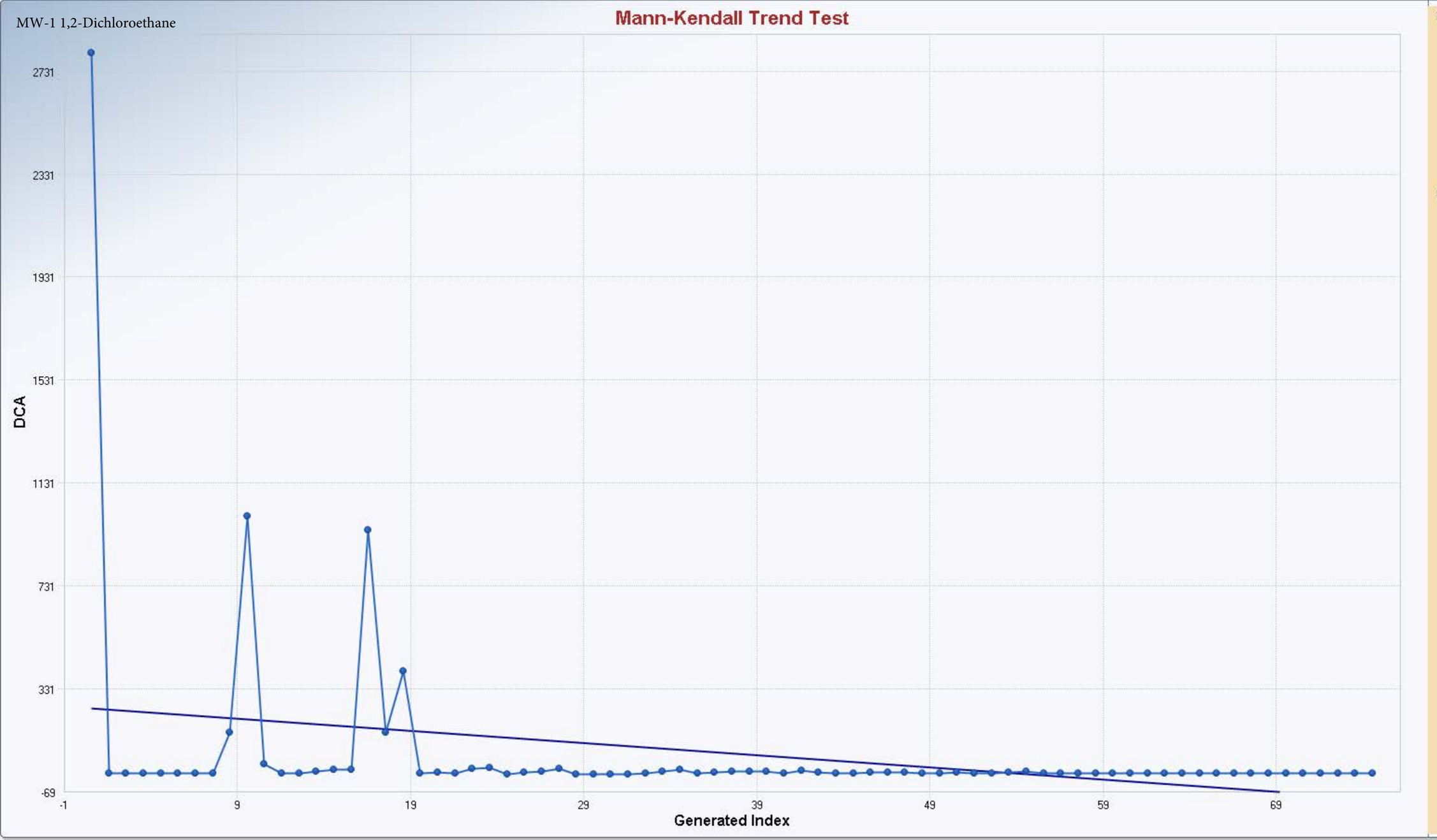
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	75
Number Values Missing	1
Number Values Used	74
Minimum	34
Maximum	170000
Mean	21287
Geometric Mean	8981
Median	9900
Standard Deviation	29794
Coefficient of Variation	1.4

Mann-Kendall Test

M-K Test Value (S)	-1673
Critical Value (0.05)	-1.645
Standard Deviation of S	214.3
Standardized Value of S	-7.803
Approximate p-value	3.016E-15

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,2-Dichloroethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	213.2198
Standardized Value of S	-2.6311
M-K Test Value (S)	-562
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0043

OLS Regression Line (Blue)

OLS Regression Slope	-4.8031
OLS Regression Intercept	260.1668

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:06:15 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCA

General Statistics

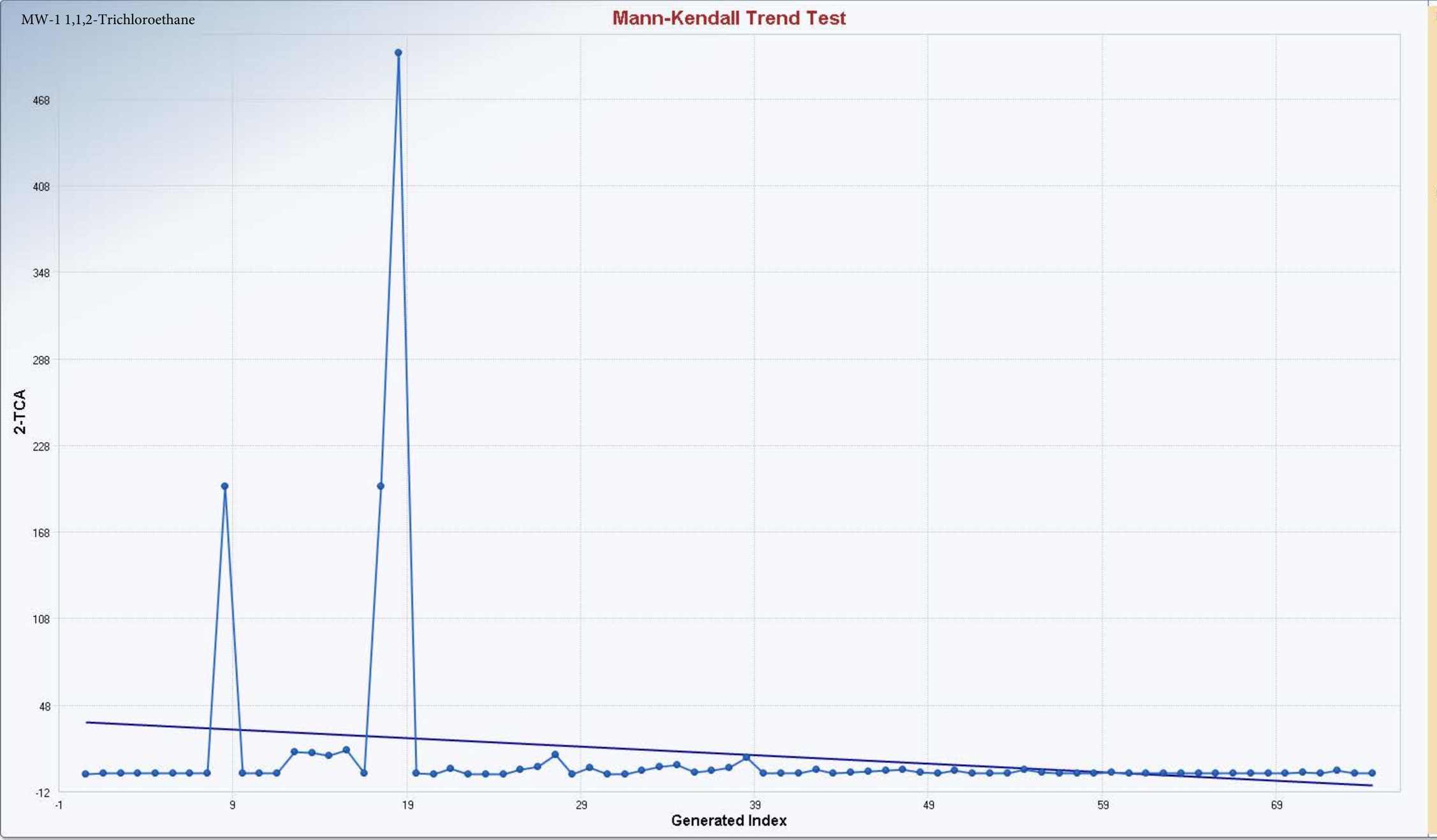
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	2800
Mean	77.65
Geometric Mean	4.003
Median	3
Standard Deviation	358.3
Coefficient of Variation	4.614

Mann-Kendall Test

M-K Test Value (S)	-562
Critical Value (0.05)	-1.645
Standard Deviation of S	213.2
Standardized Value of S	-2.631
Approximate p-value	0.00426

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 1,1,2-Trichloroethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	206.7881
Standardized Value of S	-1.1654
M-K Test Value (S)	-242
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1219

OLS Regression Line (Blue)

OLS Regression Slope	-0.5856
OLS Regression Intercept	36.9574

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-1 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 6:23:11 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

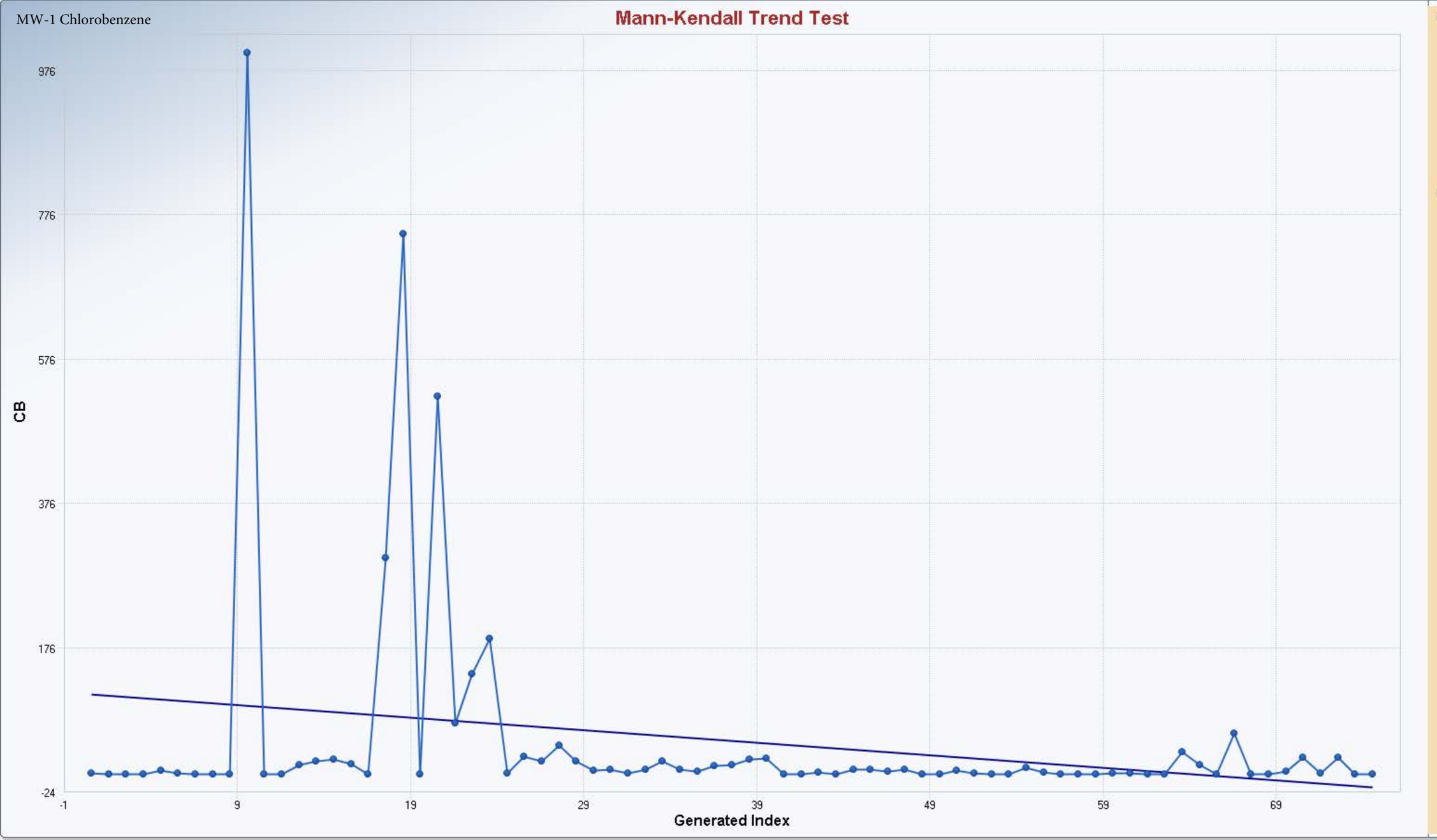
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.7
Maximum	500
Mean	14.7
Geometric Mean	2.076
Median	1
Standard Deviation	65.28
Coefficient of Variation	4.44

Mann-Kendall Test

M-K Test Value (S)	-242
Critical Value (0.05)	-1.645
Standard Deviation of S	206.8
Standardized Value of S	-1.165
Approximate p-value	0.122

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-1 Chlorobenzene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	213.2174
Standardized Value of S	-1.4914
M-K Test Value (S)	-319
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0679

OLS Regression Line (Blue)

OLS Regression Slope	-1.7318
OLS Regression Intercept	112.5617

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-1 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:07:49 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	1
Maximum	1000
Mean	46.75
Geometric Mean	5.193
Median	4
Standard Deviation	157.5
Coefficient of Variation	3.368

Mann-Kendall Test

M-K Test Value (S)	-319
Critical Value (0.05)	-1.645
Standard Deviation of S	213.2
Standardized Value of S	-1.491
Approximate p-value	0.0679

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-1 Chloroform

Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	213.6500
Standardized Value of S	-4.6618
M-K Test Value (S)	-997
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.9075
OLS Regression Intercept	255.7965

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:19:26 AM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CF

General Statistics

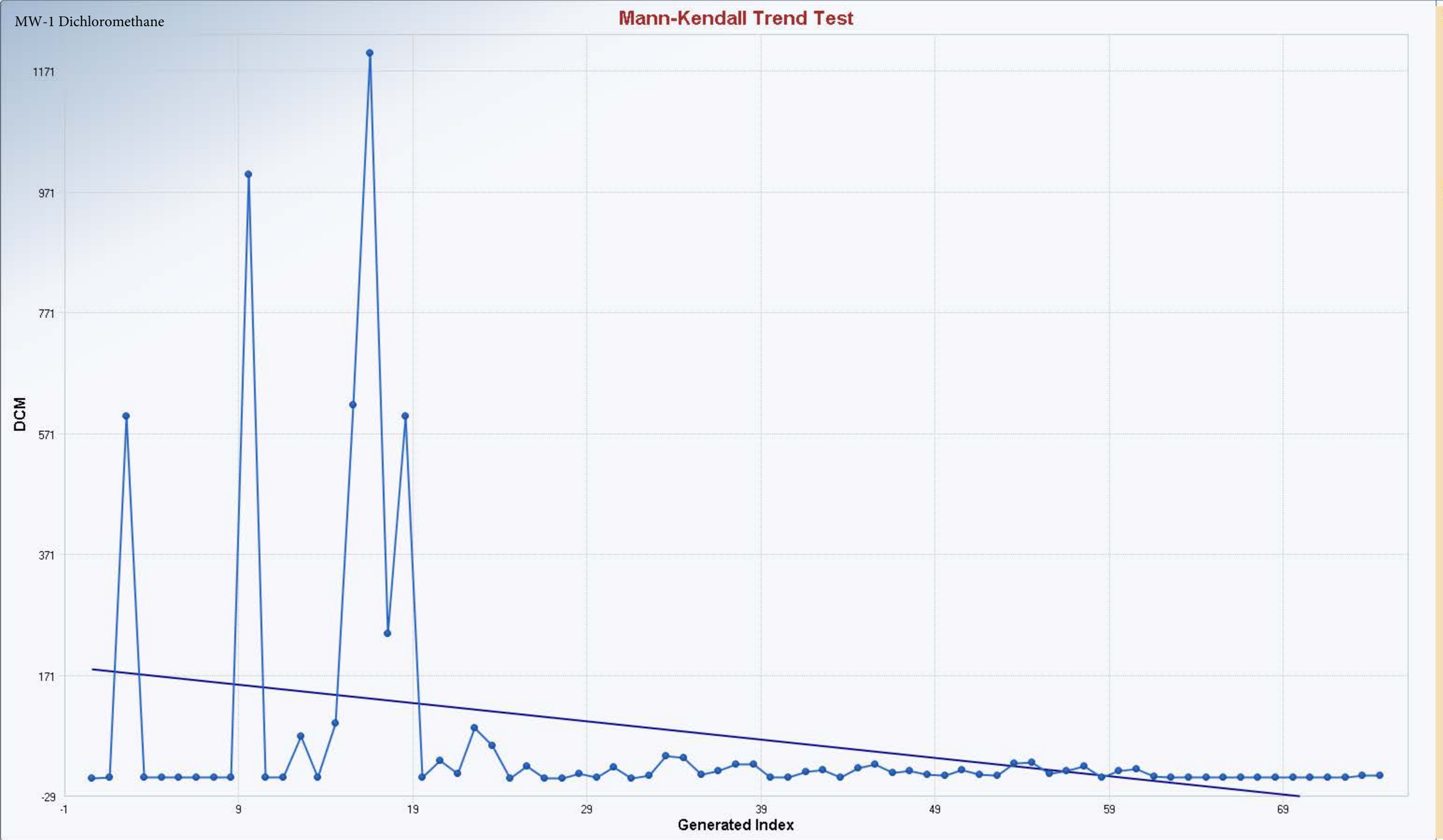
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	75
Number Values Missing	1
Number Values Used	74
Minimum	0.55
Maximum	1300
Mean	109.3
Geometric Mean	28.47
Median	50.7
Standard Deviation	195.2
Coefficient of Variation	1.786

Mann-Kendall Test

M-K Test Value (S)	-997
Critical Value (0.05)	-1.645
Standard Deviation of S	213.7
Standardized Value of S	-4.662
Approximate p-value	1.5671E-6

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Dichloromethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.8046
Standardized Value of S	-1.4339
M-K Test Value (S)	-309
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0758

OLS Regression Line (Blue)

OLS Regression Slope	-3.0538
OLS Regression Intercept	183.7039

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-1 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:09:49 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

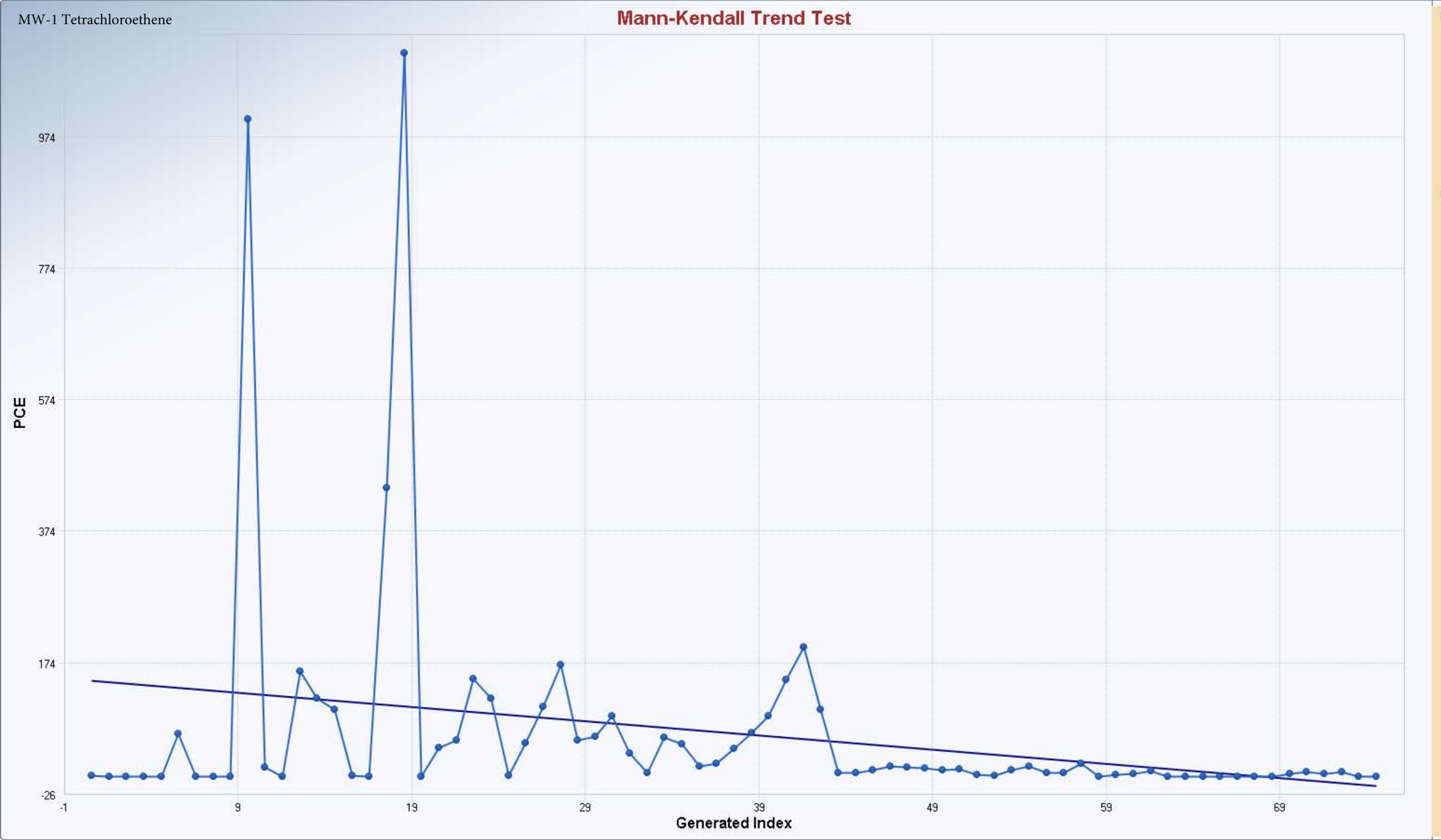
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.7
Maximum	1200
Mean	67.66
Geometric Mean	6.301
Median	5.4
Standard Deviation	210.8
Coefficient of Variation	3.116

Mann-Kendall Test

M-K Test Value (S)	-309
Critical Value (0.05)	-1.645
Standard Deviation of S	214.8
Standardized Value of S	-1.434
Approximate p-value	0.0758

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-1 Tetrachloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	216.4070
Standardized Value of S	-2.7864
M-K Test Value (S)	-604
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0027

OLS Regression Line (Blue)

OLS Regression Slope	-2.1560
OLS Regression Intercept	148.2036

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:14:51 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

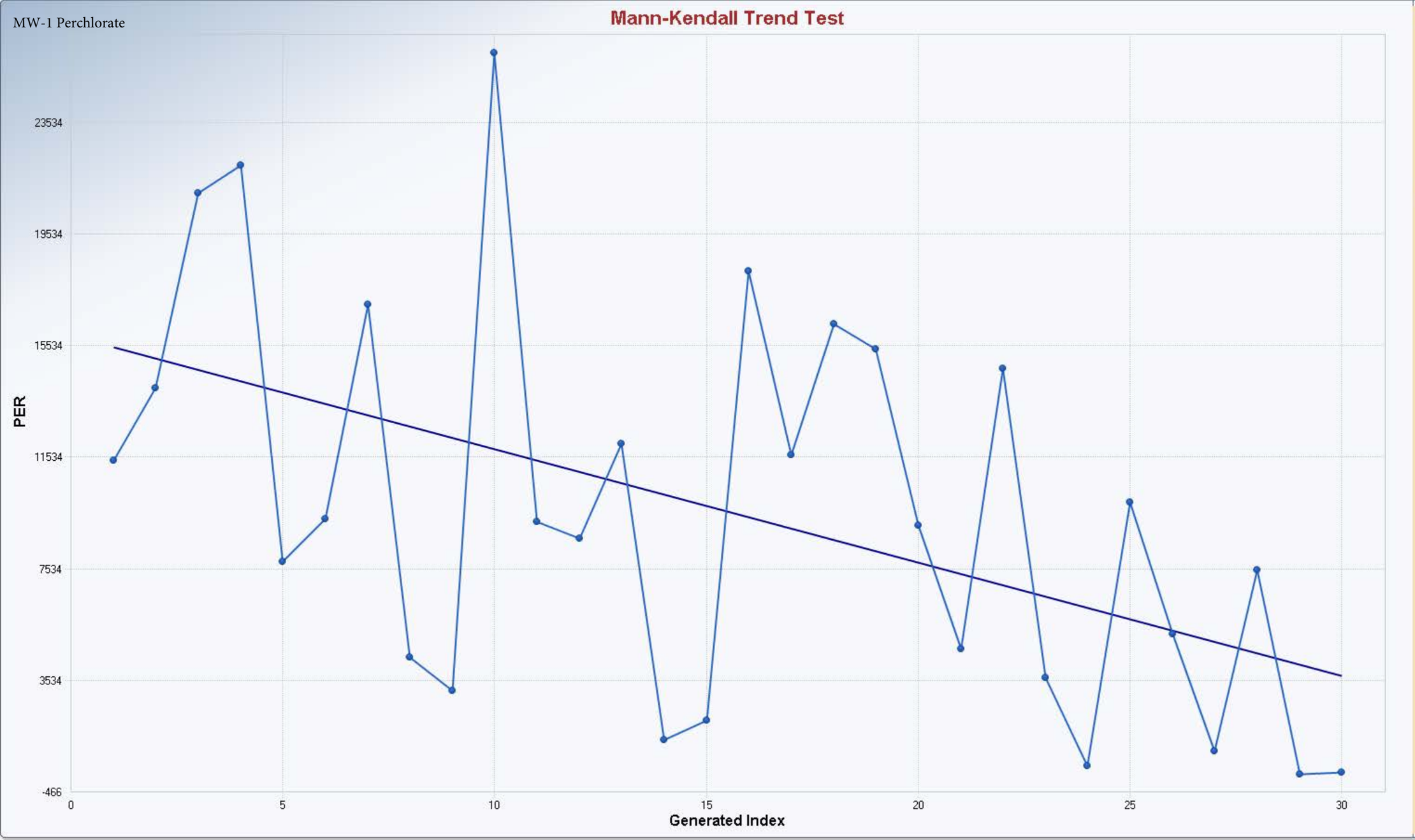
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	1
Maximum	1100
Mean	66.27
Geometric Mean	10.82
Median	10.3
Standard Deviation	177.3
Coefficient of Variation	2.675

Mann-Kendall Test

M-K Test Value (S)	-604
Critical Value (0.05)	-1.645
Standard Deviation of S	216.4
Standardized Value of S	-2.786
Approximate p-value	0.00266

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0506
Standardized Value of S	-2.8902
M-K Test Value (S)	-163
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0019

OLS Regression Line (Blue)

OLS Regression Slope	-405.5562
OLS Regression Intercept	15,864.2874

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:18:46 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PER

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	75
Number Values Missing	45
Number Values Used	30
Minimum	180
Maximum	26000
Mean	9578
Geometric Mean	5805
Median	9135
Standard Deviation	7031
Coefficient of Variation	0.734

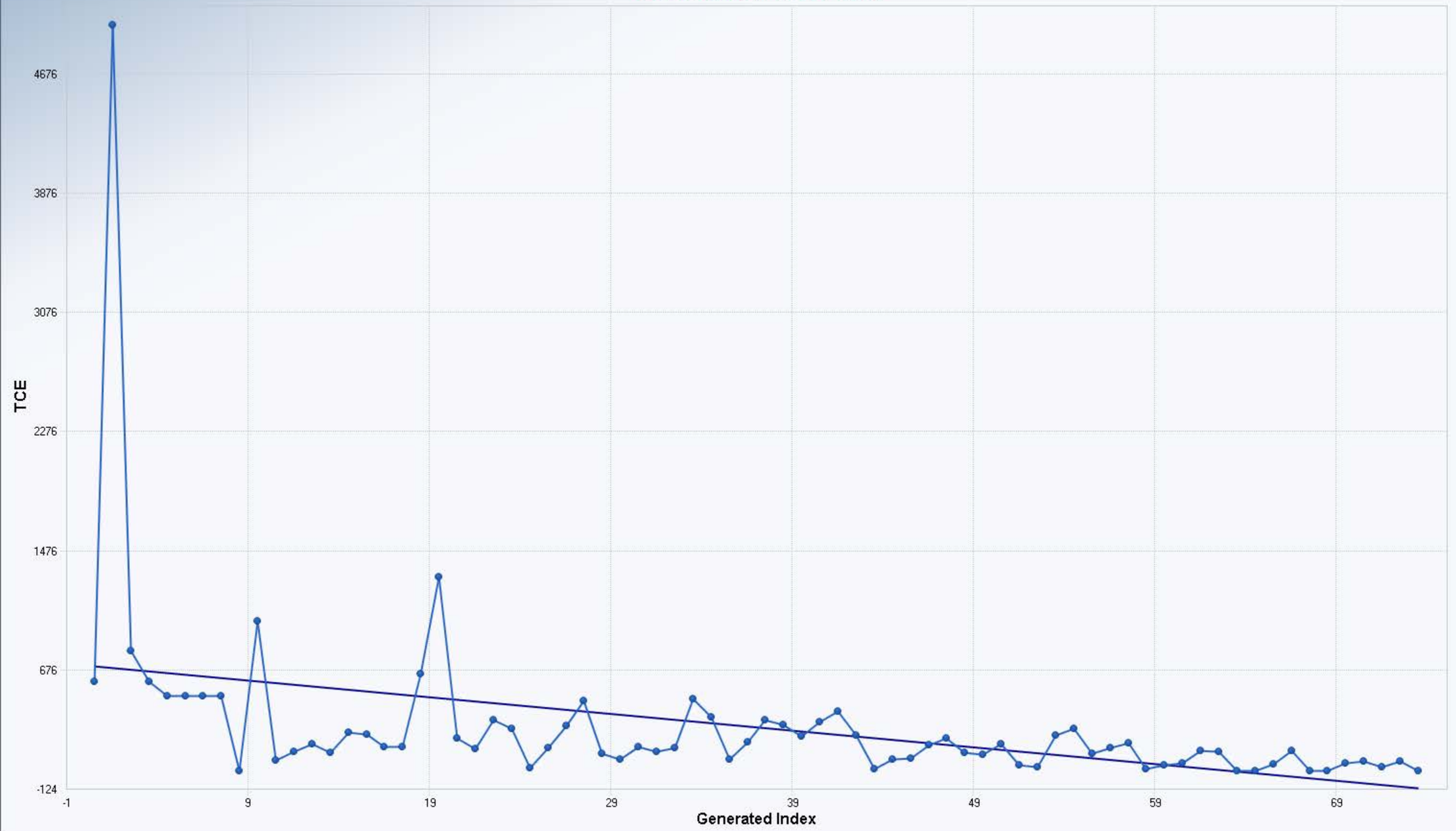
Mann-Kendall Test

M-K Test Value (S)	-163
Critical Value (0.05)	-1.645
Standard Deviation of S	56.05
Standardized Value of S	-2.89
Approximate p-value	0.00192

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Trichloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2117
Standardized Value of S	-5.7840
M-K Test Value (S)	-1,240
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-11.1570
OLS Regression Intercept	708.6121

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-1 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:16:03 PM	
From File	MW-01.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

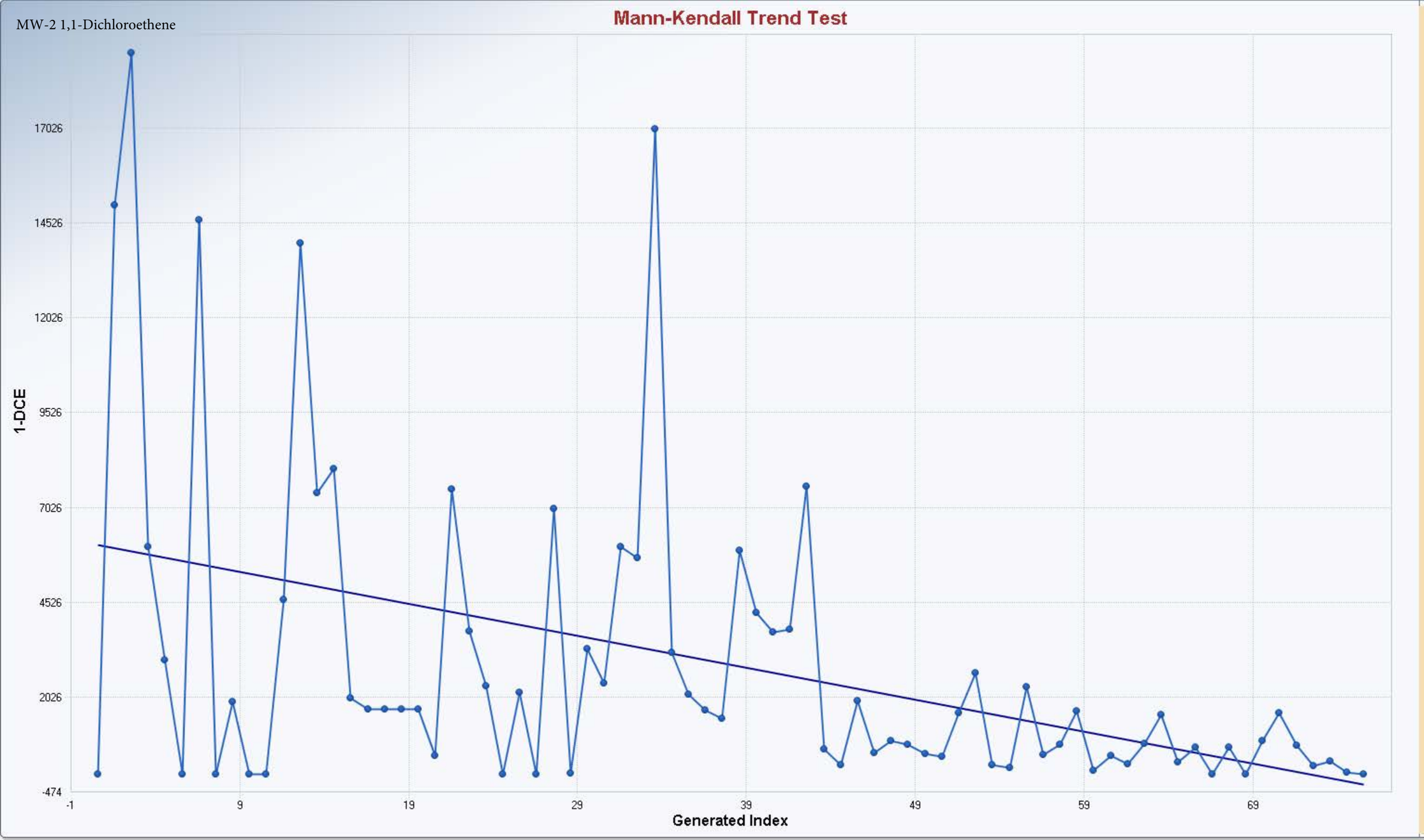
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	75
Number Values Missing	1
Number Values Used	74
Minimum	0.66
Maximum	5000
Mean	290.2
Geometric Mean	109.4
Median	155.5
Standard Deviation	603.2
Coefficient of Variation	2.079

Mann-Kendall Test

M-K Test Value (S)	-1240
Critical Value (0.05)	-1.645
Standard Deviation of S	214.2
Standardized Value of S	-5.784
Approximate p-value	3.6473E-9

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.8041
Standardized Value of S	-3.9586
M-K Test Value (S)	-883
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-84.1113
OLS Regression Intercept	6,110.9373

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:26:39 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

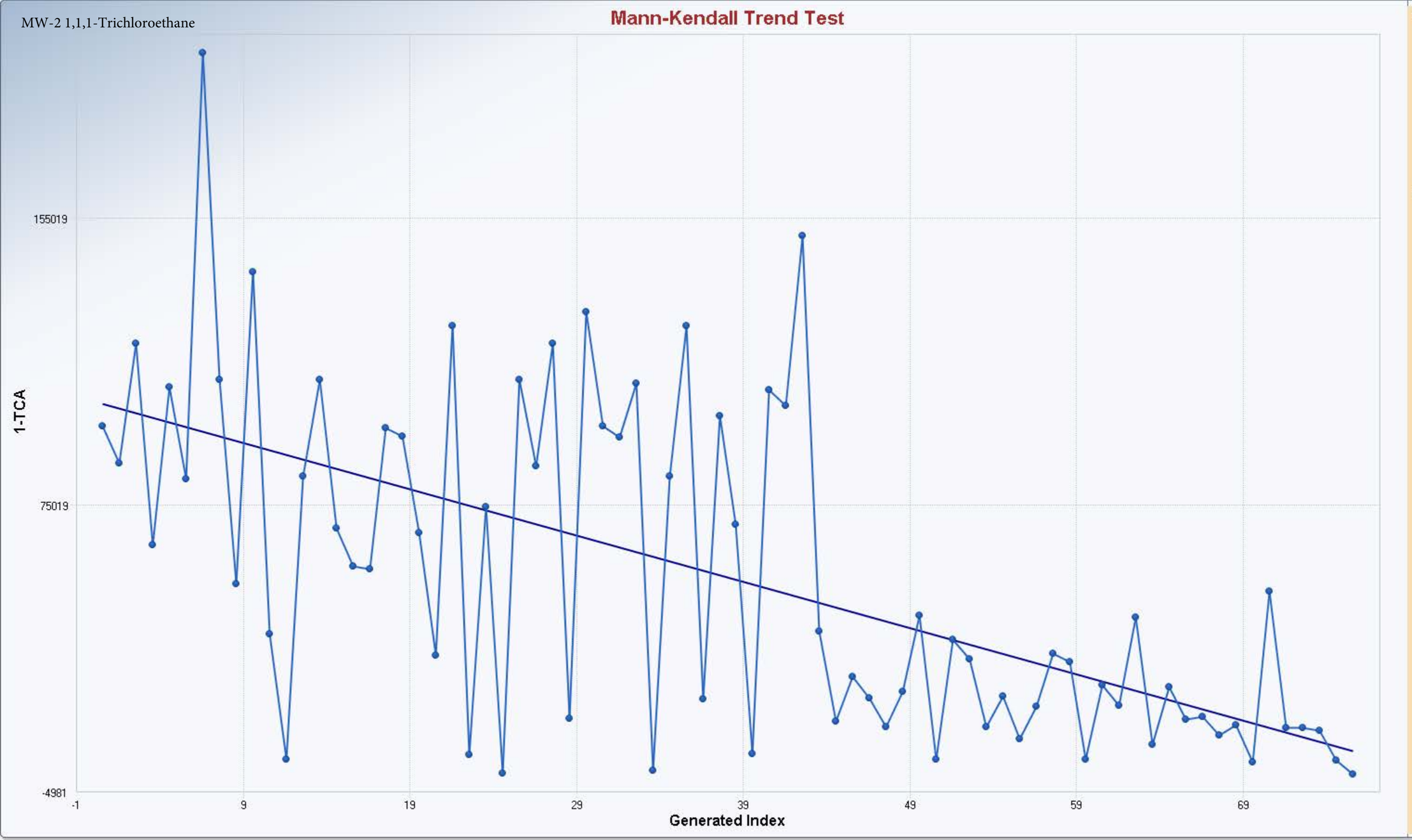
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	1
Maximum	19000
Mean	2873
Geometric Mean	589.9
Median	1605
Standard Deviation	4112
Coefficient of Variation	1.431

Mann-Kendall Test

M-K Test Value (S)	-883
Critical Value (0.05)	-1.645
Standard Deviation of S	222.8
Standardized Value of S	-3.959
Approximate p-value	3.7690E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.9507
Standardized Value of S	-5.4810
M-K Test Value (S)	-1,223
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1,288.9682
OLS Regression Intercept	104,411.9716

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:24:23 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	43
Maximum	201000
Mean	54787
Geometric Mean	29278
Median	39450
Standard Deviation	46109
Coefficient of Variation	0.842

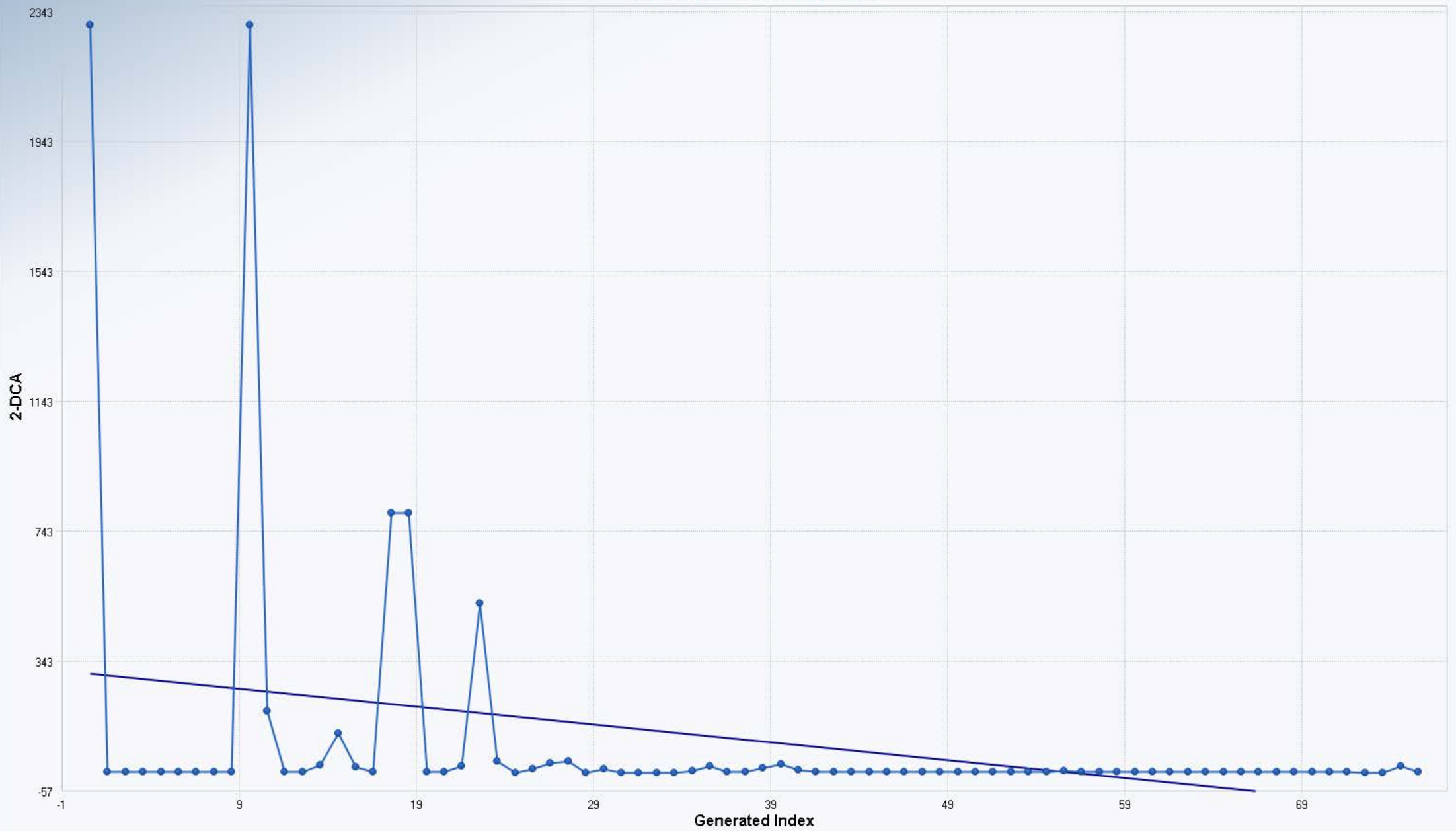
Mann-Kendall Test

M-K Test Value (S)	-1223
Critical Value (0.05)	-1.645
Standard Deviation of S	223
Standardized Value of S	-5.481
Approximate p-value	2.1142E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,2-Dichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	204.2564
Standardized Value of S	-3.0109
M-K Test Value (S)	-616
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0013

OLS Regression Line (Blue)

OLS Regression Slope	-5.5136
OLS Regression Intercept	309.2840

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:27:40 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	2300
Mean	97.01
Geometric Mean	3.081
Median	1
Standard Deviation	391.1
Coefficient of Variation	4.032

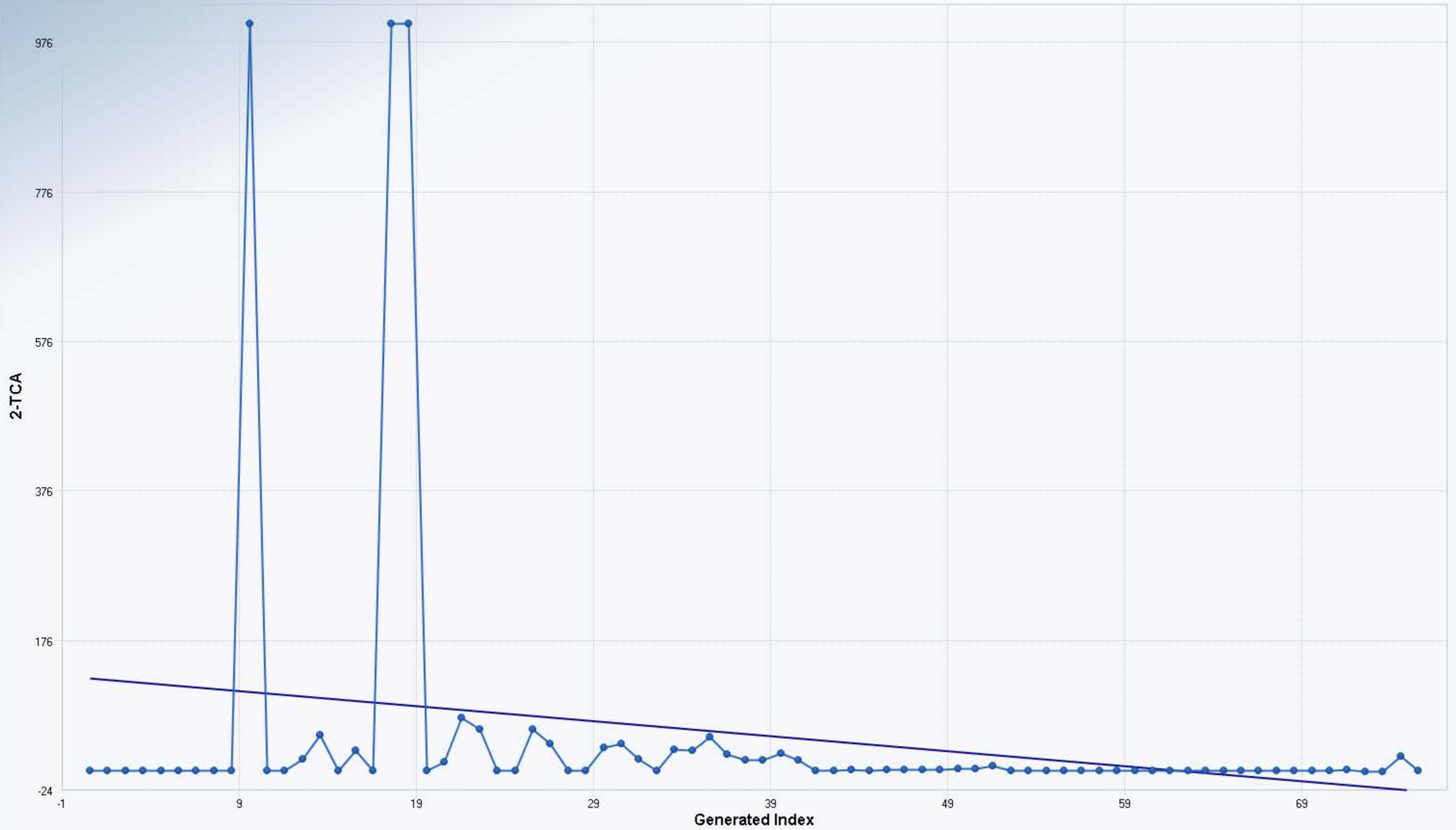
Mann-Kendall Test

M-K Test Value (S)	-616
Critical Value (0.05)	-1.645
Standard Deviation of S	204.3
Standardized Value of S	-3.011
Approximate p-value	0.0013

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1,2-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	211.4655
Standardized Value of S	-2.3834
M-K Test Value (S)	-505
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0086

OLS Regression Line (Blue)

OLS Regression Slope	-2.0224
OLS Regression Intercept	126.6153

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:25:34 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

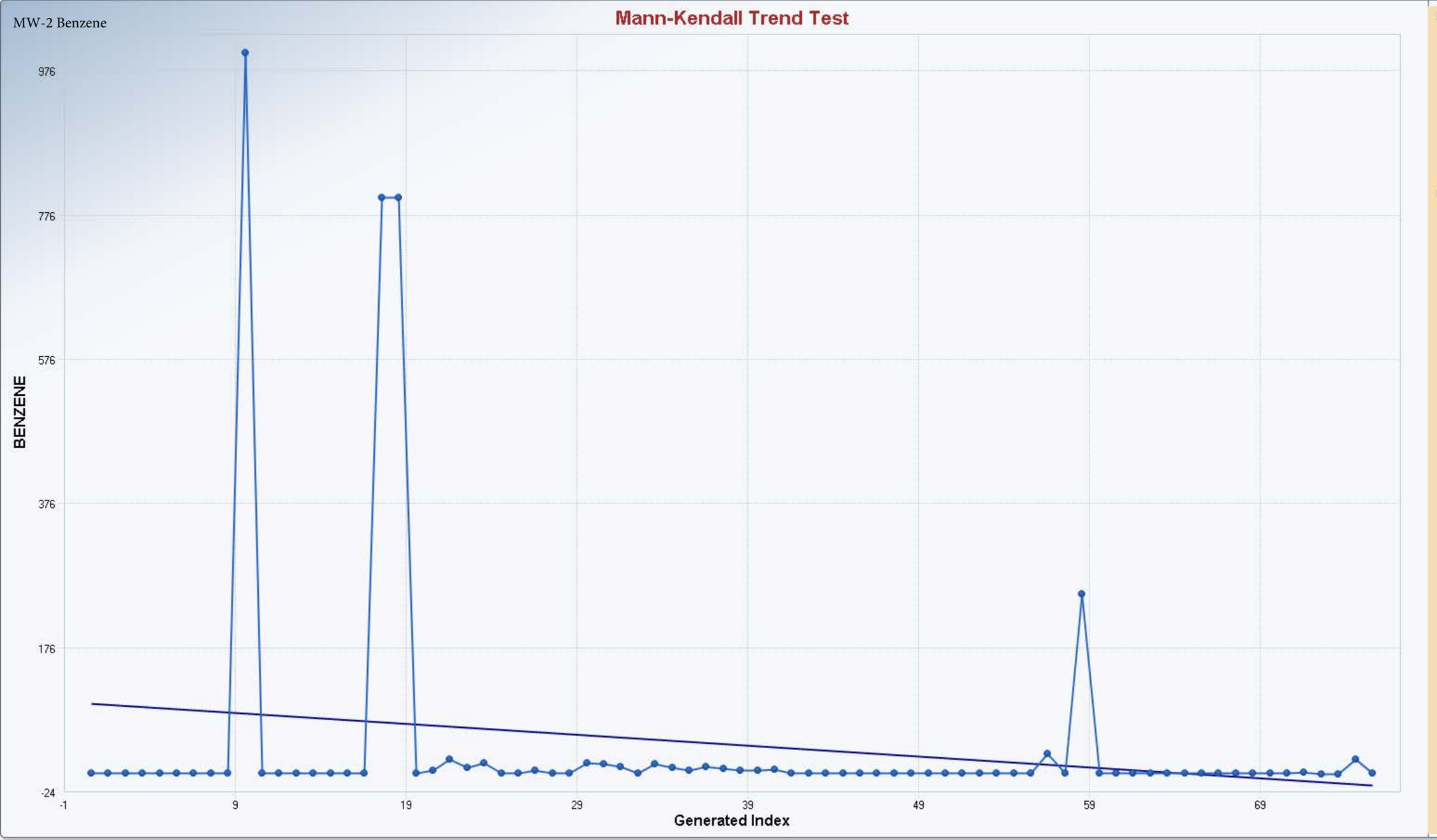
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	1000
Mean	48.75
Geometric Mean	3.46
Median	1
Standard Deviation	194.8
Coefficient of Variation	3.995

Mann-Kendall Test

M-K Test Value (S)	-505
Critical Value (0.05)	-1.645
Standard Deviation of S	211.5
Standardized Value of S	-2.383
Approximate p-value	0.00858

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Benzene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	199.7749
Standardized Value of S	-1.0562
M-K Test Value (S)	-212
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1454

OLS Regression Line (Blue)

OLS Regression Slope	-1.5109
OLS Regression Intercept	99.1109

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-2 Benzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:28:49 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

BENZENE

General Statistics

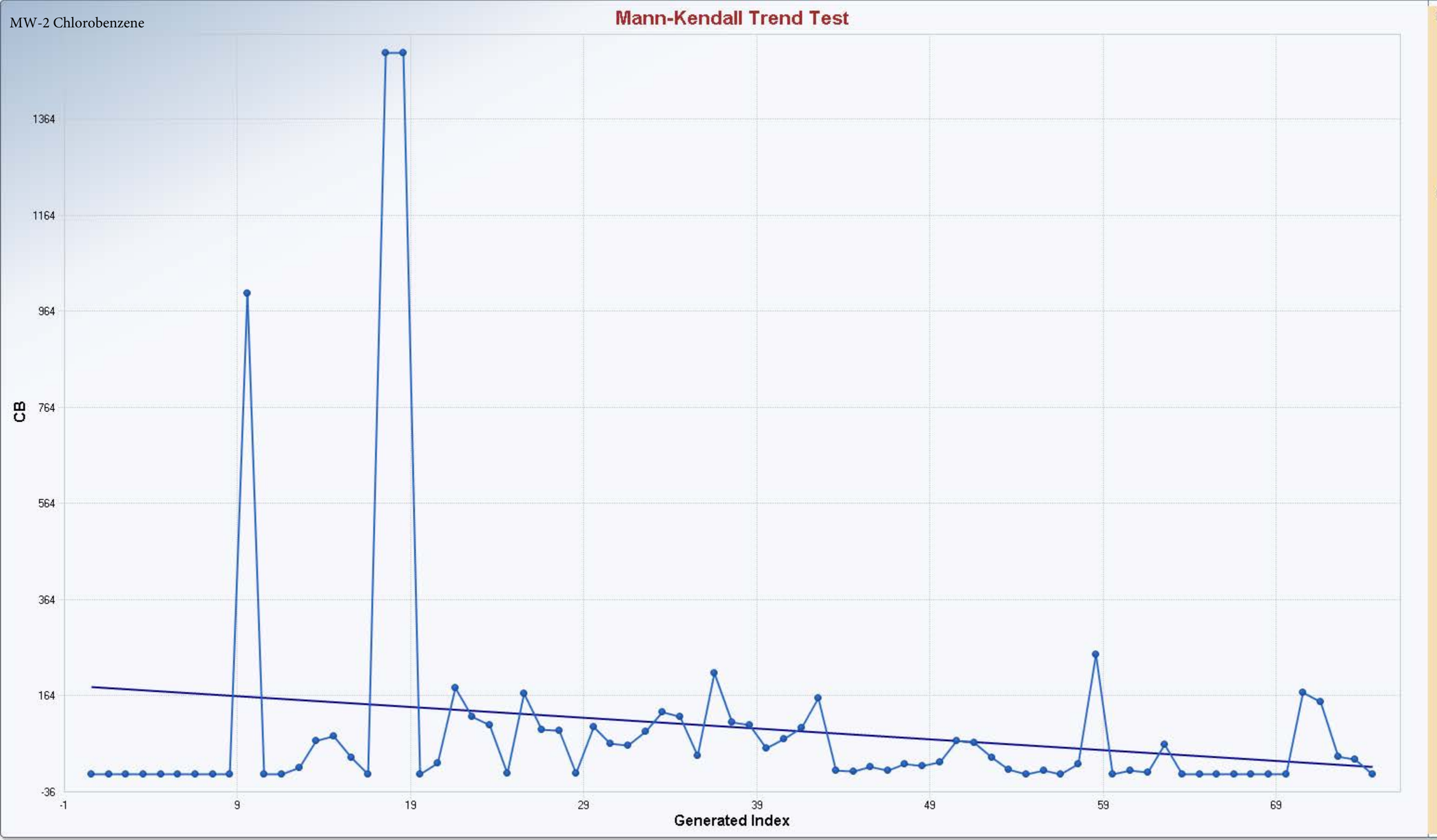
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	1000
Mean	40.94
Geometric Mean	2.377
Median	1
Standard Deviation	172
Coefficient of Variation	4.201

Mann-Kendall Test

M-K Test Value (S)	-212
Critical Value (0.05)	-1.645
Standard Deviation of S	199.8
Standardized Value of S	-1.056
Approximate p-value	0.145

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-2 Chlorobenzene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.8519
Standardized Value of S	-0.4329
M-K Test Value (S)	-94
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3326

OLS Regression Line (Blue)

OLS Regression Slope	-2.2466
OLS Regression Intercept	184.4386

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-2 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:30:55 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

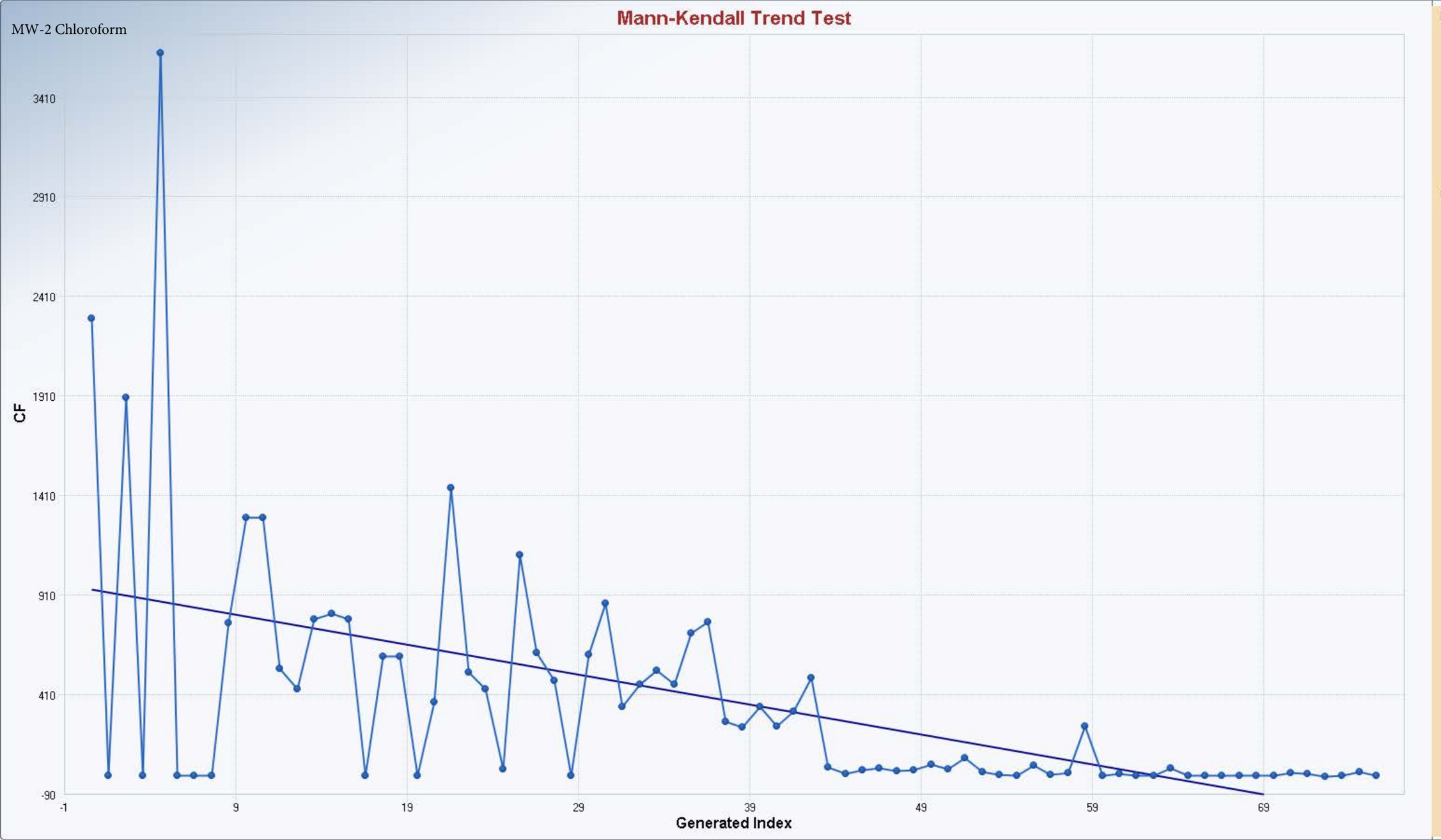
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	76
Number Values Missing	1
Number Values Used	75
Minimum	1
Maximum	1500
Mean	99.07
Geometric Mean	14.33
Median	21.9
Standard Deviation	264.6
Coefficient of Variation	2.671

Mann-Kendall Test

M-K Test Value (S)	-94
Critical Value (0.05)	-1.645
Standard Deviation of S	214.9
Standardized Value of S	-0.433
Approximate p-value	0.333

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-2 Chloroform



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.0435
Standardized Value of S	-5.9042
M-K Test Value (S)	-1,312
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-15.1155
OLS Regression Intercept	955.5639

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:32:08 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

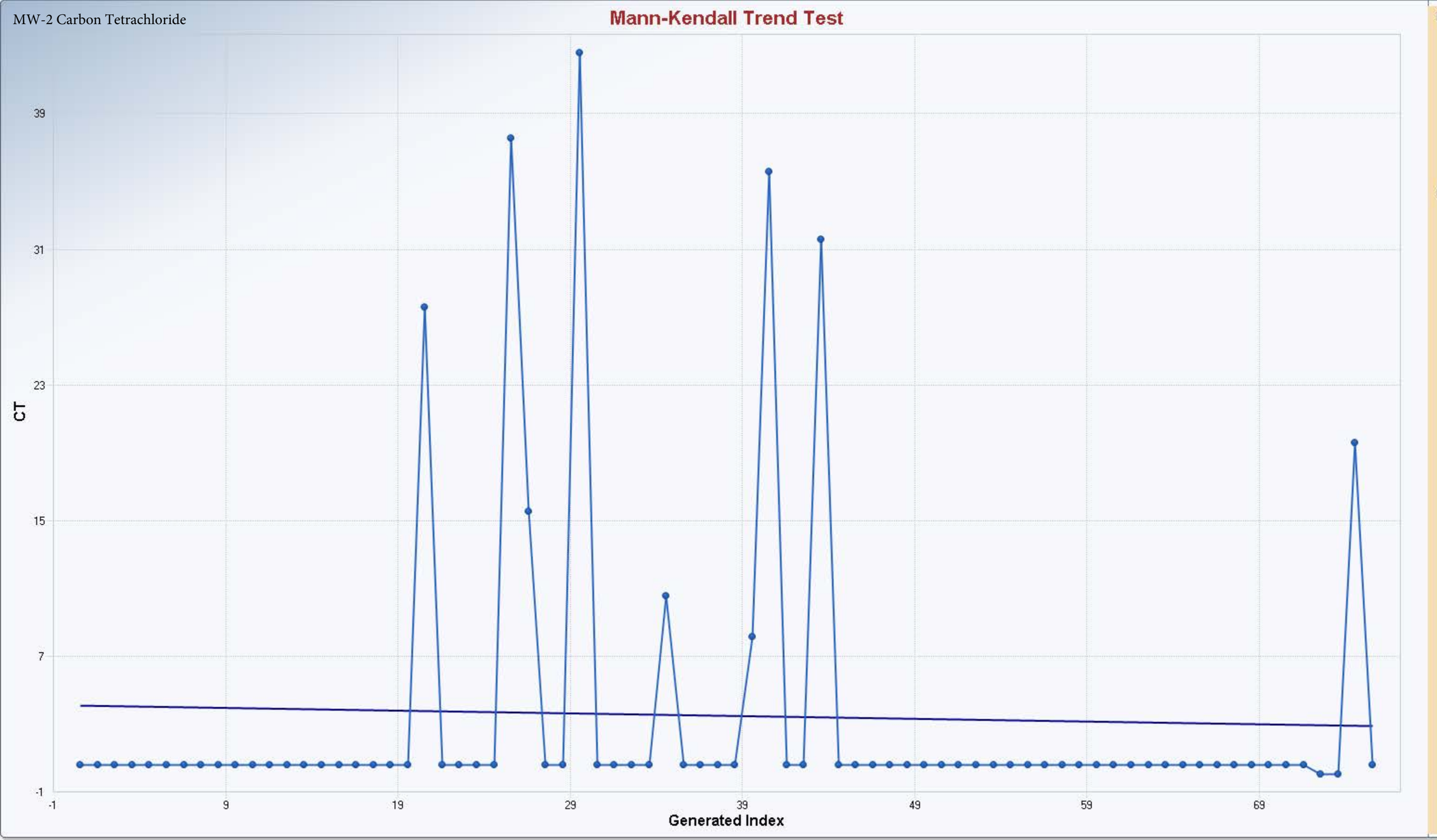
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	3630
Mean	373.6
Geometric Mean	49.17
Median	51.25
Standard Deviation	599.4
Coefficient of Variation	1.604

Mann-Kendall Test	
M-K Test Value (S)	-1312
Critical Value (0.05)	-1.645
Standard Deviation of S	222
Standardized Value of S	-5.904
Approximate p-value	1.7713E-9

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Carbon Tetrachloride



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	136.0723
Standardized Value of S	-1.0730
M-K Test Value (S)	-147
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1416

OLS Regression Line (Blue)

OLS Regression Slope	-0.0156
OLS Regression Intercept	4.5306

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-2 Carbon Tetrachloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:29:45 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CT

General Statistics

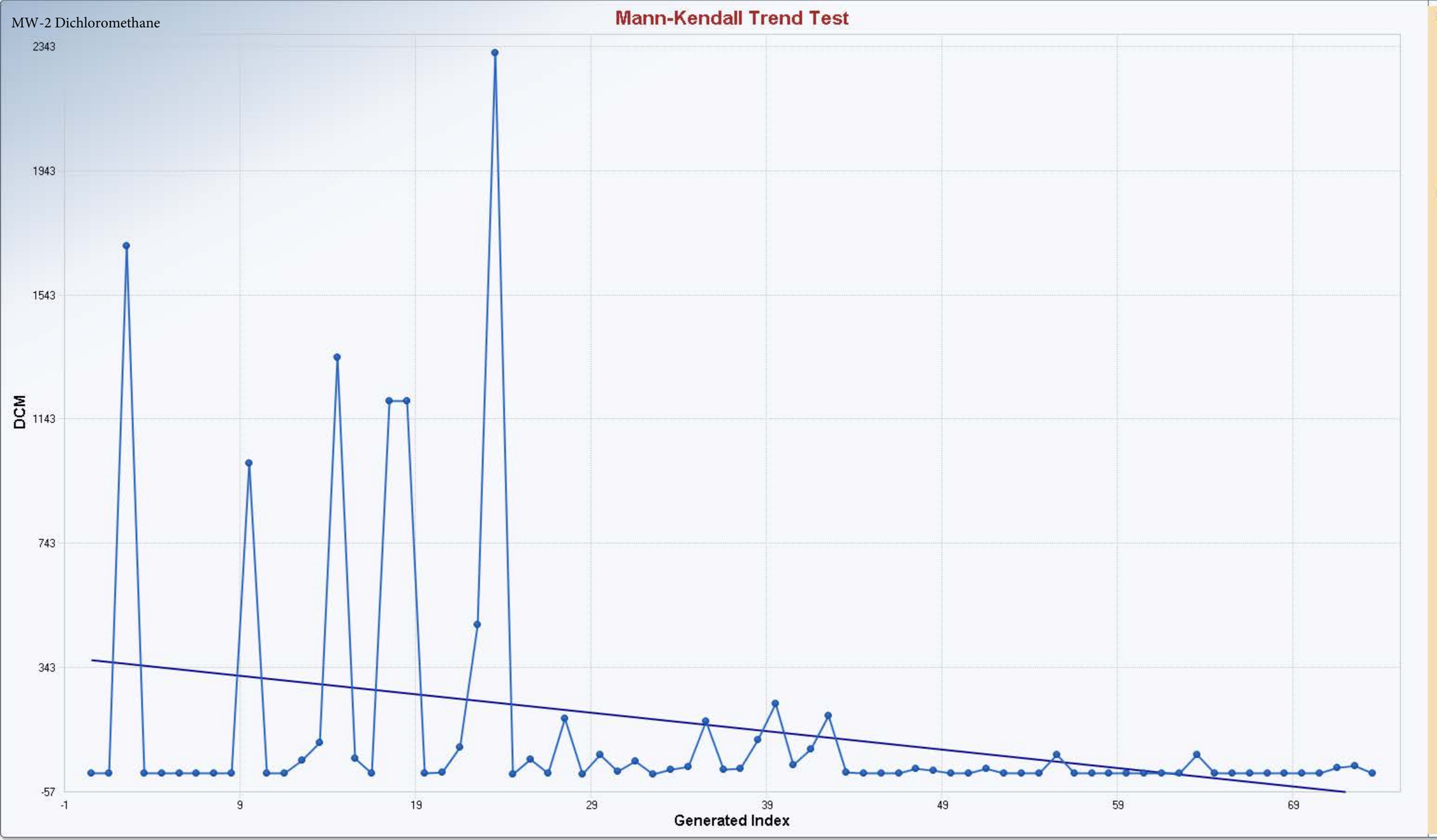
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	43
Mean	3.929
Geometric Mean	1.421
Median	1
Standard Deviation	9.048
Coefficient of Variation	2.303

Mann-Kendall Test

M-K Test Value (S)	-147
Critical Value (0.05)	-1.645
Standard Deviation of S	136.1
Standardized Value of S	-1.073
Approximate p-value	0.142

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-2 Dichloromethane



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	203.3740
Standardized Value of S	-2.0357
M-K Test Value (S)	-415
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0209

OLS Regression Line (Blue)

OLS Regression Slope	-5.9889
OLS Regression Intercept	373.2486

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:33:05 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

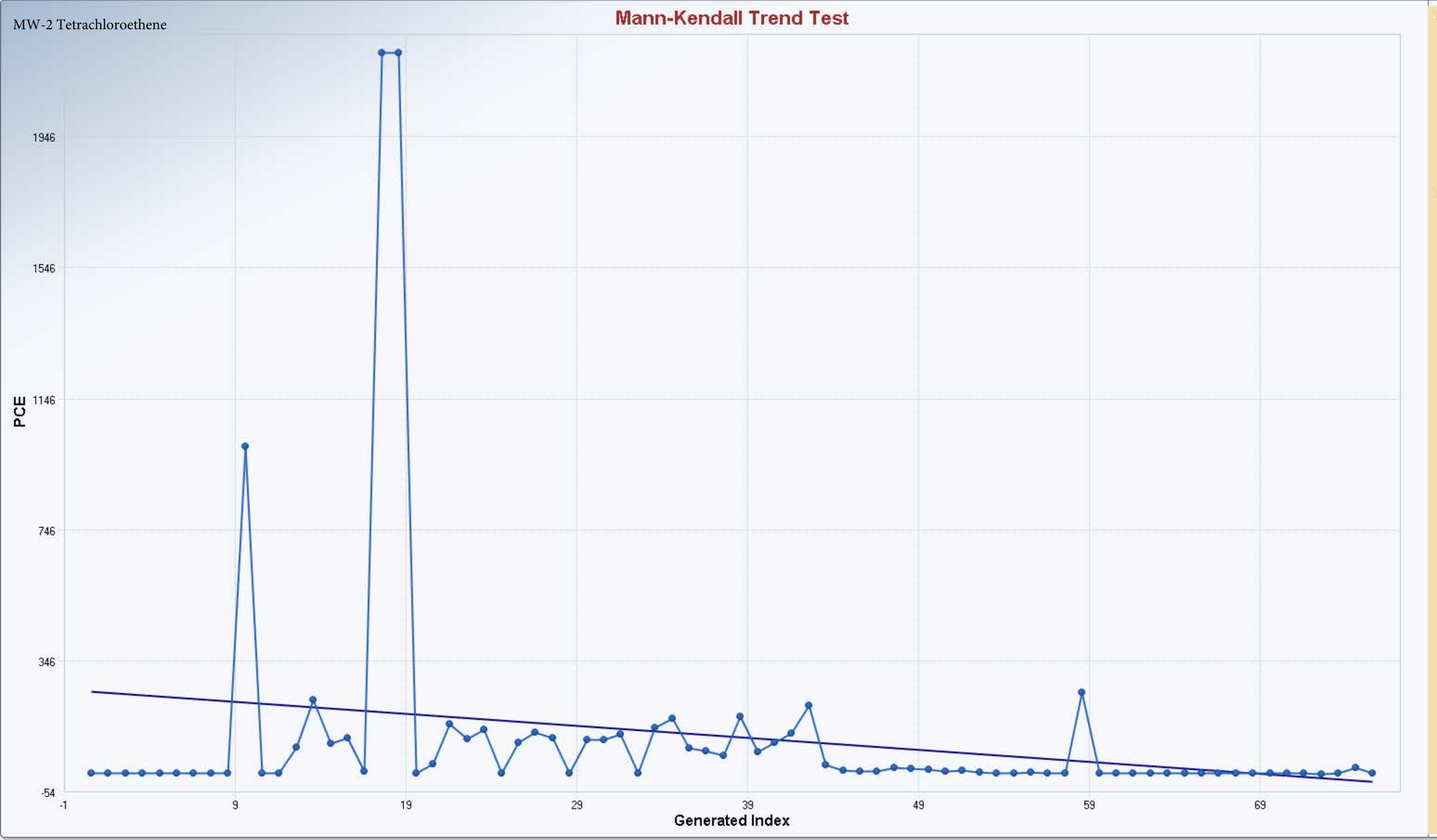
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	76
Number Values Missing	2
Number Values Used	74
Minimum	0.7
Maximum	2320
Mean	148.7
Geometric Mean	7.791
Median	1.45
Standard Deviation	417.9
Coefficient of Variation	2.811

Mann-Kendall Test

M-K Test Value (S)	-415
Critical Value (0.05)	-1.645
Standard Deviation of S	203.4
Standardized Value of S	-2.036
Approximate p-value	0.0209

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Tetrachloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	218.2964
Standardized Value of S	-2.7073
M-K Test Value (S)	-592
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0034

OLS Regression Line (Blue)

OLS Regression Slope	-3.6722
OLS Regression Intercept	254.9997

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:33:57 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

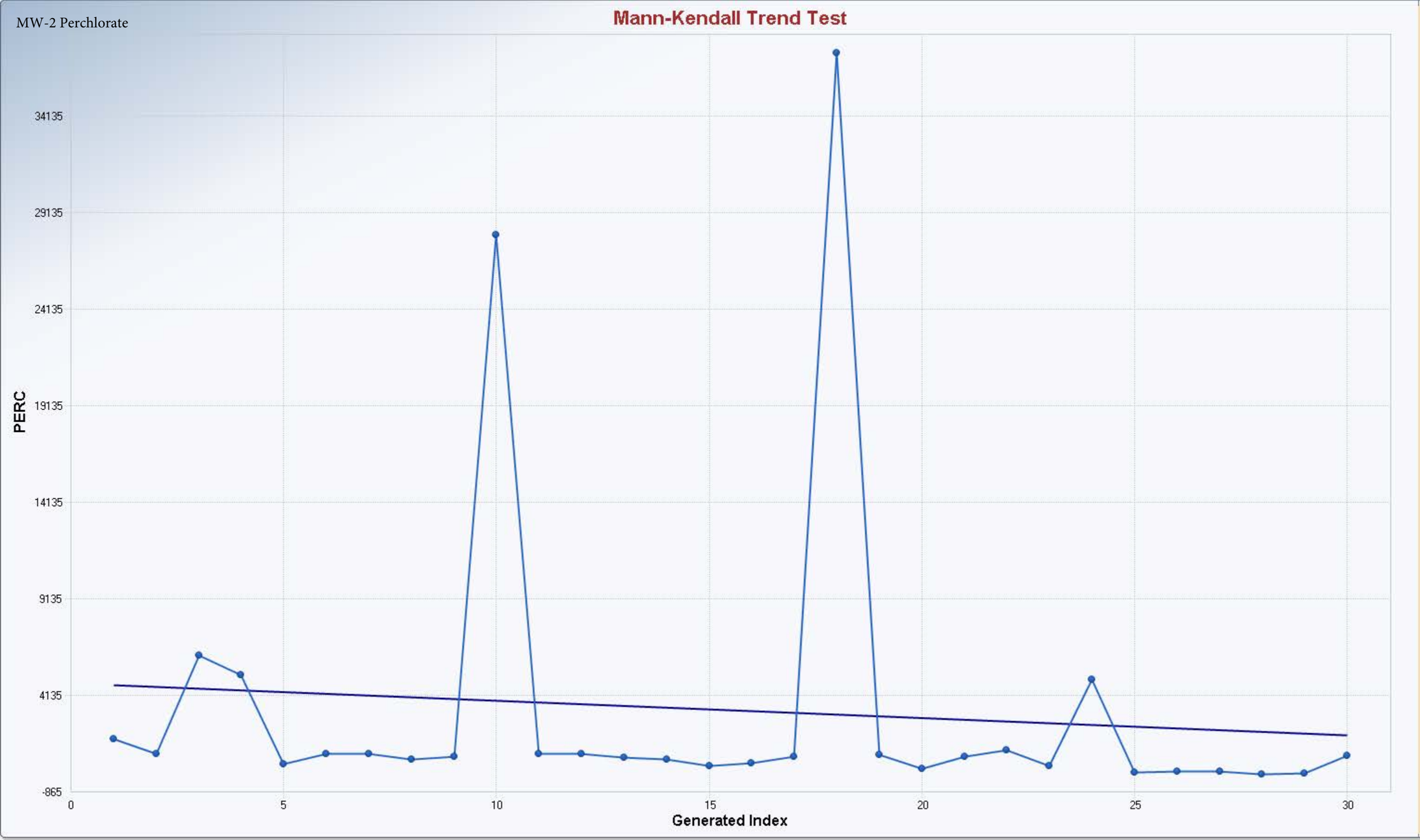
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	2200
Mean	113.6
Geometric Mean	10.23
Median	6.8
Standard Deviation	367.6
Coefficient of Variation	3.235

Mann-Kendall Test

M-K Test Value (S)	-592
Critical Value (0.05)	-1.645
Standard Deviation of S	218.3
Standardized Value of S	-2.707
Approximate p-value	0.00339

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Perchlorate



Mann-Kendall Trend Analysis	
n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	55.8928
Standardized Value of S	-3.1310
M-K Test Value (S)	-176
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0009

OLS Regression Line (Blue)	
OLS Regression Slope	-90.0020
OLS Regression Intercept	4,768.7310

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:35:41 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

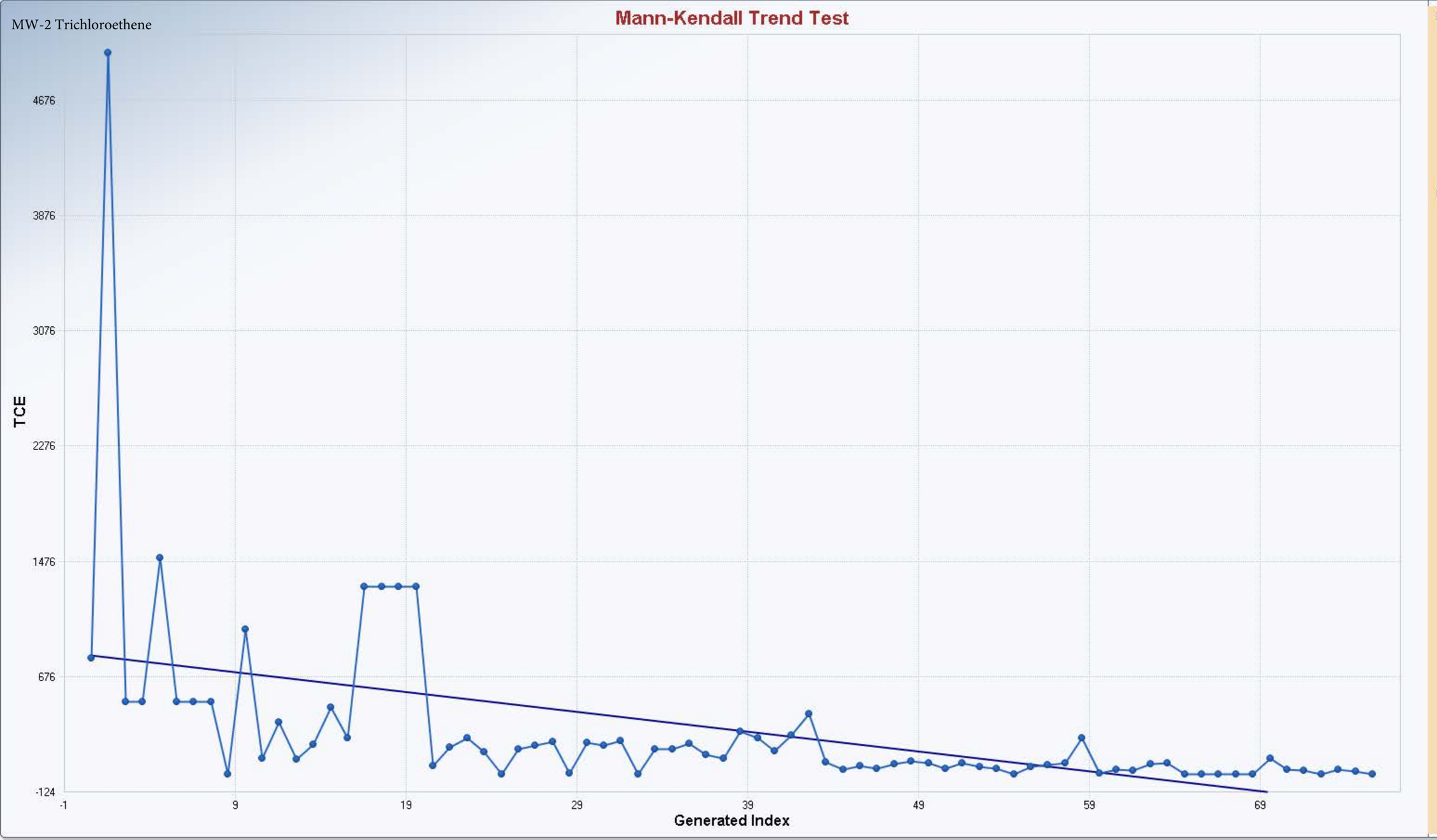
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	76
Number Values Missing	46
Number Values Used	30
Minimum	68
Maximum	37400
Mean	3374
Geometric Mean	972
Median	977.5
Standard Deviation	8203
Coefficient of Variation	2.431

Mann-Kendall Test

M-K Test Value (S)	-176
Critical Value (0.05)	-1.645
Standard Deviation of S	55.89
Standardized Value of S	-3.131
Approximate p-value	8.7107E-4

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Trichloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.6237
Standardized Value of S	-7.0837
M-K Test Value (S)	-1,578
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-13.8587
OLS Regression Intercept	836.7258

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-2 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:34:52 PM	
From File	MW-02_2.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

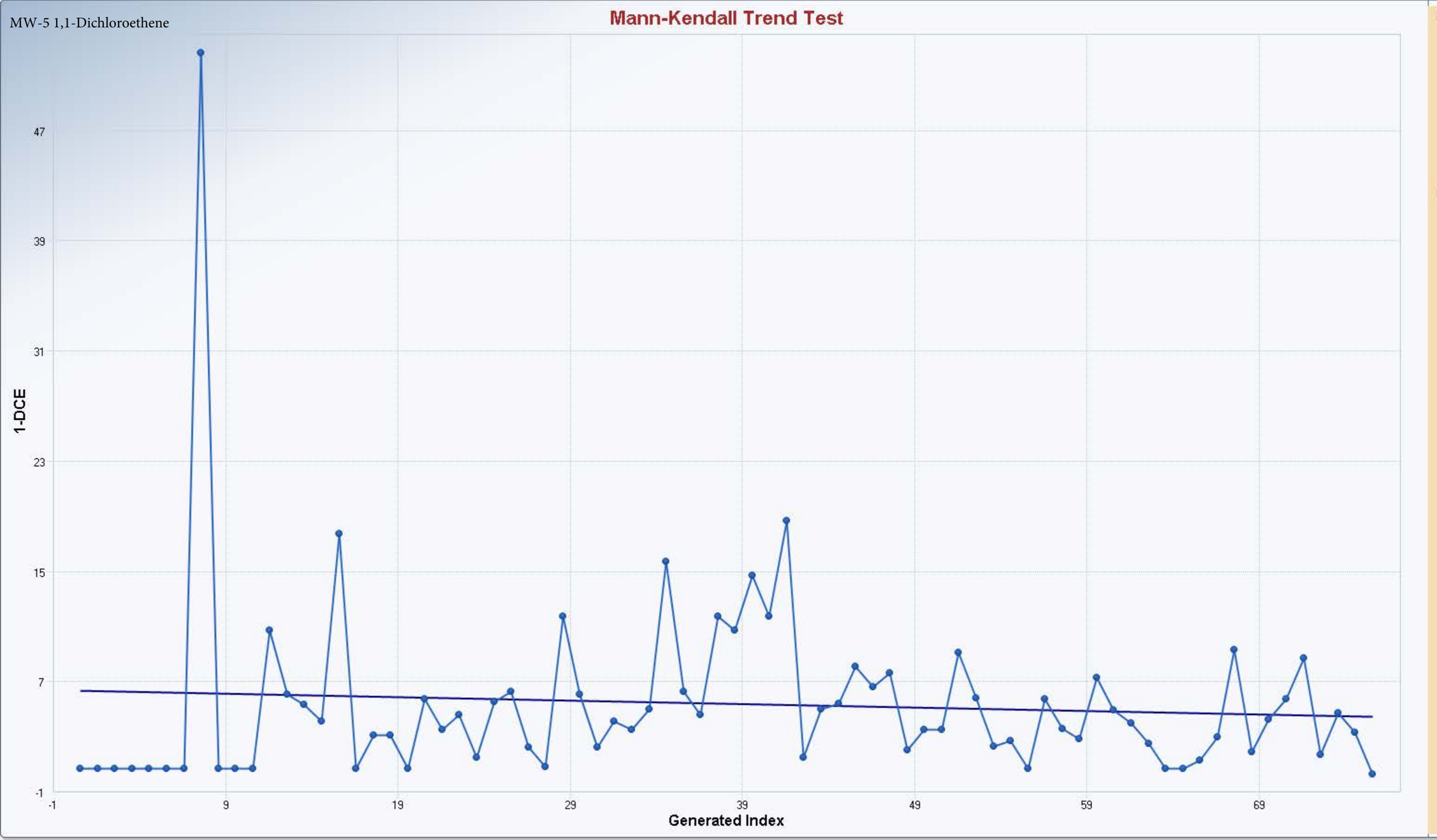
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	5000
Mean	303.2
Geometric Mean	69.02
Median	108.5
Standard Deviation	647.6
Coefficient of Variation	2.136

Mann-Kendall Test

M-K Test Value (S)	-1578
Critical Value (0.05)	-1.645
Standard Deviation of S	222.6
Standardized Value of S	-7.084
Approximate p-value	7.018E-13

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	221.9985
Standardized Value of S	1.1757
M-K Test Value (S)	262
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1199

OLS Regression Line (Blue)

OLS Regression Slope	-0.0251
OLS Regression Intercept	6.6361

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-5 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:39:59 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.6
Maximum	52.9
Mean	5.669
Geometric Mean	3.689
Median	4.1
Standard Deviation	6.877
Coefficient of Variation	1.213

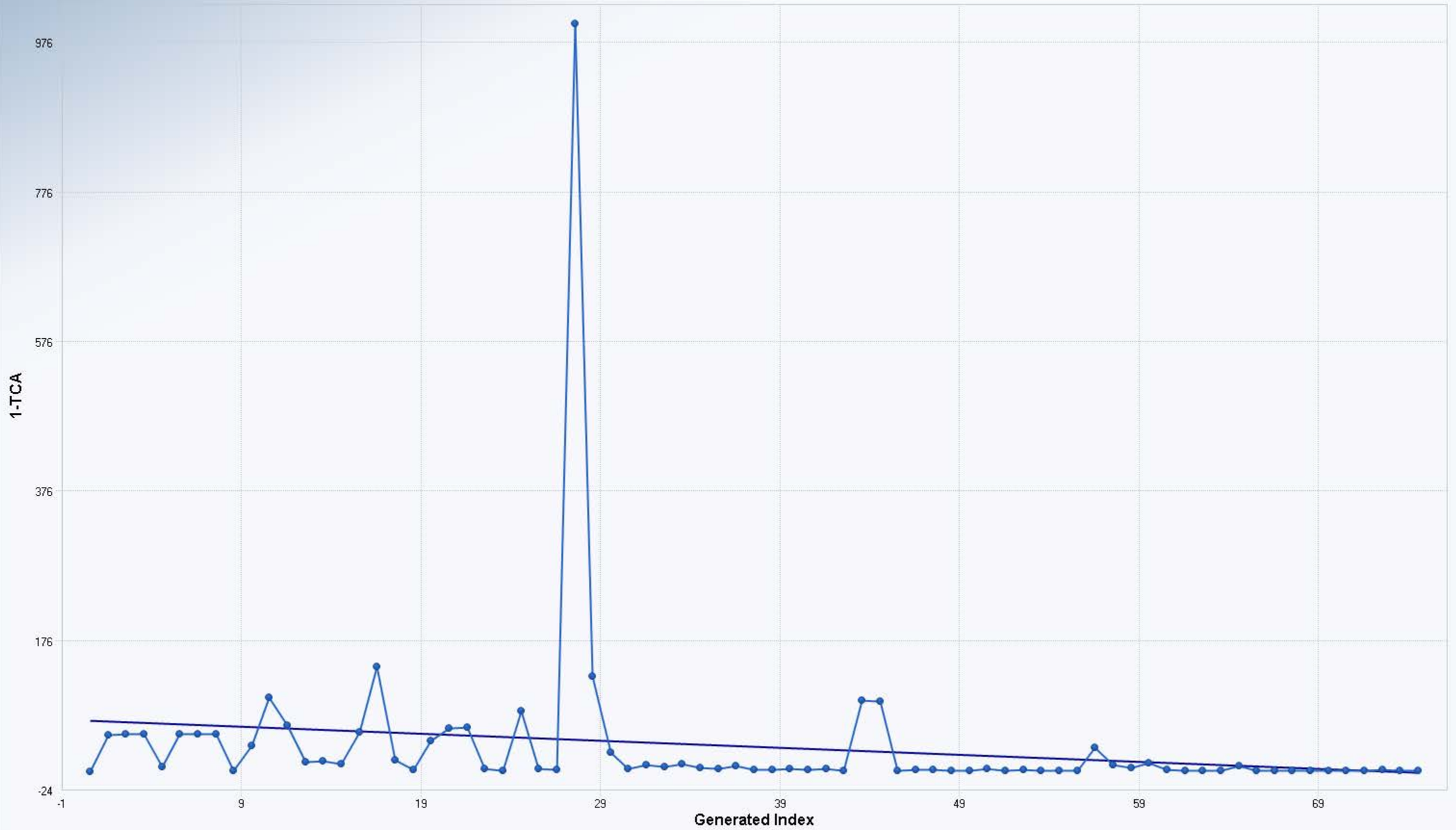
Mann-Kendall Test

M-K Test Value (S)	262
Critical Value (0.05)	1.645
Standard Deviation of S	222
Standardized Value of S	1.176
Approximate p-value	0.12

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-5 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	216.6818
Standardized Value of S	-5.6211
M-K Test Value (S)	-1,219
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.9330
OLS Regression Intercept	69.1177

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:38:53 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

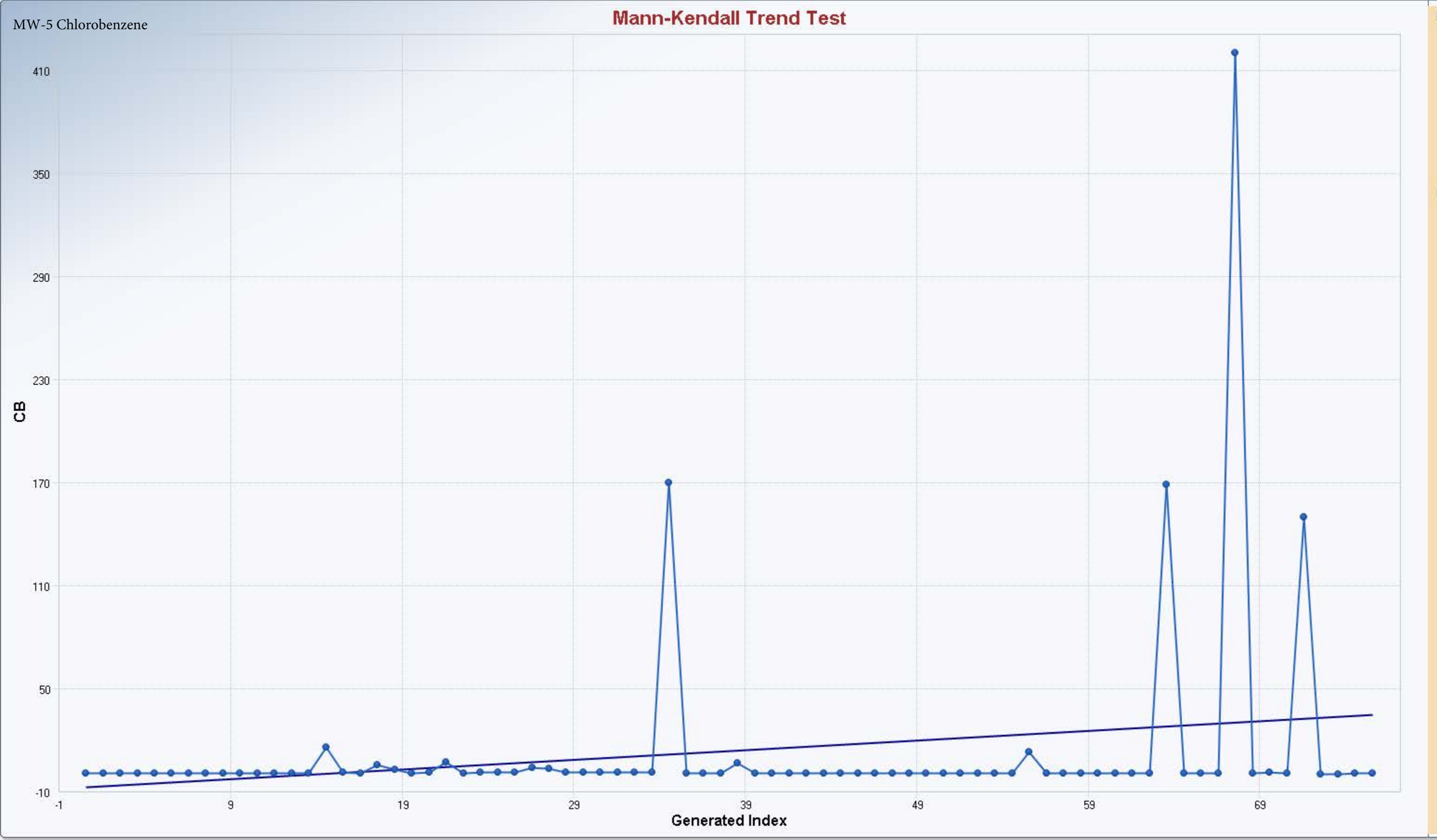
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	76
Number Values Missing	1
Number Values Used	75
Minimum	0.8
Maximum	1000
Mean	33.66
Geometric Mean	6.555
Median	3.9
Standard Deviation	117.5
Coefficient of Variation	3.489

Mann-Kendall Test

M-K Test Value (S)	-1219
Critical Value (0.05)	-1.645
Standard Deviation of S	216.7
Standardized Value of S	-5.621
Approximate p-value	9.4847E-9

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 Chlorobenzene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.0729
Standardized Value of S	-1.0777
M-K Test Value (S)	-208
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1406

OLS Regression Line (Blue)

OLS Regression Slope	0.5613
OLS Regression Intercept	-7.9827

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-5 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:40:59 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

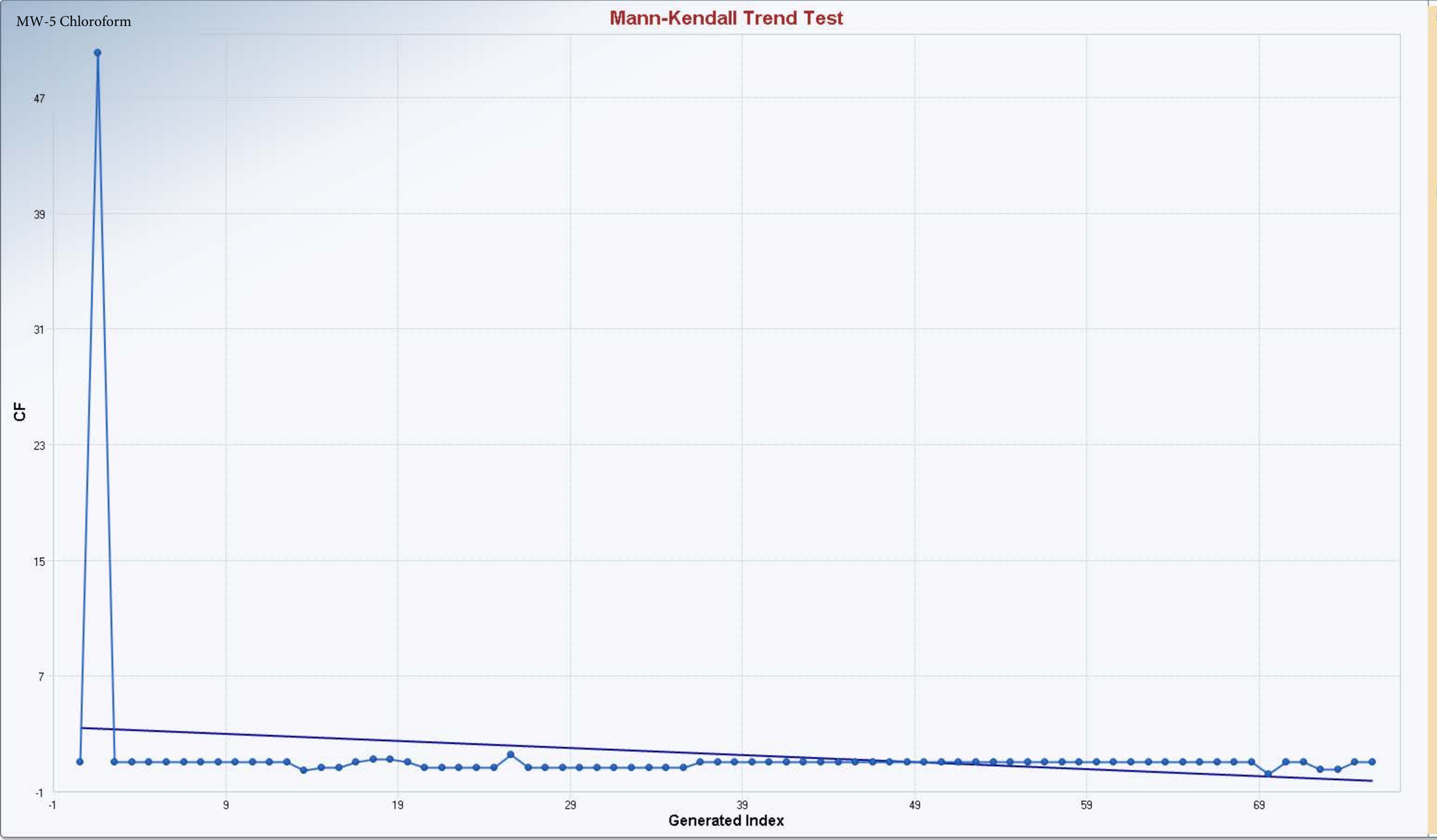
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.5
Maximum	420
Mean	13.63
Geometric Mean	1.66
Median	1
Standard Deviation	56.91
Coefficient of Variation	4.177

Mann-Kendall Test

M-K Test Value (S)	-208
Critical Value (0.05)	-1.645
Standard Deviation of S	192.1
Standardized Value of S	-1.078
Approximate p-value	0.141

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-5 Chloroform



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	184.3014
Standardized Value of S	0.4232
M-K Test Value (S)	79
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3361

OLS Regression Line (Blue)

OLS Regression Slope	-0.0484
OLS Regression Intercept	3.4000

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-5 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:42:00 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

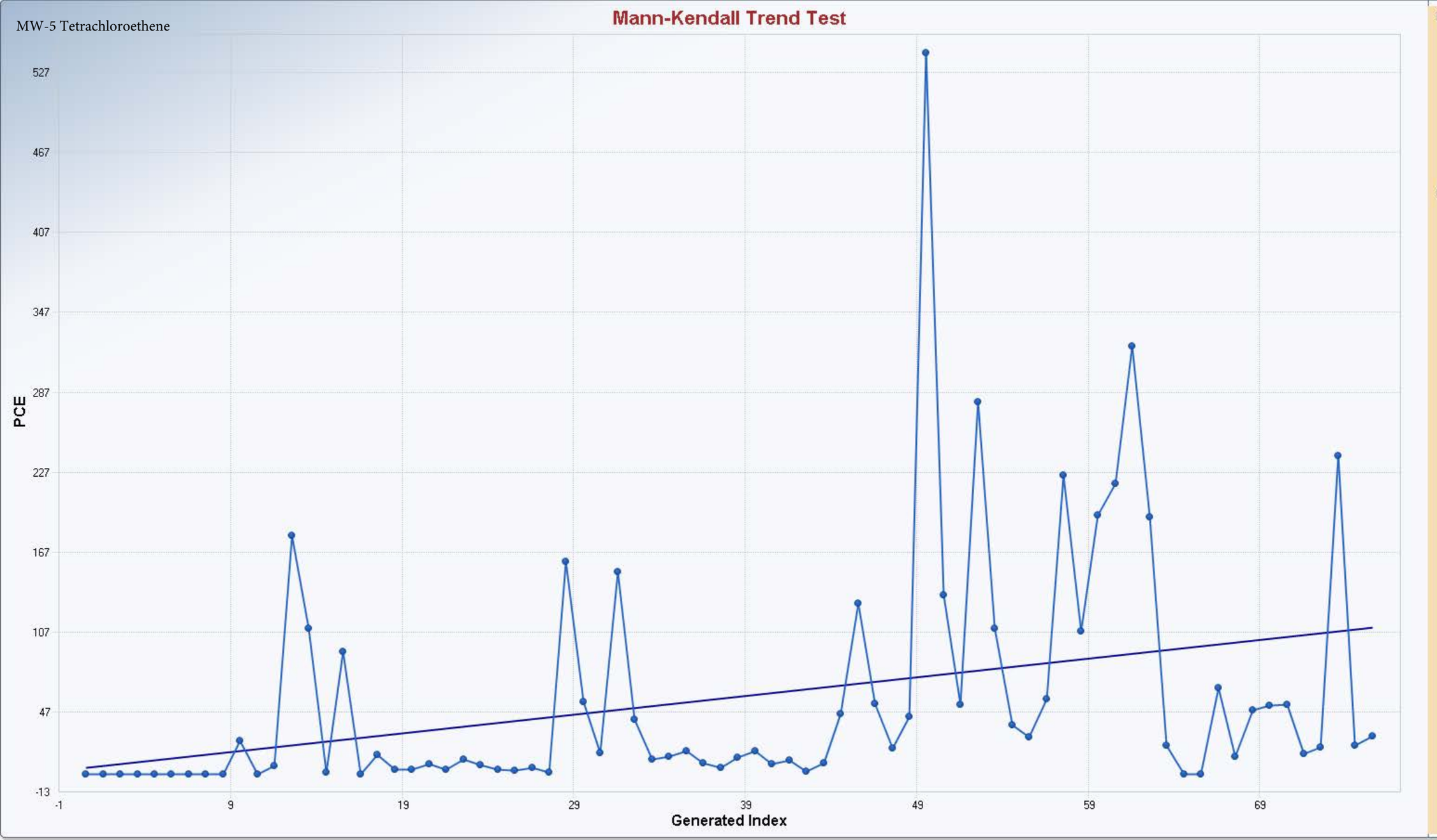
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	0.18
Maximum	50
Mean	1.535
Geometric Mean	0.9
Median	1
Standard Deviation	5.638
Coefficient of Variation	3.672

Mann-Kendall Test	
M-K Test Value (S)	79
Critical Value (0.05)	1.645
Standard Deviation of S	184.3
Standardized Value of S	0.423
Approximate p-value	0.336

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-5 Tetrachloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.3578
Standardized Value of S	5.3787
M-K Test Value (S)	1,197
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.4006
OLS Regression Intercept	4.4046

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-5 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:42:53 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

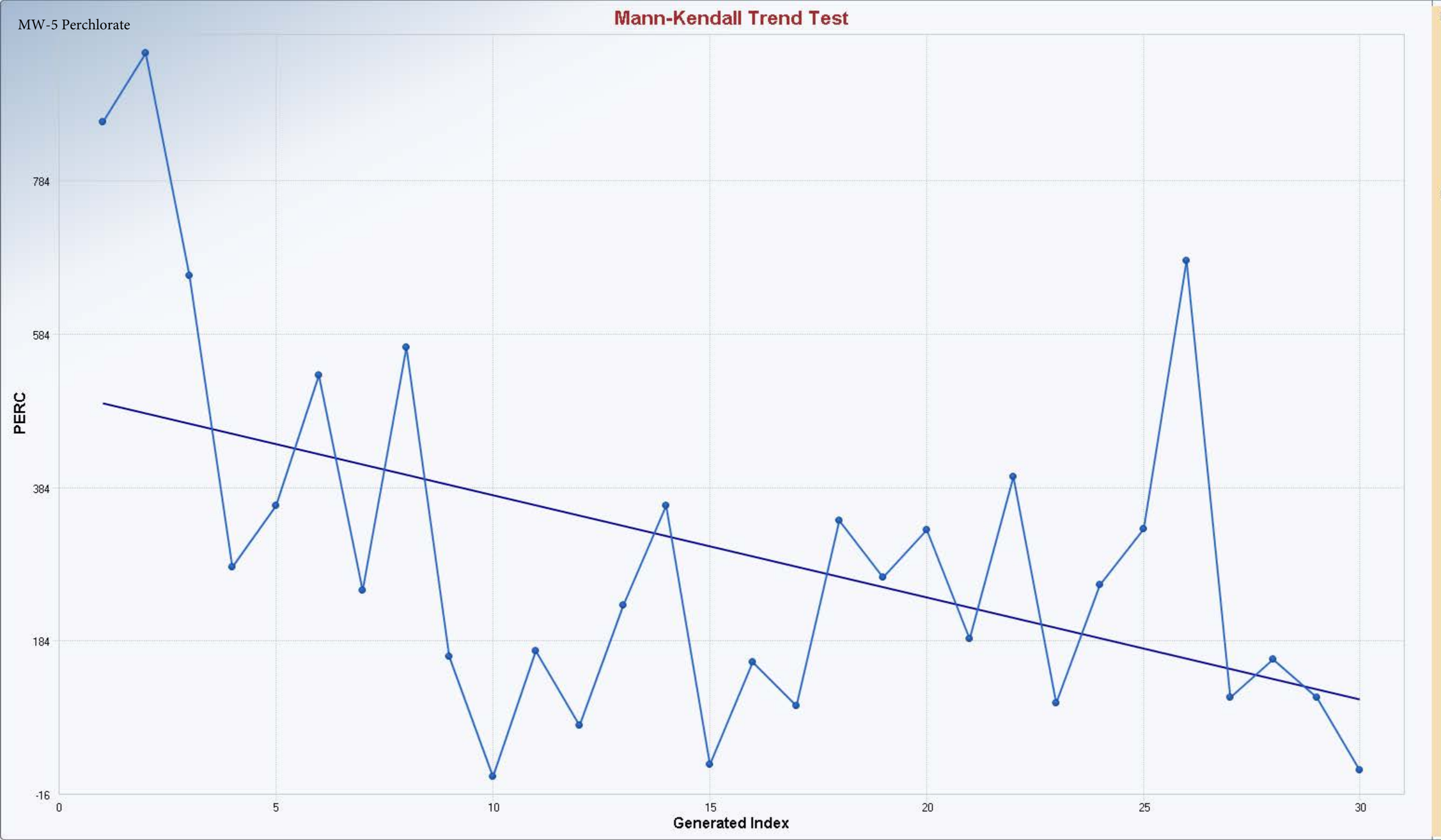
Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	1
Maximum	542
Mean	58.33
Geometric Mean	16.3
Median	17.5
Standard Deviation	92.99
Coefficient of Variation	1.594

Mann-Kendall Test

M-K Test Value (S)	1197
Critical Value (0.05)	1.645
Standard Deviation of S	222.4
Standardized Value of S	5.379
Approximate p-value	3.7509E-8

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-5 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-2.2487
M-K Test Value (S)	-127
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0123

OLS Regression Line (Blue)

OLS Regression Slope	-13.3117
OLS Regression Intercept	507.0347

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:44:58 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

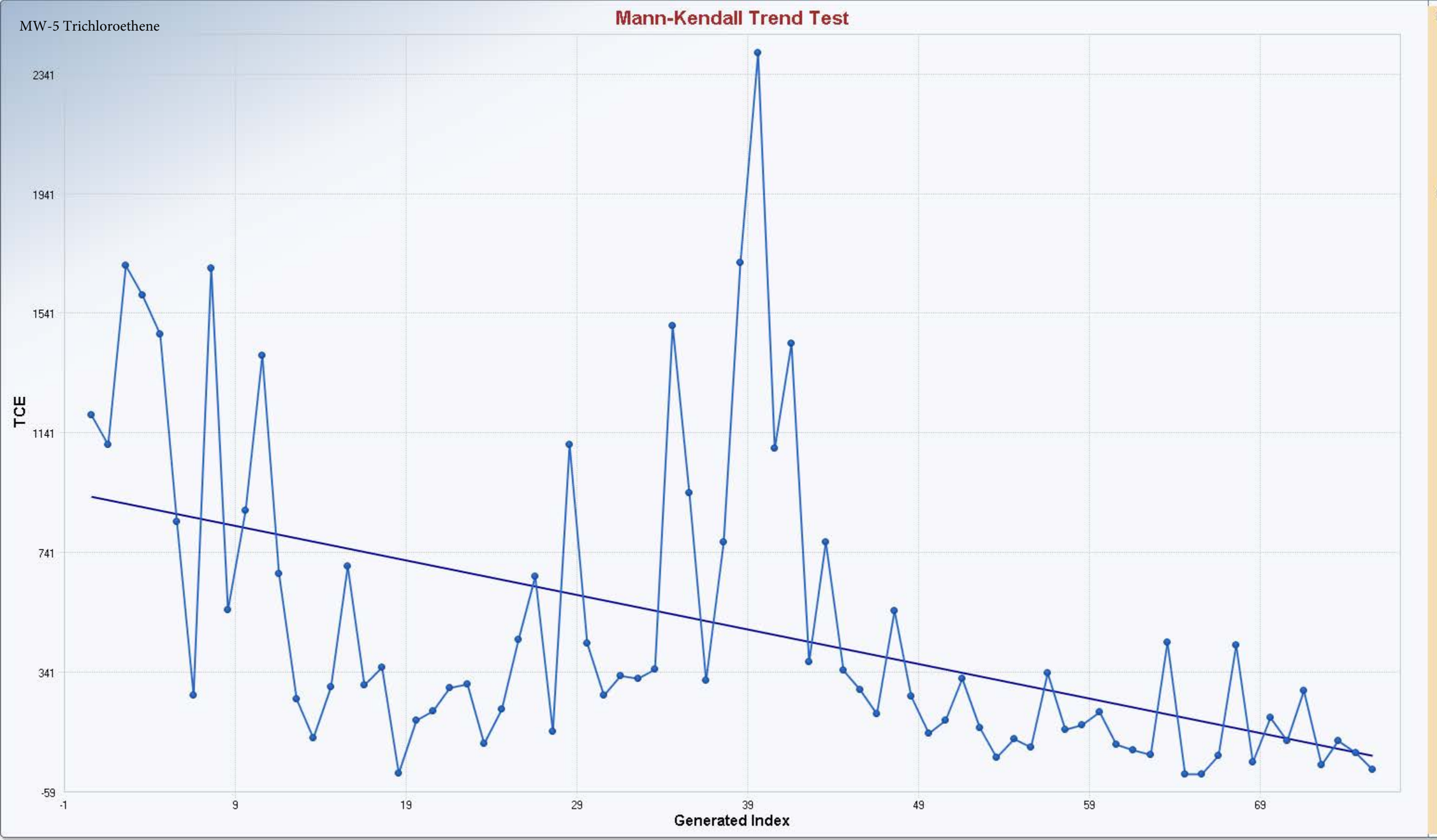
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	76
Number Values Missing	46
Number Values Used	30
Minimum	7.1
Maximum	950
Mean	300.7
Geometric Mean	196.5
Median	253.5
Standard Deviation	242.2
Coefficient of Variation	0.806

Mann-Kendall Test

M-K Test Value (S)	-127
Critical Value (0.05)	-1.645
Standard Deviation of S	56.03
Standardized Value of S	-2.249
Approximate p-value	0.0123

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 Trichloroethene



Mann-Kendall Trend Analysis

n	76
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	222.9634
Standardized Value of S	-5.4493
M-K Test Value (S)	-1,216
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-11.5479
OLS Regression Intercept	939.7402

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-5 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/2/2019 7:43:46 PM	
From File	MW-05.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	76
Number Values Reported (n)	76
Minimum	1
Maximum	2410
Mean	495.1
Geometric Mean	251
Median	295
Standard Deviation	523
Coefficient of Variation	1.056

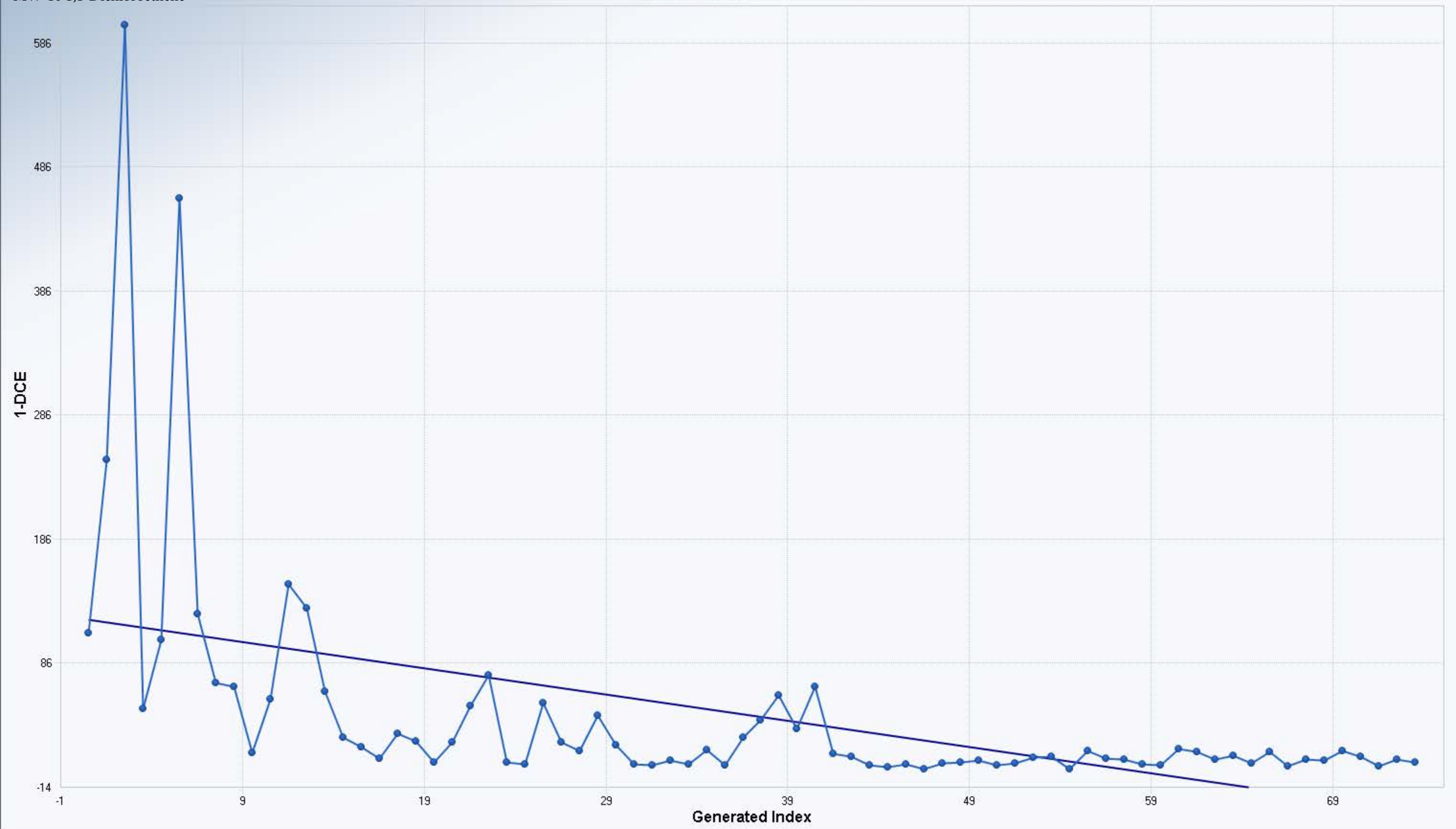
Mann-Kendall Test

M-K Test Value (S)	-1216
Critical Value (0.05)	-1.645
Standard Deviation of S	223
Standardized Value of S	-5.449
Approximate p-value	2.5281E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 1,1-Dichloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2615
Standardized Value of S	-5.5960
M-K Test Value (S)	-1,200
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.1225
OLS Regression Intercept	122.9228

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:17:10 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	1
Maximum	600
Mean	43.33
Geometric Mean	15.7
Median	13.5
Standard Deviation	92.58
Coefficient of Variation	2.137

Mann-Kendall Test

M-K Test Value (S)	-1200
Critical Value (0.05)	-1.645
Standard Deviation of S	214.3
Standardized Value of S	-5.596
Approximate p-value	1.0970E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 1,1,1-Trichloroethane

Mann-Kendall Trend Test

Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2576
Standardized Value of S	-7.3836
M-K Test Value (S)	-1,583
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-24.2535
OLS Regression Intercept	1,370.9131

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:15:52 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

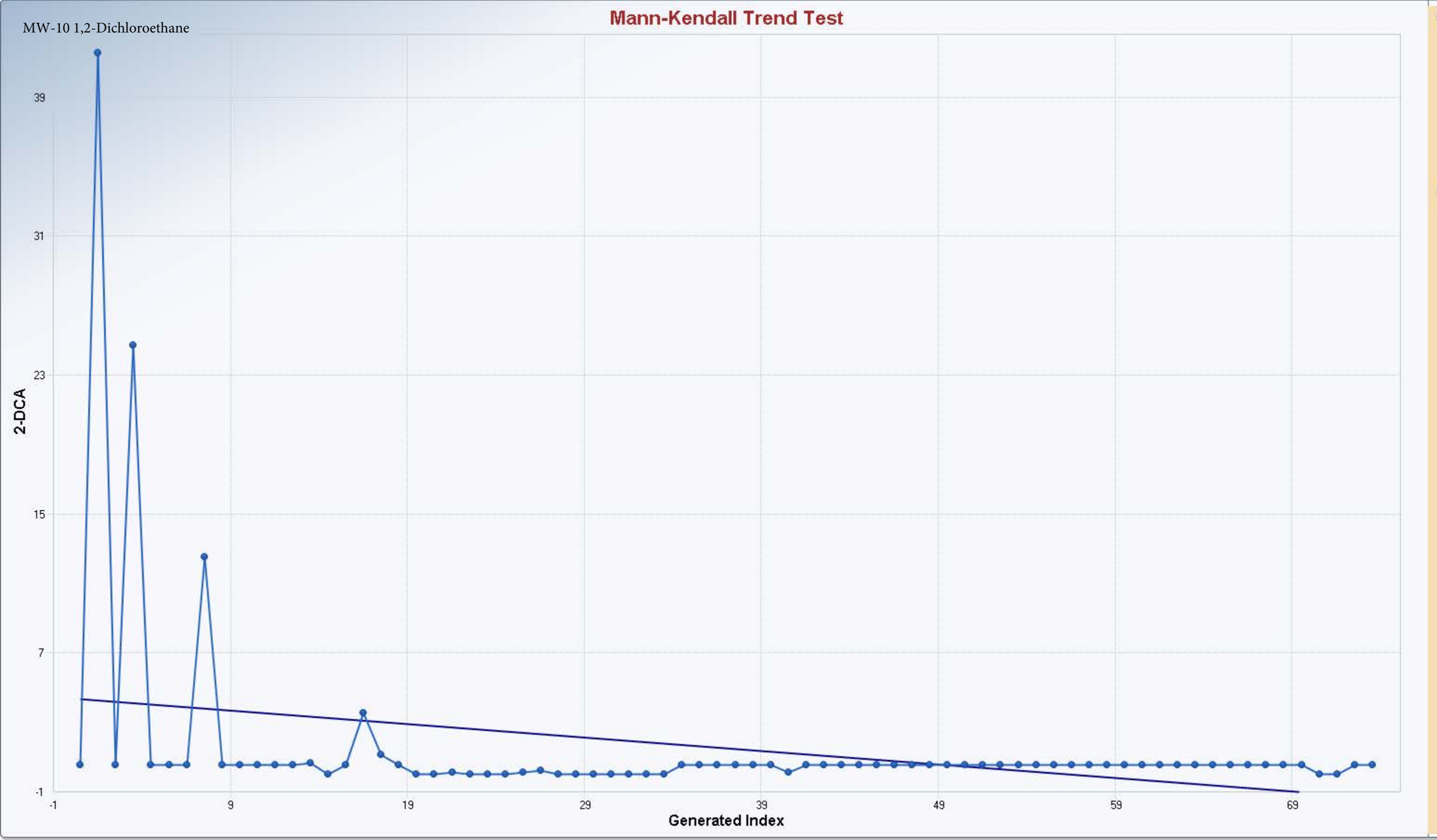
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.45
Maximum	4770
Mean	461.4
Geometric Mean	60.91
Median	38.85
Standard Deviation	810.3
Coefficient of Variation	1.756

Mann-Kendall Test

M-K Test Value (S)	-1583
Critical Value (0.05)	-1.645
Standard Deviation of S	214.3
Standardized Value of S	-7.384
Approximate p-value	7.701E-14

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 1,2-Dichloroethane



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	179.0149
Standardized Value of S	-0.0559
M-K Test Value (S)	-11
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4777

OLS Regression Line (Blue)

OLS Regression Slope	-0.0784
OLS Regression Intercept	4.9105

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-10 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:18:09 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

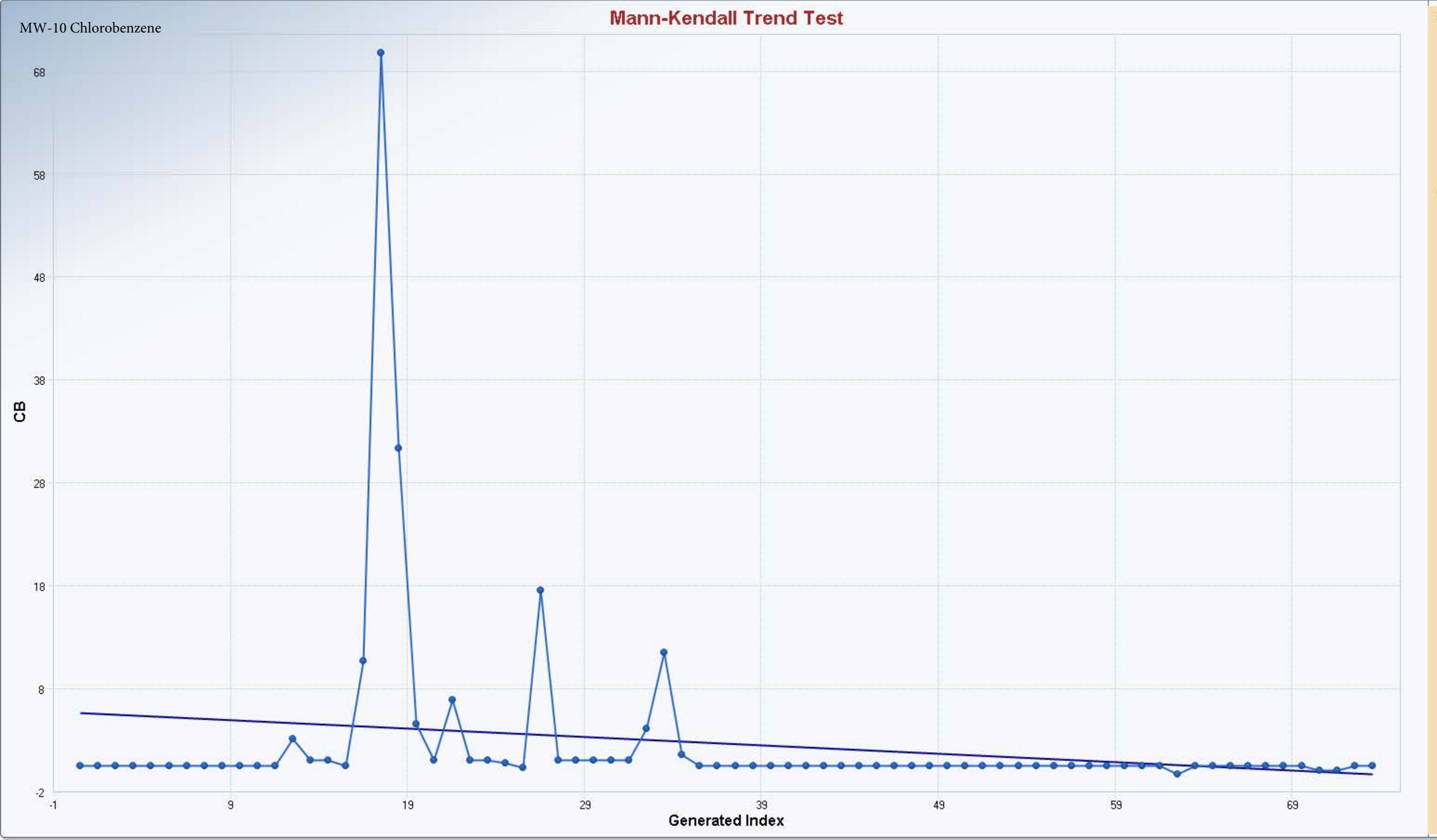
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.5
Maximum	42
Mean	1.972
Geometric Mean	0.989
Median	1
Standard Deviation	5.679
Coefficient of Variation	2.88

Mann-Kendall Test

M-K Test Value (S)	-11
Critical Value (0.05)	-1.645
Standard Deviation of S	179
Standardized Value of S	-0.0559
Approximate p-value	0.478

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-10 Chlorobenzene



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	179.8119
Standardized Value of S	-3.7372
M-K Test Value (S)	-673
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0805
OLS Regression Intercept	6.1690

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:21:22 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

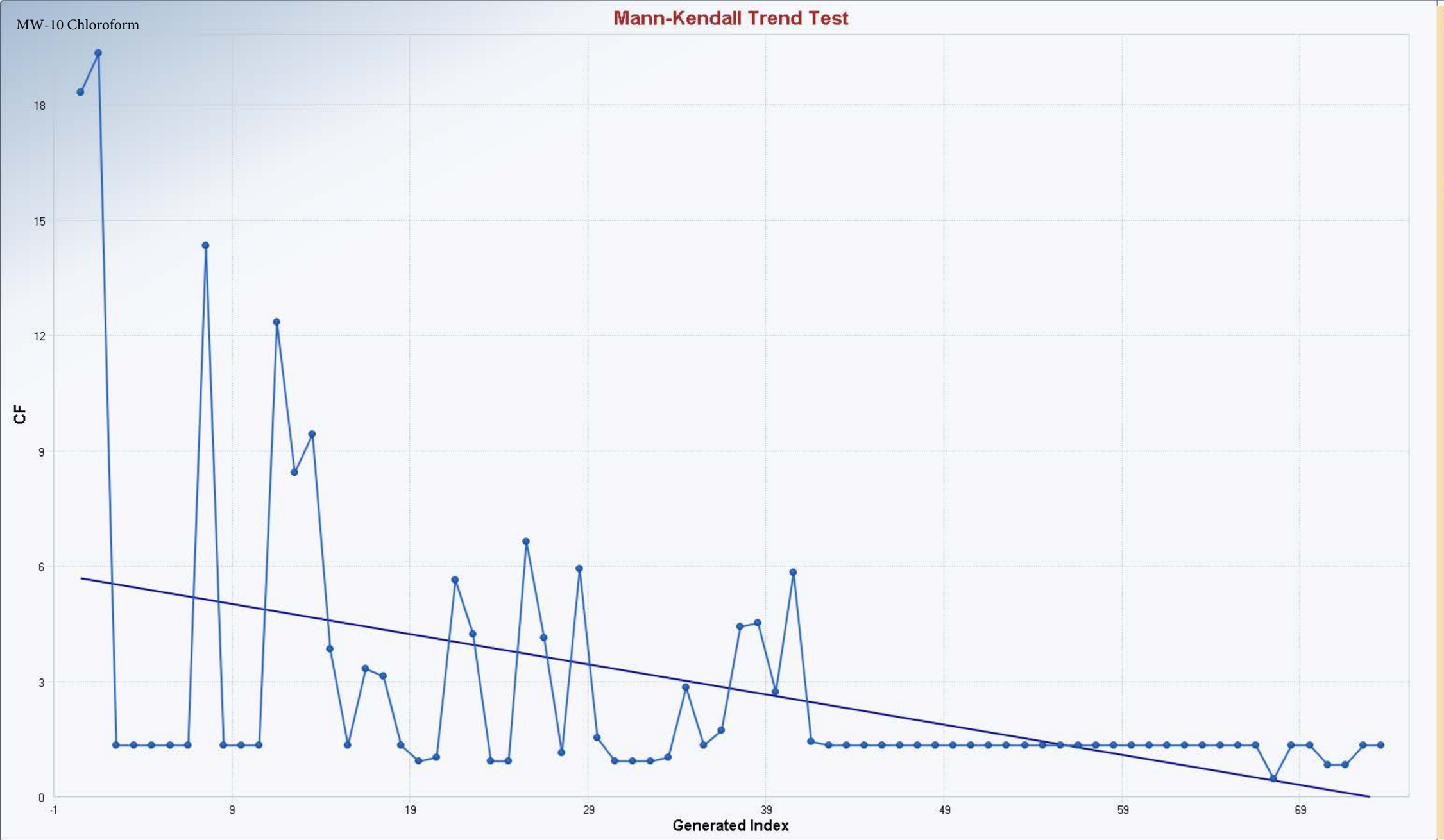
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.21
Maximum	70.2
Mean	3.151
Geometric Mean	1.38
Median	1
Standard Deviation	9.059
Coefficient of Variation	2.874

Mann-Kendall Test

M-K Test Value (S)	-673
Critical Value (0.05)	-1.645
Standard Deviation of S	179.8
Standardized Value of S	-3.737
Approximate p-value	9.3026E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Chloroform



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	196.2651
Standardized Value of S	-3.3577
M-K Test Value (S)	-660
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-0.0790
OLS Regression Intercept	5.4441

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:30:57 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

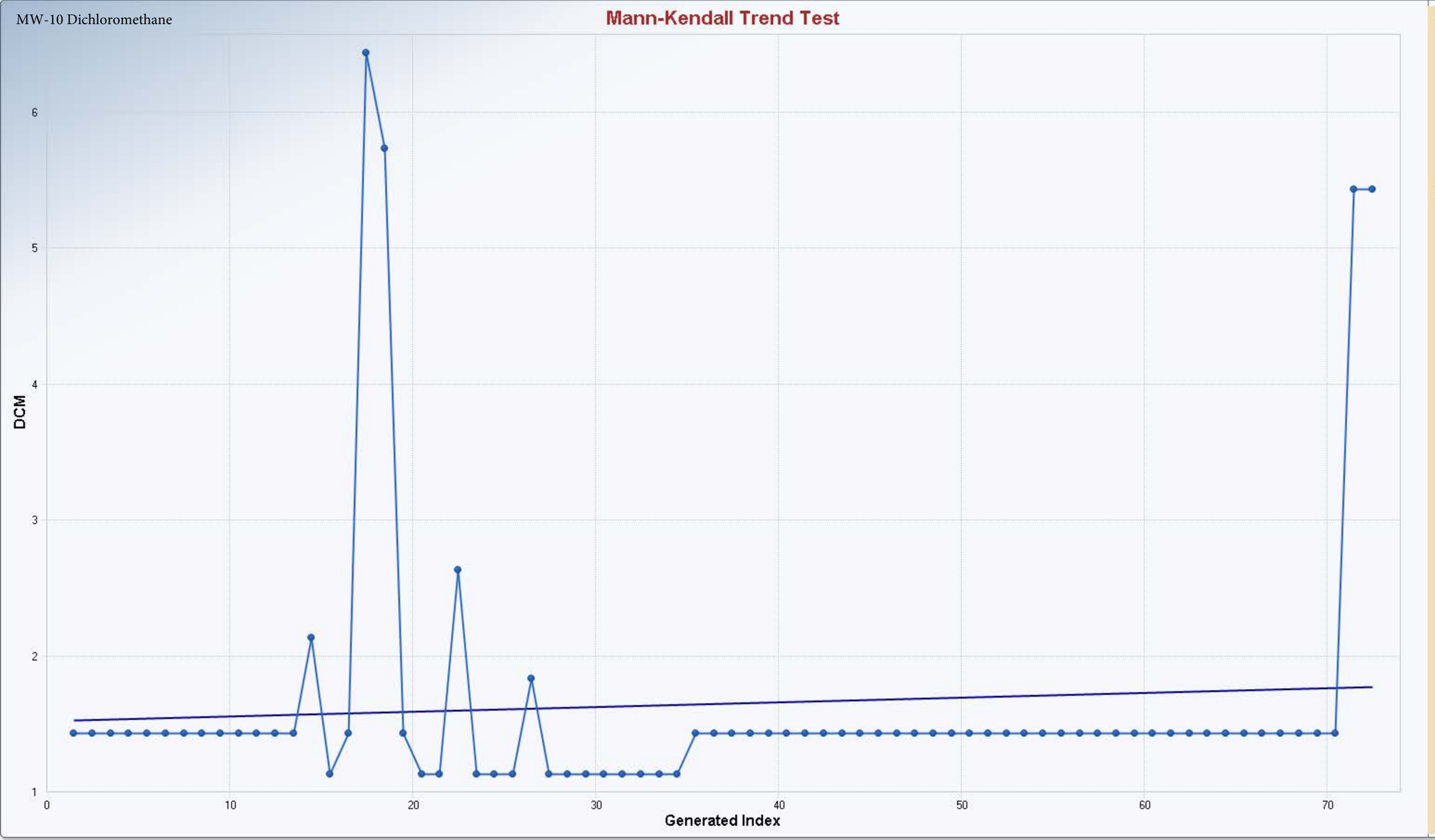
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.14
Maximum	19
Mean	2.483
Geometric Mean	1.424
Median	1
Standard Deviation	3.702
Coefficient of Variation	1.491

Mann-Kendall Test	
M-K Test Value (S)	-660
Critical Value (0.05)	-1.645
Standard Deviation of S	196.3
Standardized Value of S	-3.358
Approximate p-value	3.9297E-4

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Dichloromethane



Mann-Kendall Trend Analysis

n	72
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	163.7773
Standardized Value of S	1.6119
M-K Test Value (S)	265
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0535

OLS Regression Line (Blue)

OLS Regression Slope	0.0035
OLS Regression Intercept	1.0879

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-10 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:33:29 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

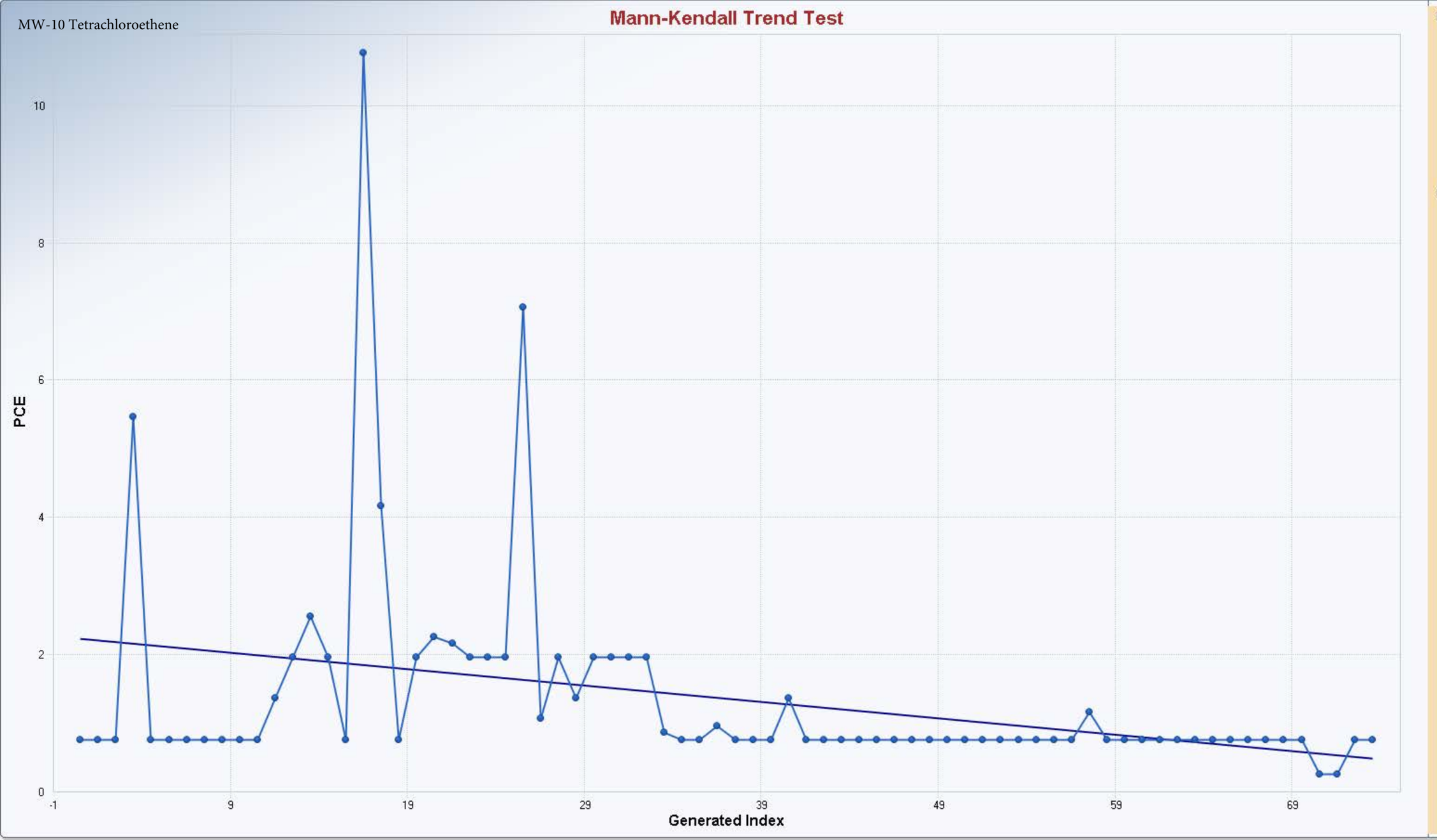
Number or Reported Events Not Used	0
Number of Generated Events	72
Number Values Reported (n)	74
Number Values Missing	2
Number Values Used	72
Minimum	0.7
Maximum	6
Mean	1.214
Geometric Mean	1.047
Median	1
Standard Deviation	1.032
Coefficient of Variation	0.85

Mann-Kendall Test

M-K Test Value (S)	265
Critical Value (0.05)	1.645
Standard Deviation of S	163.8
Standardized Value of S	1.612
Approximate p-value	0.0535

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-10 Tetrachloroethene



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	184.0009
Standardized Value of S	-4.4348
M-K Test Value (S)	-817
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0238
OLS Regression Intercept	2.4888

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:34:42 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

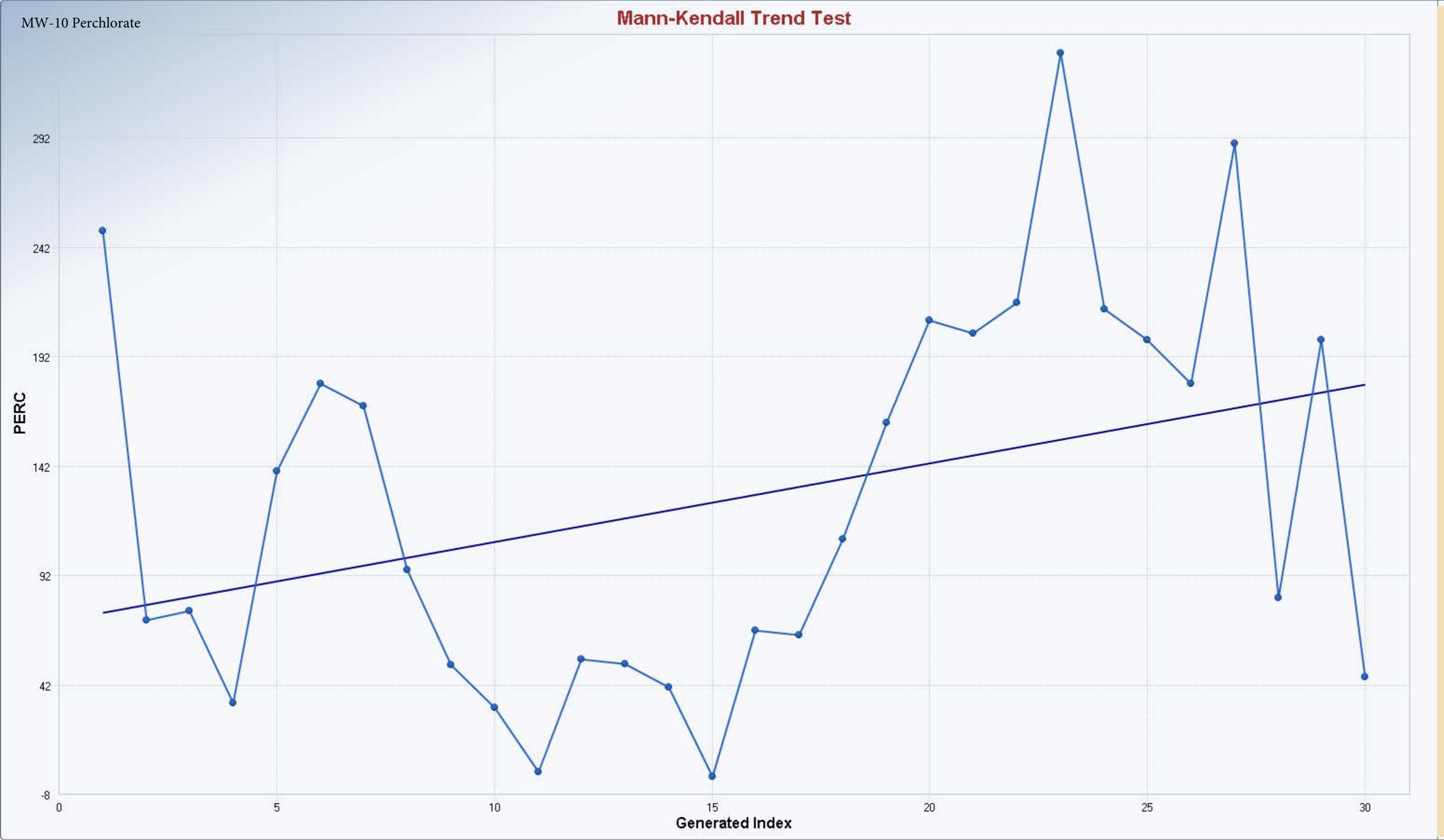
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.5
Maximum	11
Mean	1.596
Geometric Mean	1.31
Median	1
Standard Deviation	1.536
Coefficient of Variation	0.962

Mann-Kendall Test

M-K Test Value (S)	-817
Critical Value (0.05)	-1.645
Standard Deviation of S	184
Standardized Value of S	-4.435
Approximate p-value	4.6087E-6

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	1.7490
M-K Test Value (S)	99
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0401

OLS Regression Line (Blue)

OLS Regression Slope	3.5948
OLS Regression Intercept	71.7940

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-10 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:37:20 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

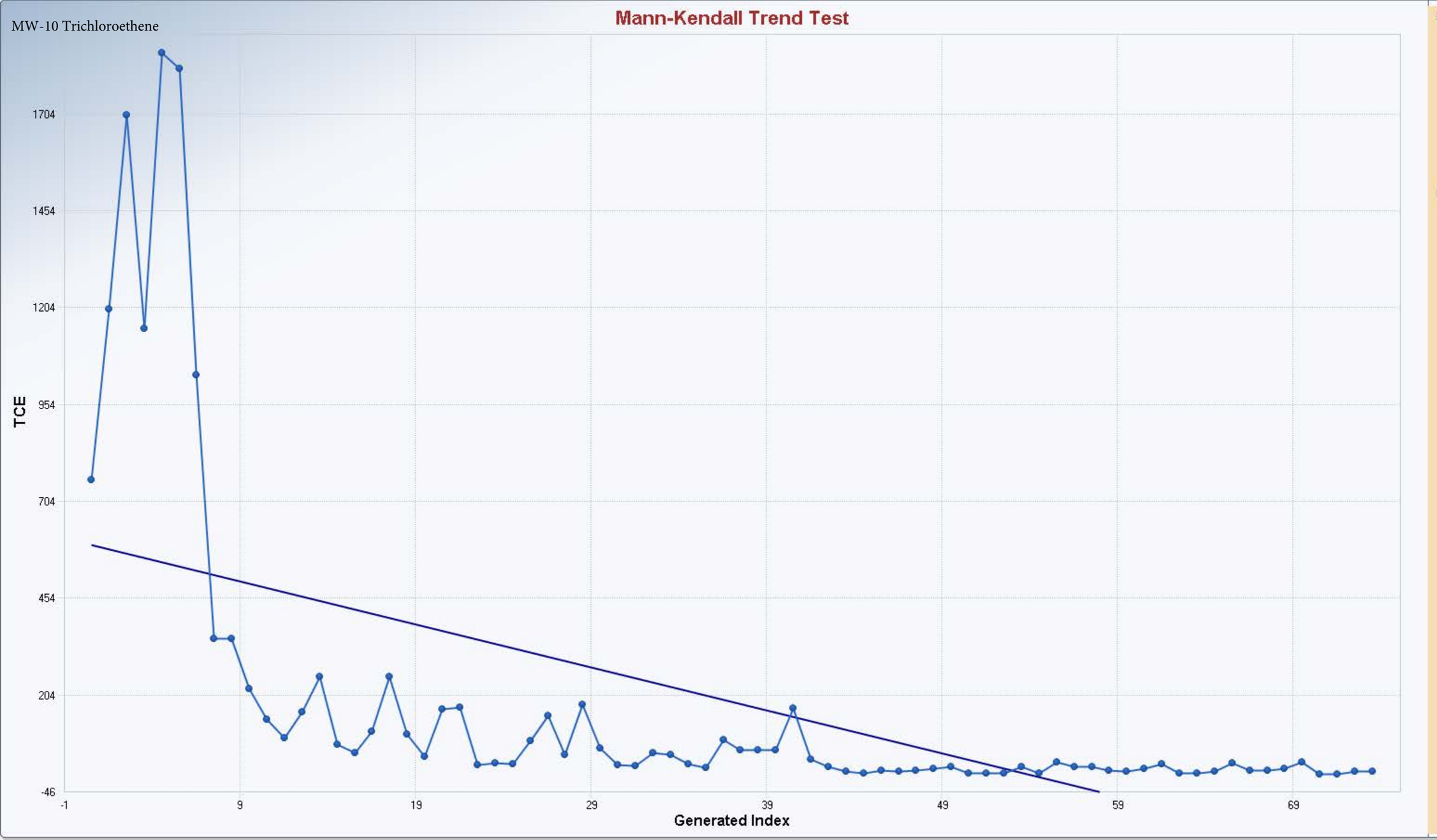
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	74
Number Values Missing	44
Number Values Used	30
Minimum	0.5
Maximum	331
Mean	127.5
Geometric Mean	81.06
Median	101.9
Standard Deviation	88.52
Coefficient of Variation	0.694

Mann-Kendall Test

M-K Test Value (S)	99
Critical Value (0.05)	1.645
Standard Deviation of S	56.03
Standardized Value of S	1.749
Approximate p-value	0.0401

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-10 Trichloroethene



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2001
Standardized Value of S	-8.1699
M-K Test Value (S)	-1,751
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-11.1266
OLS Regression Intercept	602.2277

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-10 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:36:26 AM	
From File	MW-10.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

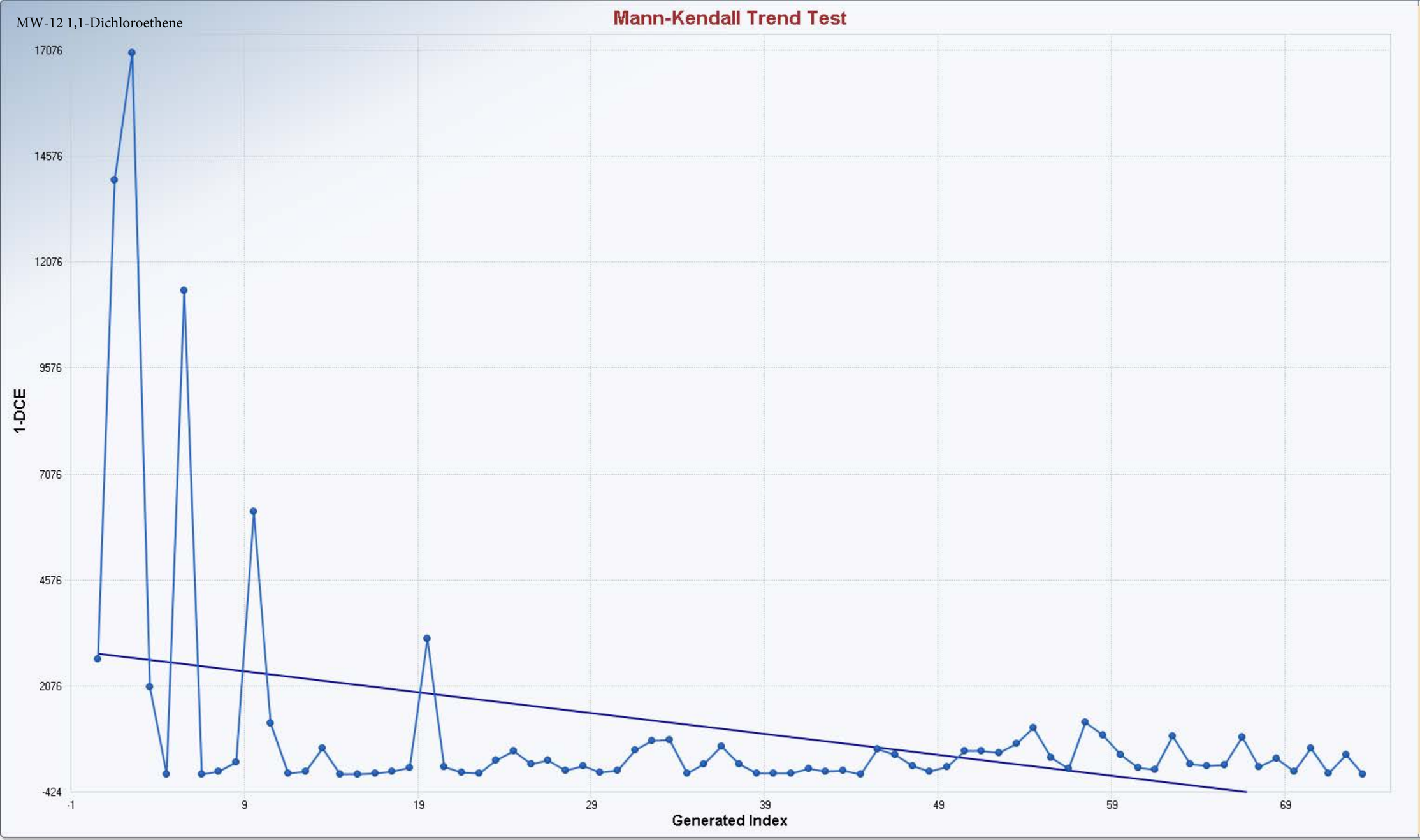
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	74
Minimum	0.5
Maximum	1860
Mean	185
Geometric Mean	33.84
Median	29
Standard Deviation	409.3
Coefficient of Variation	2.213

Mann-Kendall Test

M-K Test Value (S)	-1751
Critical Value (0.05)	-1.645
Standard Deviation of S	214.2
Standardized Value of S	-8.17
Approximate p-value	1.543E-16

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 1,1-Dichloroethene



Mann-Kendall Trend Analysis	
n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2390
Standardized Value of S	0.1400
M-K Test Value (S)	31
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4443

OLS Regression Line (Blue)	
OLS Regression Slope	-49.4711
OLS Regression Intercept	2,893.4239

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:48:33 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	75
Number Values Missing	1
Number Values Used	74
Minimum	1
Maximum	17000
Mean	1038
Geometric Mean	153.2
Median	221.5
Standard Deviation	2887
Coefficient of Variation	2.78

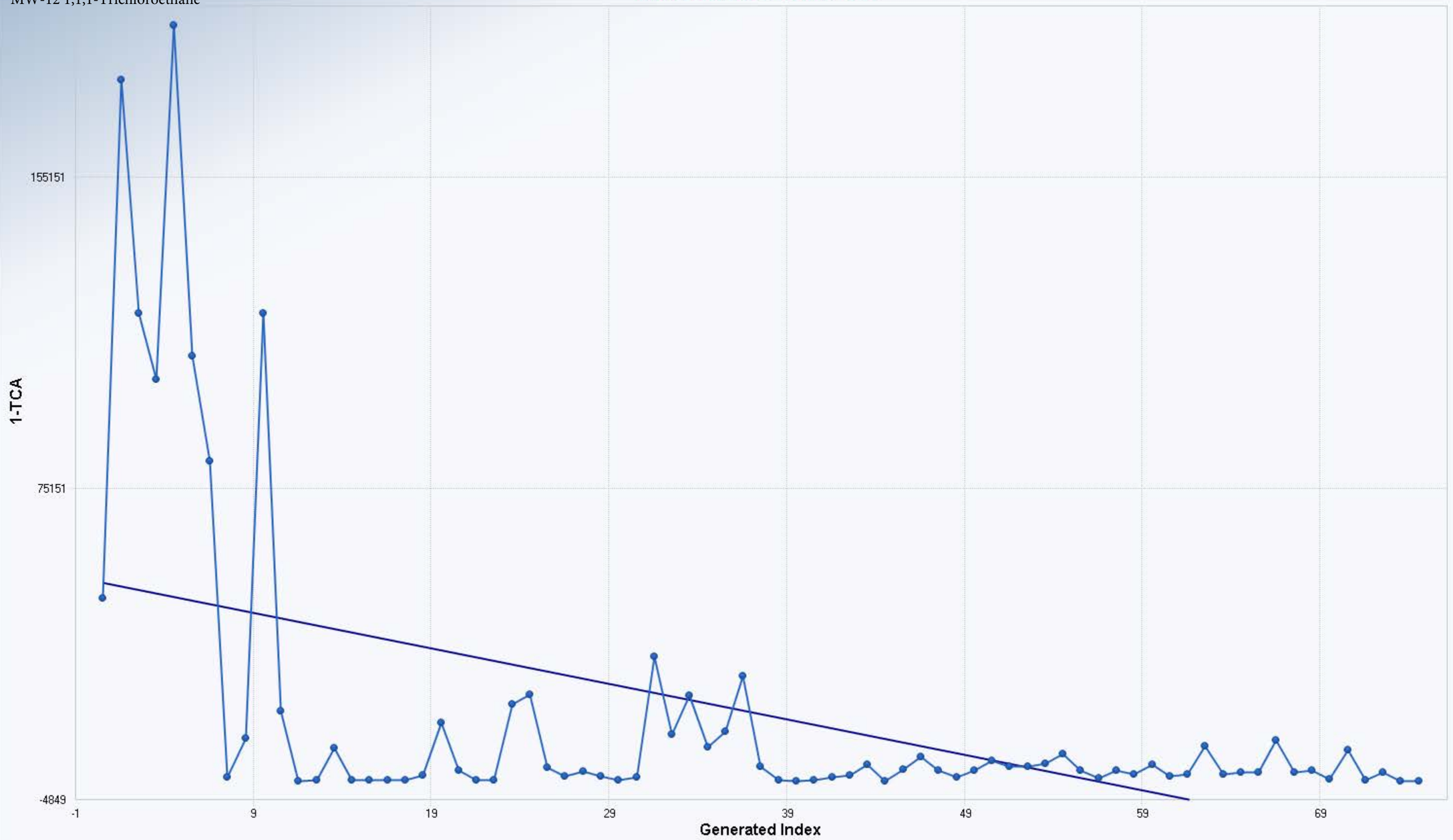
Mann-Kendall Test

M-K Test Value (S)	31
Critical Value (0.05)	1.645
Standard Deviation of S	214.2
Standardized Value of S	0.14
Approximate p-value	0.444

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	218.5955
Standardized Value of S	-2.4749
M-K Test Value (S)	-542
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0067

OLS Regression Line (Blue)

OLS Regression Slope	-914.7603
OLS Regression Intercept	51,863.6676

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:43:00 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

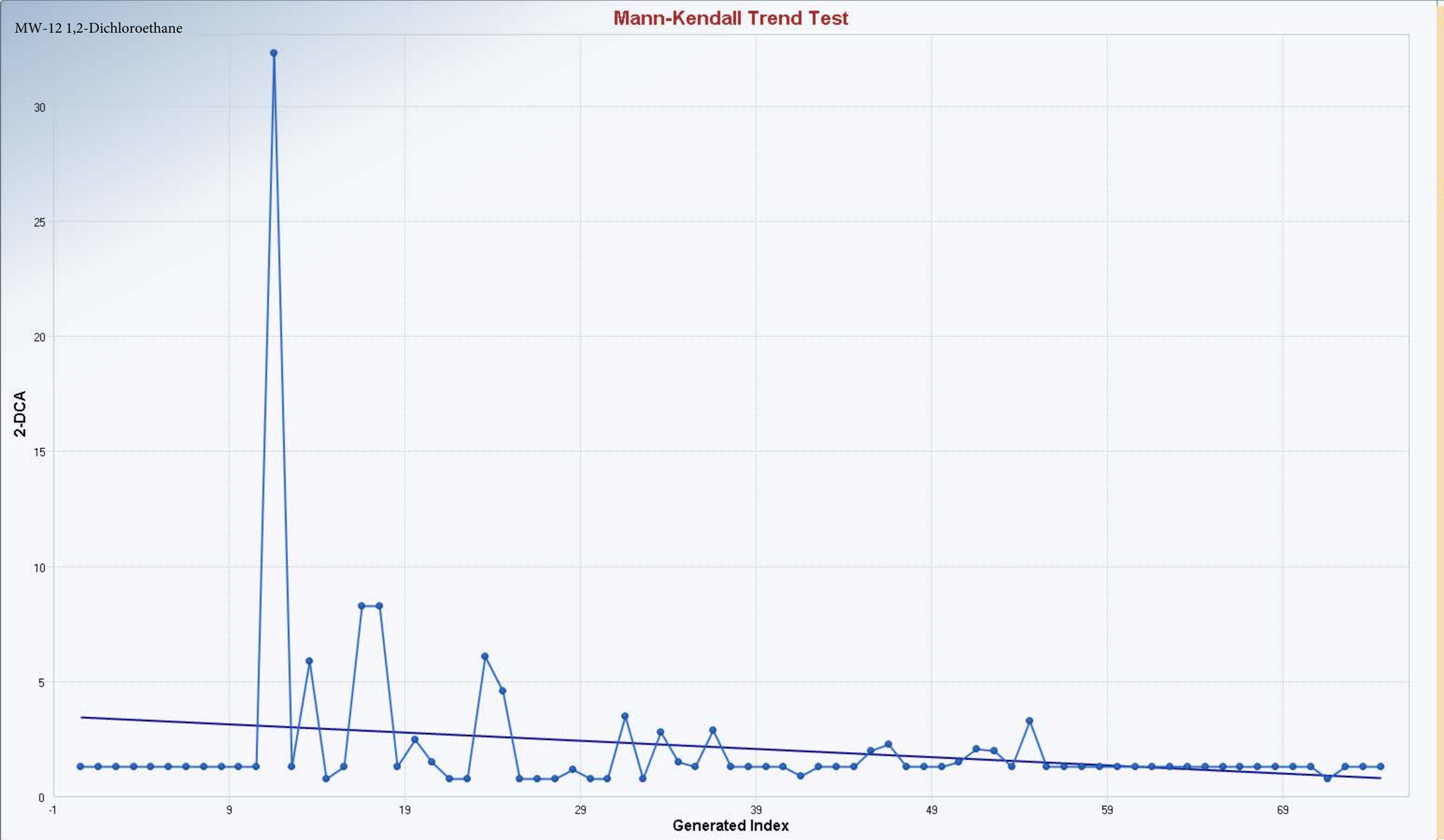
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	1
Maximum	194000
Mean	17103
Geometric Mean	1858
Median	2580
Standard Deviation	39100
Coefficient of Variation	2.286

Mann-Kendall Test

M-K Test Value (S)	-542
Critical Value (0.05)	-1.645
Standard Deviation of S	218.6
Standardized Value of S	-2.475
Approximate p-value	0.00666

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 1,2-Dichloroethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.9015
Standardized Value of S	-0.5391
M-K Test Value (S)	-105
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2949

OLS Regression Line (Blue)

OLS Regression Slope	-0.0356
OLS Regression Intercept	3.2126

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:49:46 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

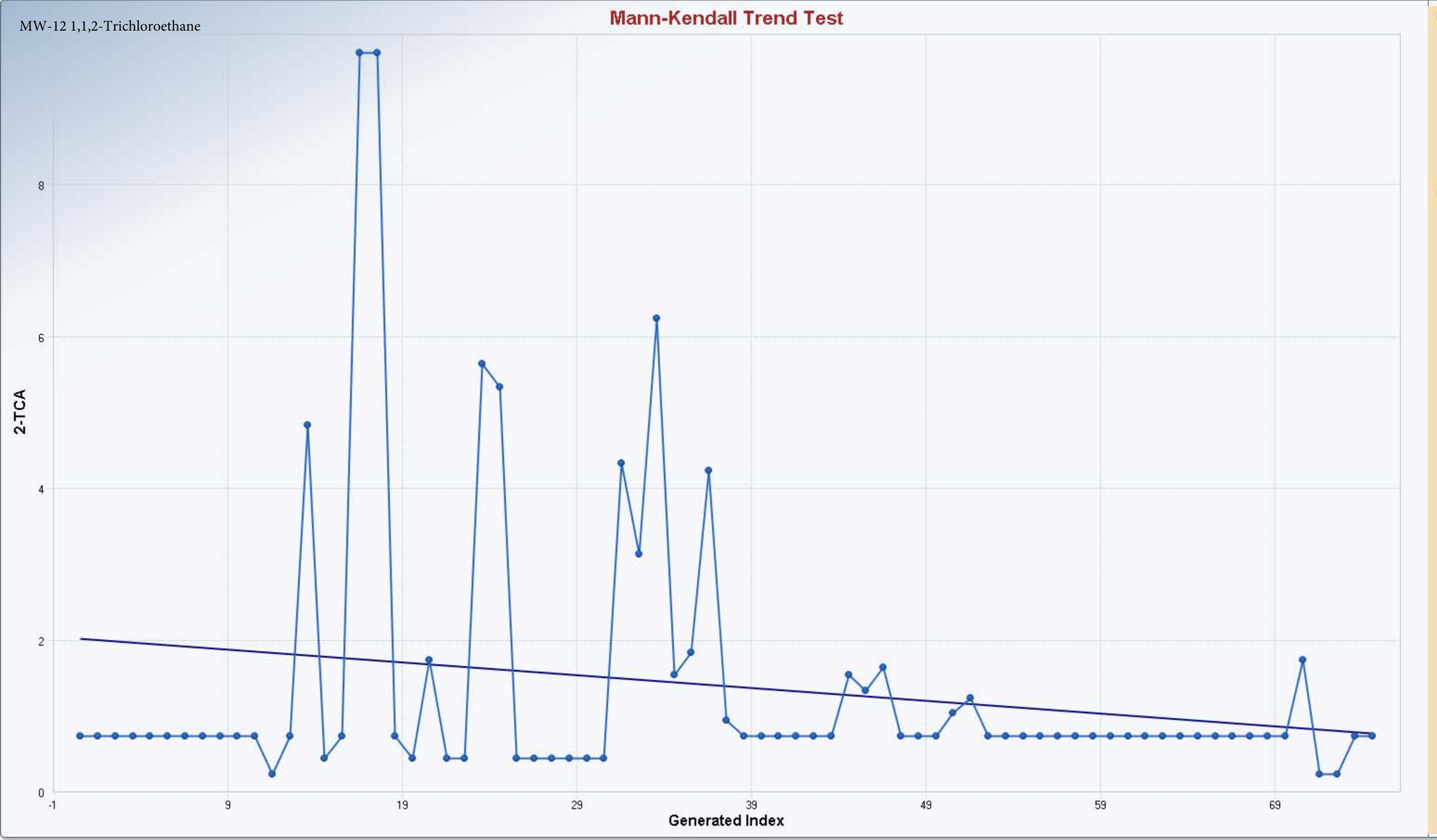
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	32
Mean	1.86
Geometric Mean	1.187
Median	1
Standard Deviation	3.819
Coefficient of Variation	2.053

Mann-Kendall Test

M-K Test Value (S)	-105
Critical Value (0.05)	-1.645
Standard Deviation of S	192.9
Standardized Value of S	-0.539
Approximate p-value	0.295

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 1,1,2-Trichloroethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	196.2898
Standardized Value of S	-0.5095
M-K Test Value (S)	-101
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3052

OLS Regression Line (Blue)

OLS Regression Slope	-0.0170
OLS Regression Intercept	2.3026

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:47:37 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

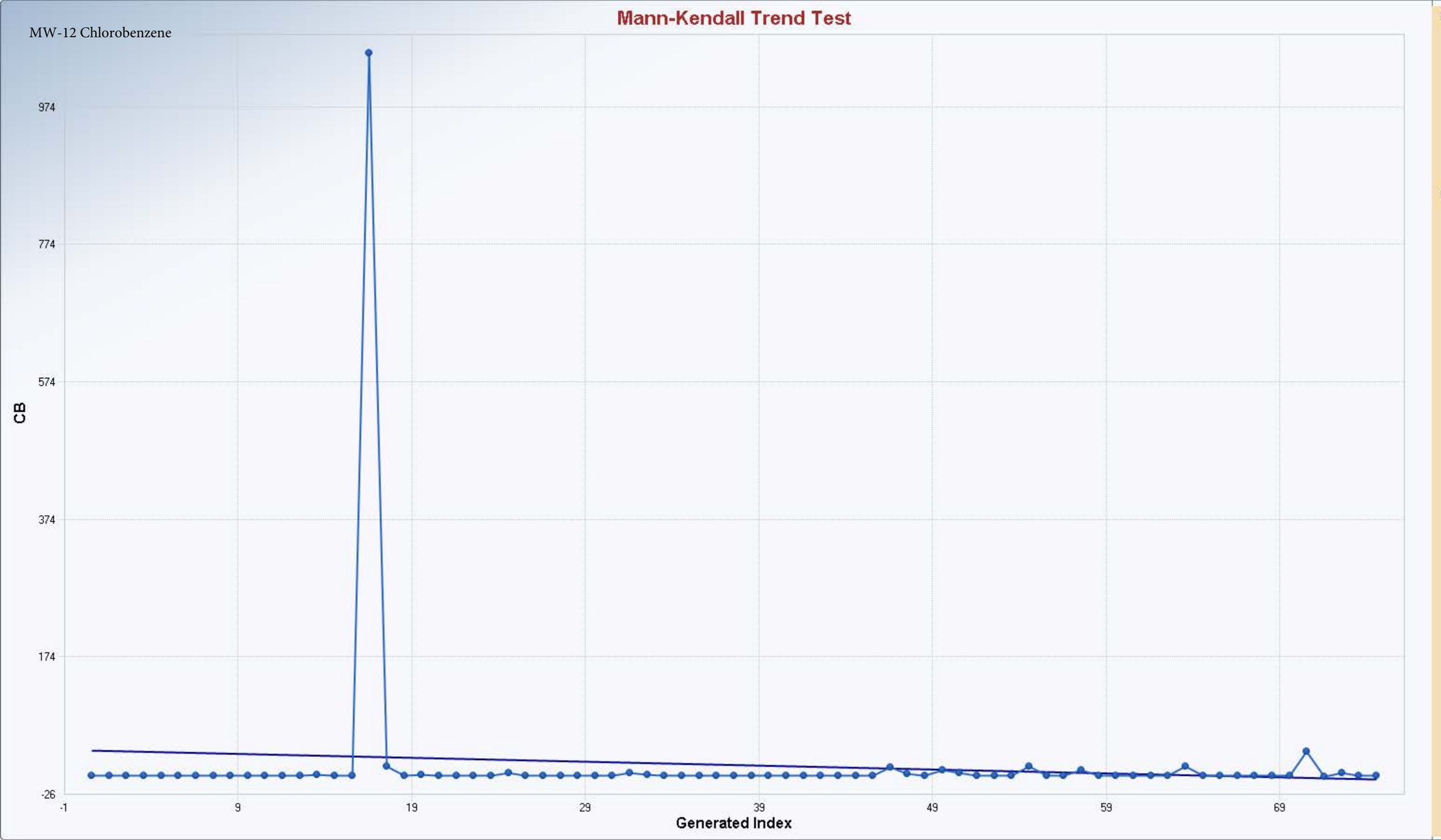
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	10
Mean	1.657
Geometric Mean	1.229
Median	1
Standard Deviation	1.876
Coefficient of Variation	1.132

Mann-Kendall Test

M-K Test Value (S)	-101
Critical Value (0.05)	-1.645
Standard Deviation of S	196.3
Standardized Value of S	-0.509
Approximate p-value	0.305

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 Chlorobenzene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	196.3831
Standardized Value of S	-0.3463
M-K Test Value (S)	-69
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3646

OLS Regression Line (Blue)

OLS Regression Slope	-0.5751
OLS Regression Intercept	38.7070

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:51:18 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	1052
Mean	16.85
Geometric Mean	1.729
Median	1
Standard Deviation	121.3
Coefficient of Variation	7.195

Mann-Kendall Test

M-K Test Value (S)	-69
Critical Value (0.05)	-1.645
Standard Deviation of S	196.4
Standardized Value of S	-0.346
Approximate p-value	0.365

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 Chloroform

Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	215.2982
Standardized Value of S	-1.6860
M-K Test Value (S)	-364
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0459

OLS Regression Line (Blue)

OLS Regression Slope	-3.6756
OLS Regression Intercept	198.9250

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Chloroform	**Mann-Kendall Trend Test Analysis**
User Selected Options	
Date/Time of Computation	ProUCL 5.16/3/2019 7:54:31 AM
From File	MW-12.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

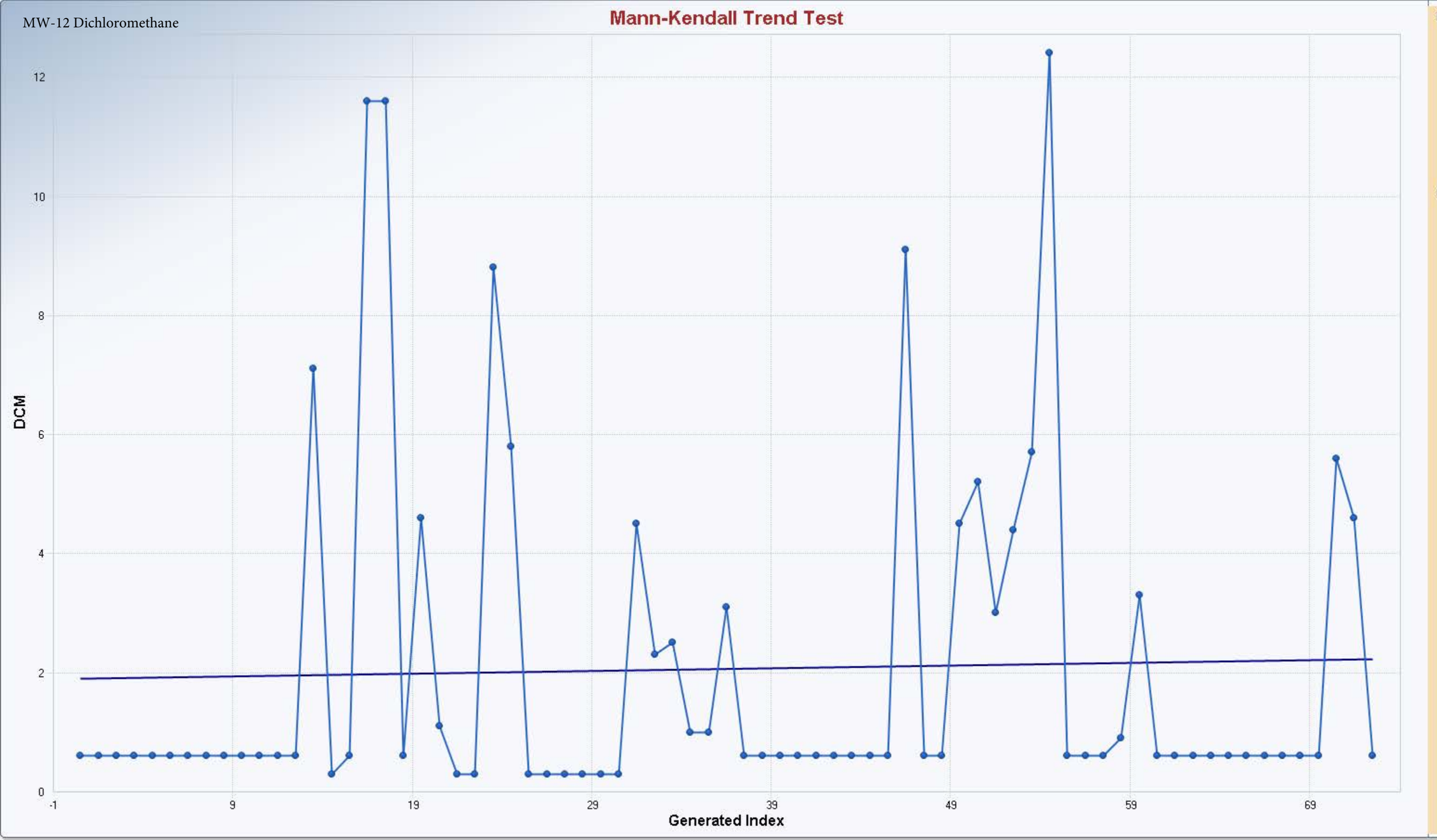
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	1600
Mean	59.25
Geometric Mean	5.496
Median	4.7
Standard Deviation	237.9
Coefficient of Variation	4.015

Mann-Kendall Test	
M-K Test Value (S)	-364
Critical Value (0.05)	-1.645
Standard Deviation of S	215.3
Standardized Value of S	-1.686
Approximate p-value	0.0459

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Dichloromethane



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	191.3879
Standardized Value of S	1.1652
M-K Test Value (S)	224
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1220

OLS Regression Line (Blue)

OLS Regression Slope	0.0046
OLS Regression Intercept	2.2906

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:55:39 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

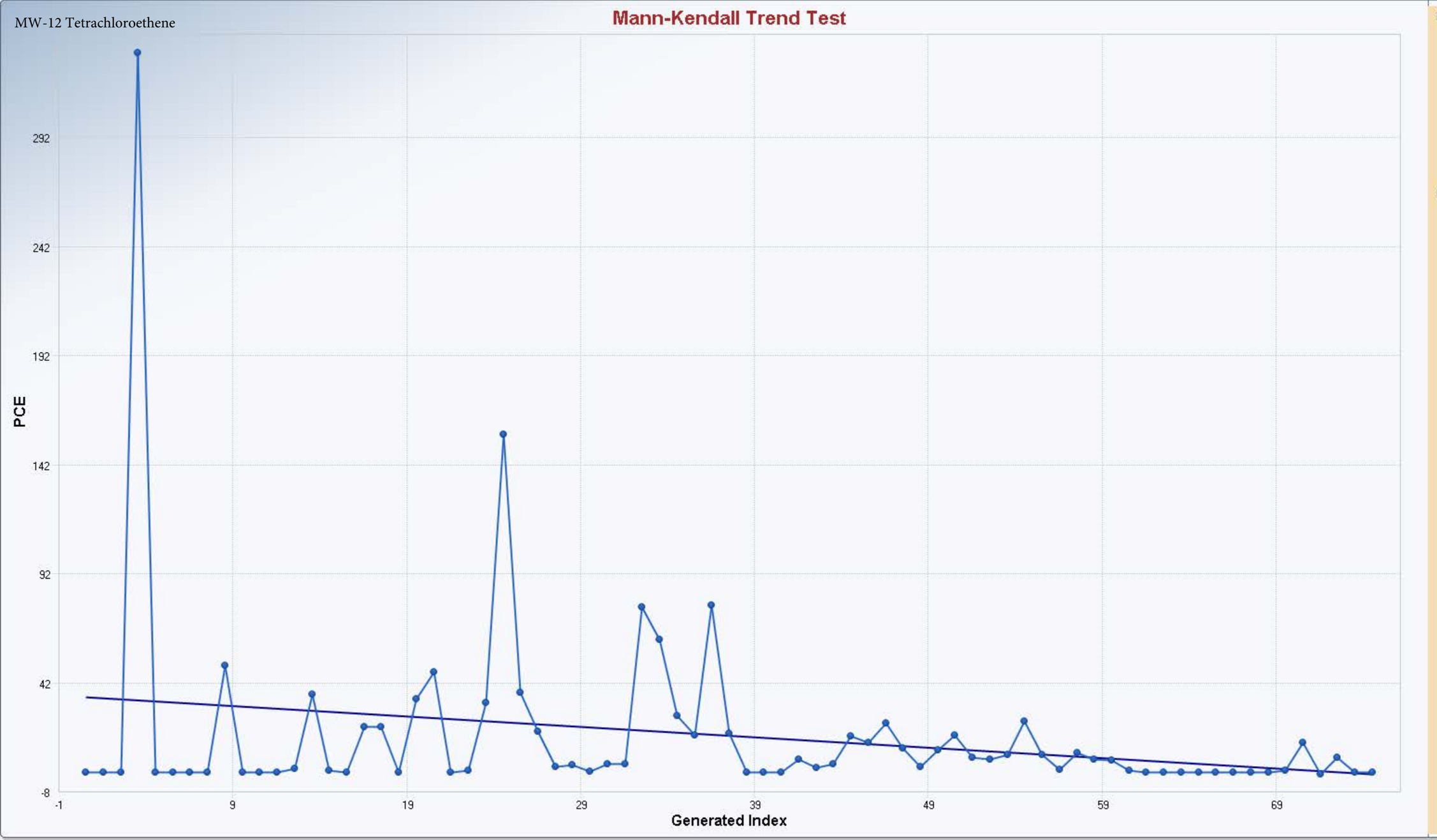
Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	75
Number Values Missing	2
Number Values Used	73
Minimum	0.7
Maximum	12.8
Mean	2.46
Geometric Mean	1.574
Median	1
Standard Deviation	2.912
Coefficient of Variation	1.184

Mann-Kendall Test

M-K Test Value (S)	224
Critical Value (0.05)	1.645
Standard Deviation of S	191.4
Standardized Value of S	1.165
Approximate p-value	0.122

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 Tetrachloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	215.2951
Standardized Value of S	-1.0637
M-K Test Value (S)	-230
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1437

OLS Regression Line (Blue)

OLS Regression Slope	-0.4789
OLS Regression Intercept	36.2683

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:56:50 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

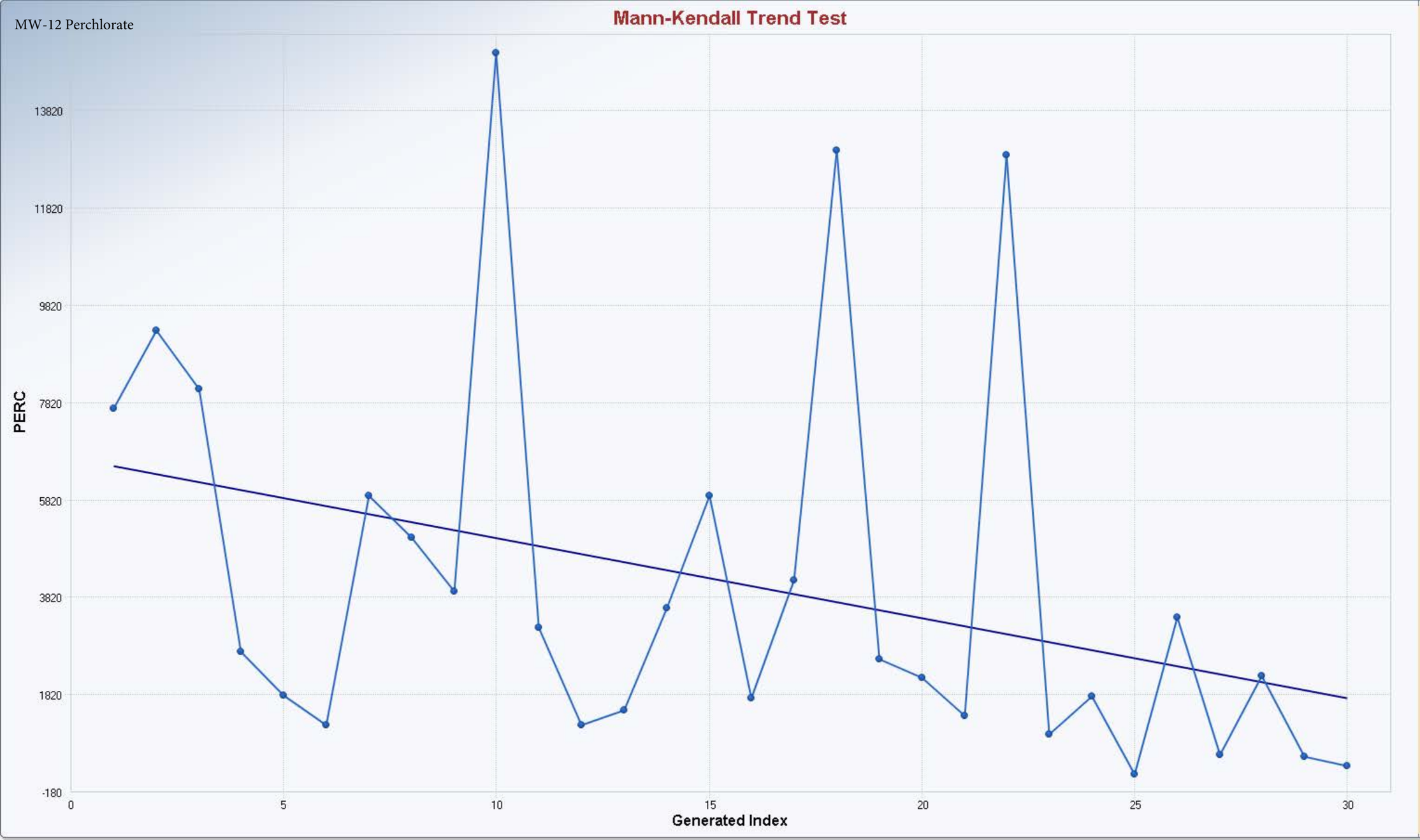
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	331
Mean	18.07
Geometric Mean	4.999
Median	4.6
Standard Deviation	43.68
Coefficient of Variation	2.418

Mann-Kendall Test

M-K Test Value (S)	-230
Critical Value (0.05)	-1.645
Standard Deviation of S	215.3
Standardized Value of S	-1.064
Approximate p-value	0.144

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-12 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-2.9982
M-K Test Value (S)	-169
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0014

OLS Regression Line (Blue)

OLS Regression Slope	-164.5873
OLS Regression Intercept	6,687.1034

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:41:38 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

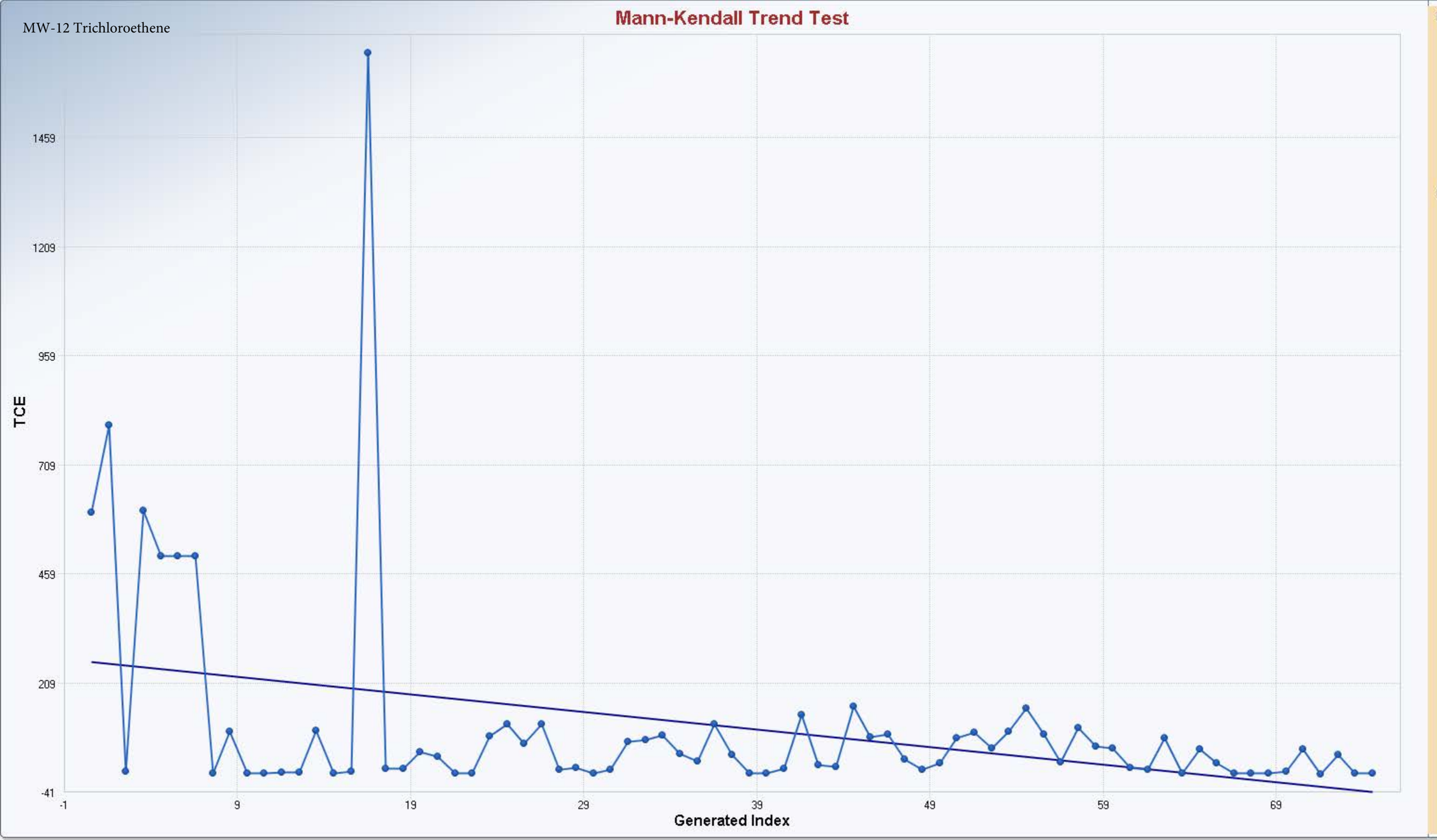
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	75
Number Values Missing	45
Number Values Used	30
Minimum	190
Maximum	15000
Mean	4136
Geometric Mean	2569
Median	2625
Standard Deviation	3996
Coefficient of Variation	0.966

Mann-Kendall Test

M-K Test Value (S)	-169
Critical Value (0.05)	-1.645
Standard Deviation of S	56.03
Standardized Value of S	-2.998
Approximate p-value	0.00136

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Trichloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	218.3140
Standardized Value of S	-1.8964
M-K Test Value (S)	-415
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0290

OLS Regression Line (Blue)

OLS Regression Slope	-4.0308
OLS Regression Intercept	261.4485

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 7:59:10 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

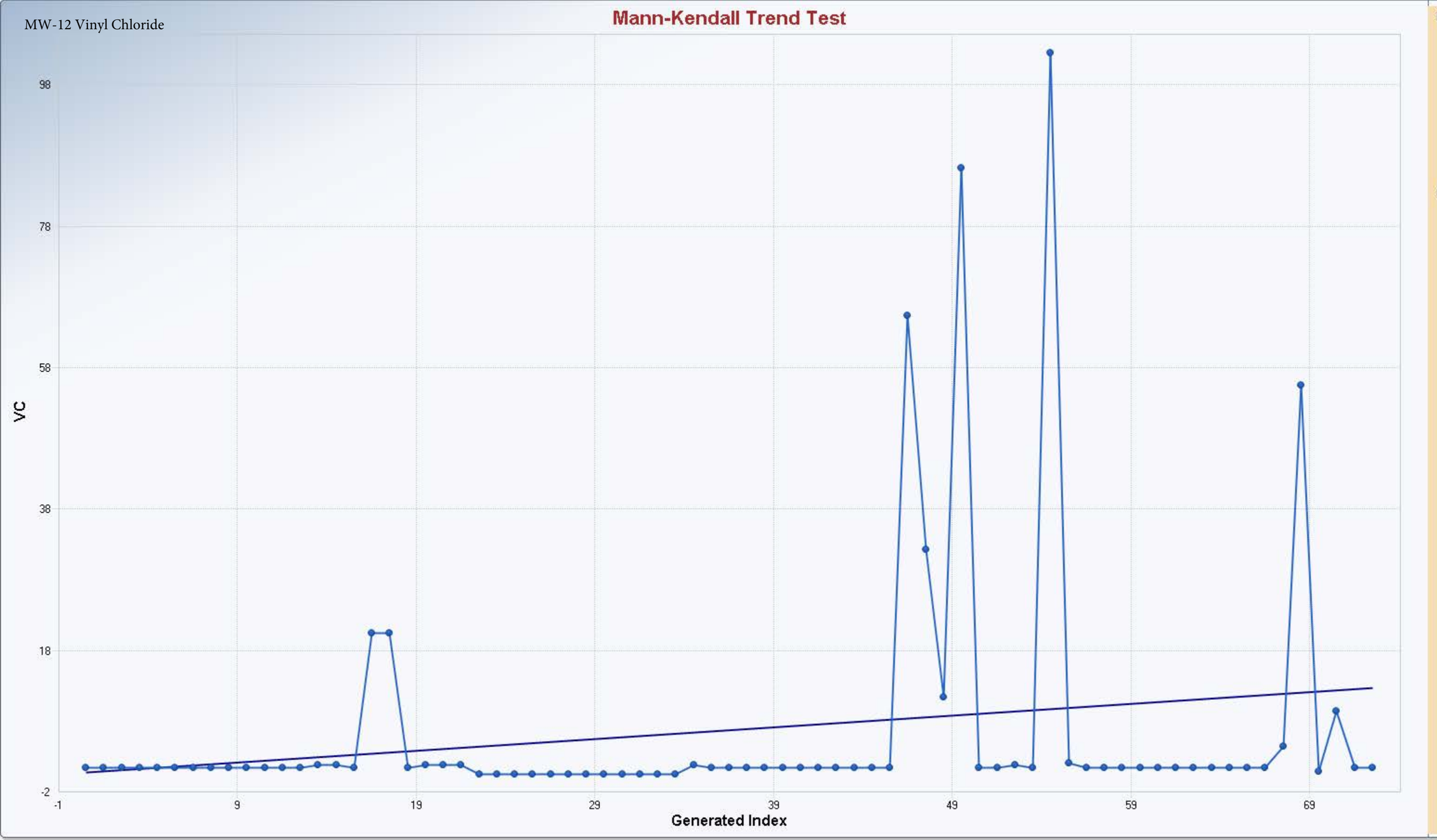
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	1652
Mean	108.3
Geometric Mean	23.17
Median	41
Standard Deviation	238.8
Coefficient of Variation	2.206

Mann-Kendall Test

M-K Test Value (S)	-415
Critical Value (0.05)	-1.645
Standard Deviation of S	218.3
Standardized Value of S	-1.896
Approximate p-value	0.029

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-12 Vinyl Chloride



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	187.9353
Standardized Value of S	1.5112
M-K Test Value (S)	285
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0654

OLS Regression Line (Blue)

OLS Regression Slope	0.1673
OLS Regression Intercept	0.0889

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-12 Vinyl Chloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:07:57 AM	
From File	MW-12.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

VC

General Statistics

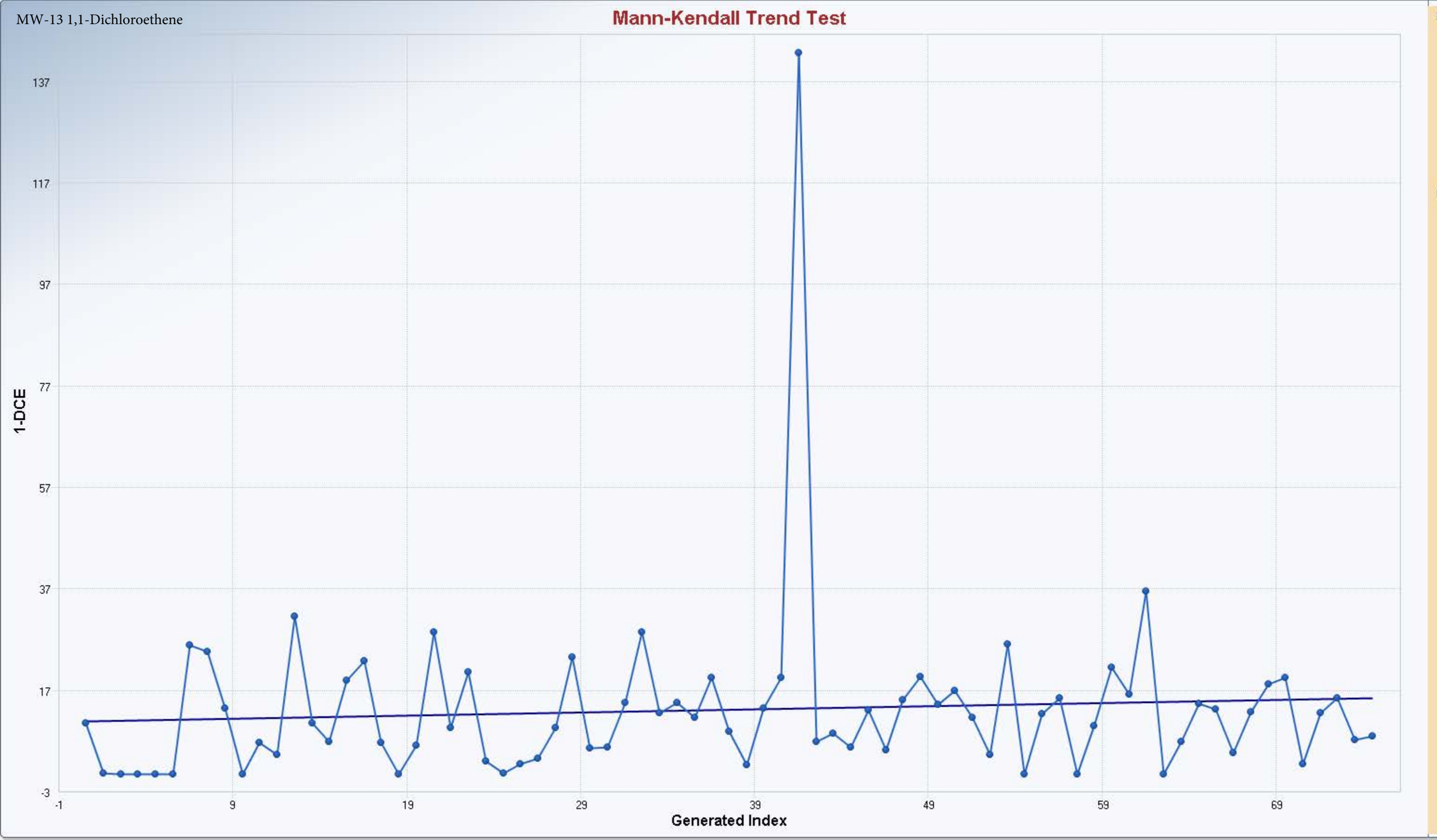
Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	75
Number Values Missing	2
Number Values Used	73
Minimum	0.1
Maximum	102
Mean	6.281
Geometric Mean	1.103
Median	1
Standard Deviation	18.34
Coefficient of Variation	2.919

Mann-Kendall Test

M-K Test Value (S)	285
Critical Value (0.05)	1.645
Standard Deviation of S	187.9
Standardized Value of S	1.511
Approximate p-value	0.0654

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-13 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	218.3667
Standardized Value of S	1.5158
M-K Test Value (S)	332
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0648

OLS Regression Line (Blue)

OLS Regression Slope	0.0615
OLS Regression Intercept	11.3201

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-13 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:19:51 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

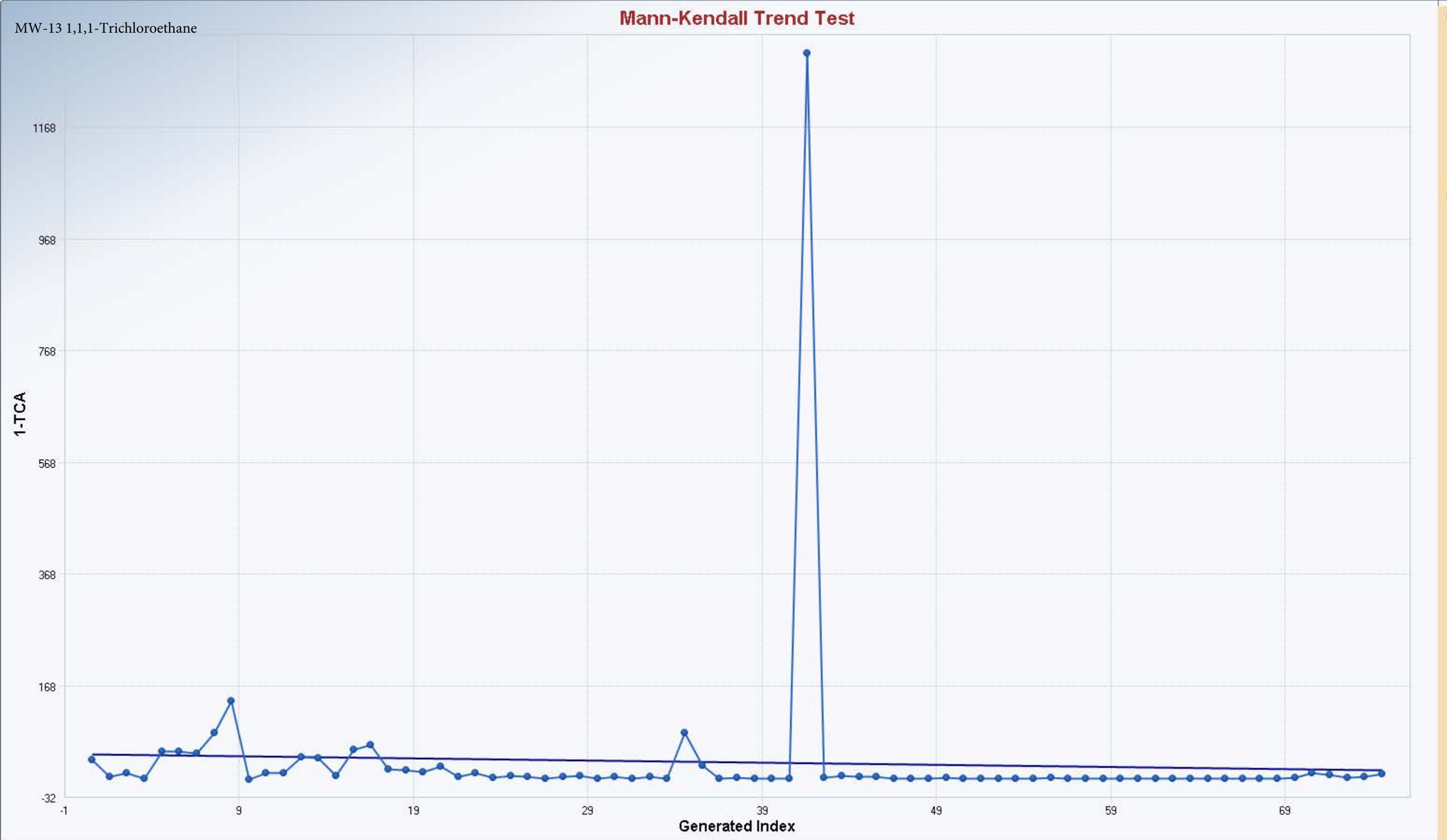
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	1
Maximum	143
Mean	13.66
Geometric Mean	8.385
Median	11
Standard Deviation	17.36
Coefficient of Variation	1.271

Mann-Kendall Test

M-K Test Value (S)	332
Critical Value (0.05)	1.645
Standard Deviation of S	218.4
Standardized Value of S	1.516
Approximate p-value	0.0648

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-13 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	215.6780
Standardized Value of S	-5.3969
M-K Test Value (S)	-1,165
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3786
OLS Regression Intercept	44.8993

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:18:27 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.77
Maximum	1300
Mean	30.51
Geometric Mean	4.821
Median	4
Standard Deviation	150.5
Coefficient of Variation	4.931

Mann-Kendall Test

M-K Test Value (S)	-1165
Critical Value (0.05)	-1.645
Standard Deviation of S	215.7
Standardized Value of S	-5.397
Approximate p-value	3.3895E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 1,2-Dichloroethane

Mann-Kendall Trend Test

Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	191.9514
Standardized Value of S	1.4639
M-K Test Value (S)	282
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0716

OLS Regression Line (Blue)

OLS Regression Slope	-0.0323
OLS Regression Intercept	3.1109

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-13 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:20:43 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

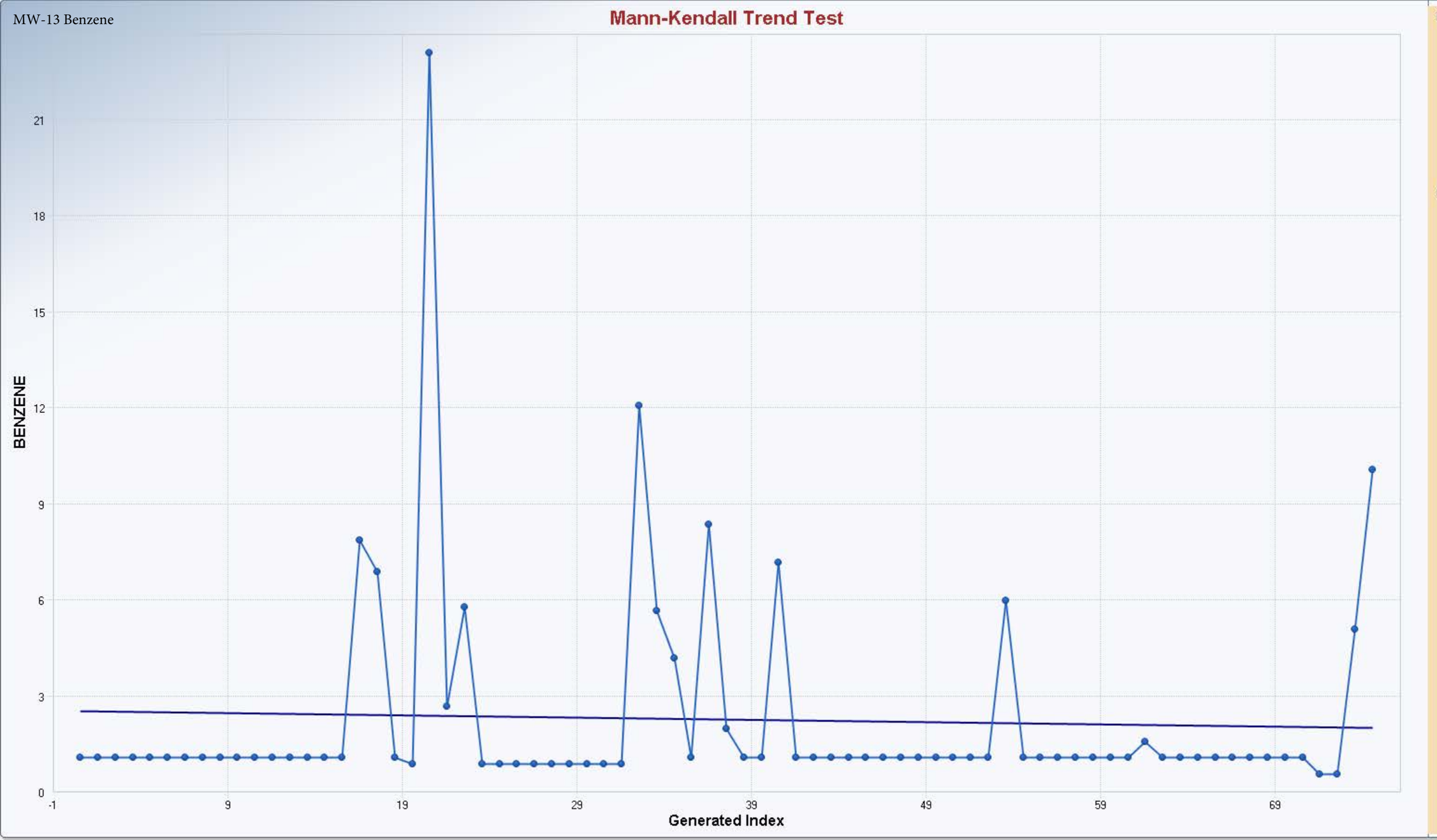
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.4
Maximum	30
Mean	1.883
Geometric Mean	1.028
Median	1
Standard Deviation	4.207
Coefficient of Variation	2.235

Mann-Kendall Test

M-K Test Value (S)	282
Critical Value (0.05)	1.645
Standard Deviation of S	192
Standardized Value of S	1.464
Approximate p-value	0.0716

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-13 Benzene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	187.1016
Standardized Value of S	0.1603
M-K Test Value (S)	31
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4363

OLS Regression Line (Blue)

OLS Regression Slope	-0.0070
OLS Regression Intercept	2.4567

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-13 Benzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:22:44 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

BENZENE

General Statistics

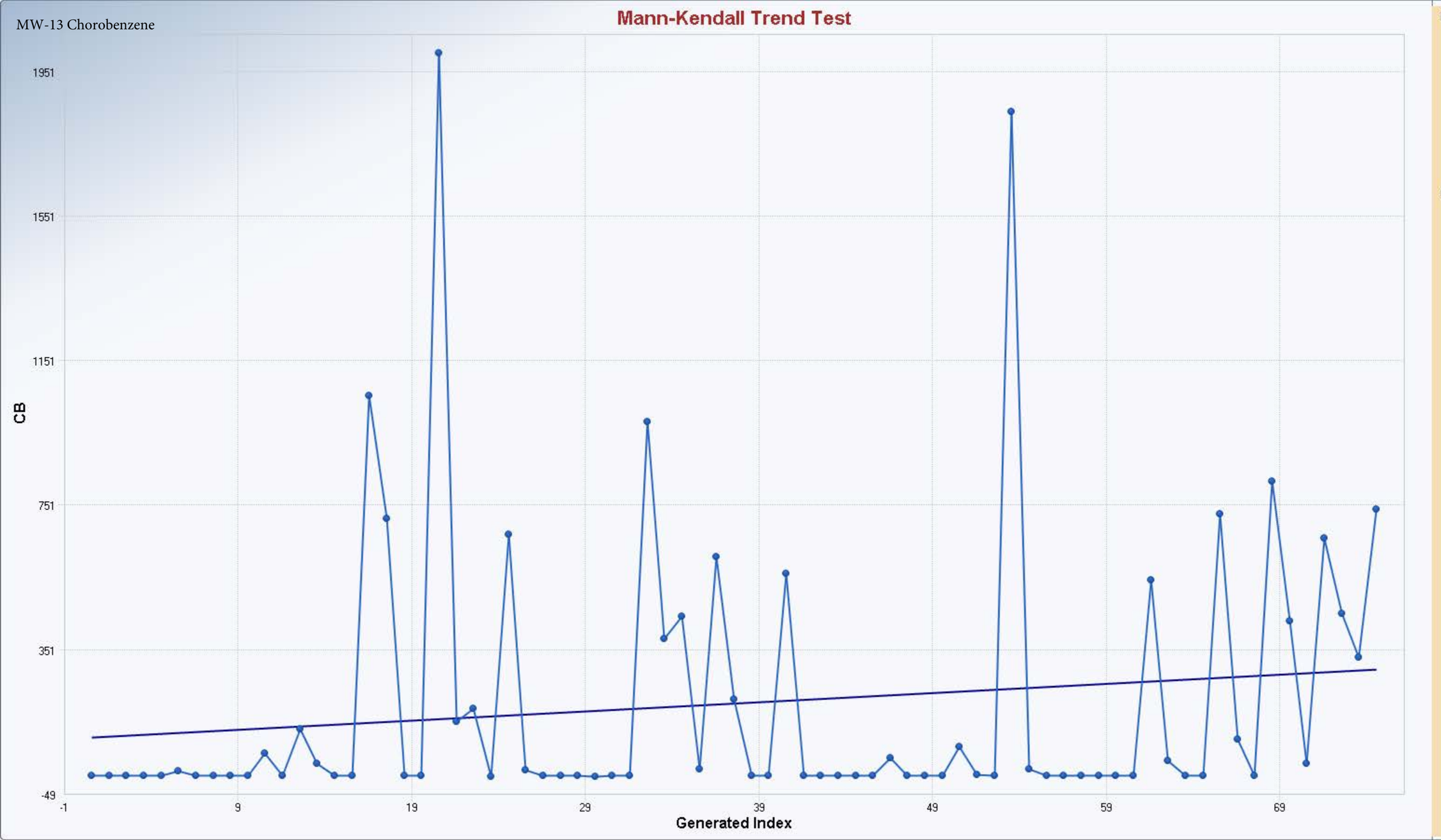
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.5
Maximum	23
Mean	2.191
Geometric Mean	1.352
Median	1
Standard Deviation	3.384
Coefficient of Variation	1.545

Mann-Kendall Test

M-K Test Value (S)	31
Critical Value (0.05)	1.645
Standard Deviation of S	187.1
Standardized Value of S	0.16
Approximate p-value	0.436

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-13 Chorobenzene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	211.9442
Standardized Value of S	1.7269
M-K Test Value (S)	367
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0421

OLS Regression Line (Blue)

OLS Regression Slope	2.5209
OLS Regression Intercept	106.3344

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-13 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:23:51 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

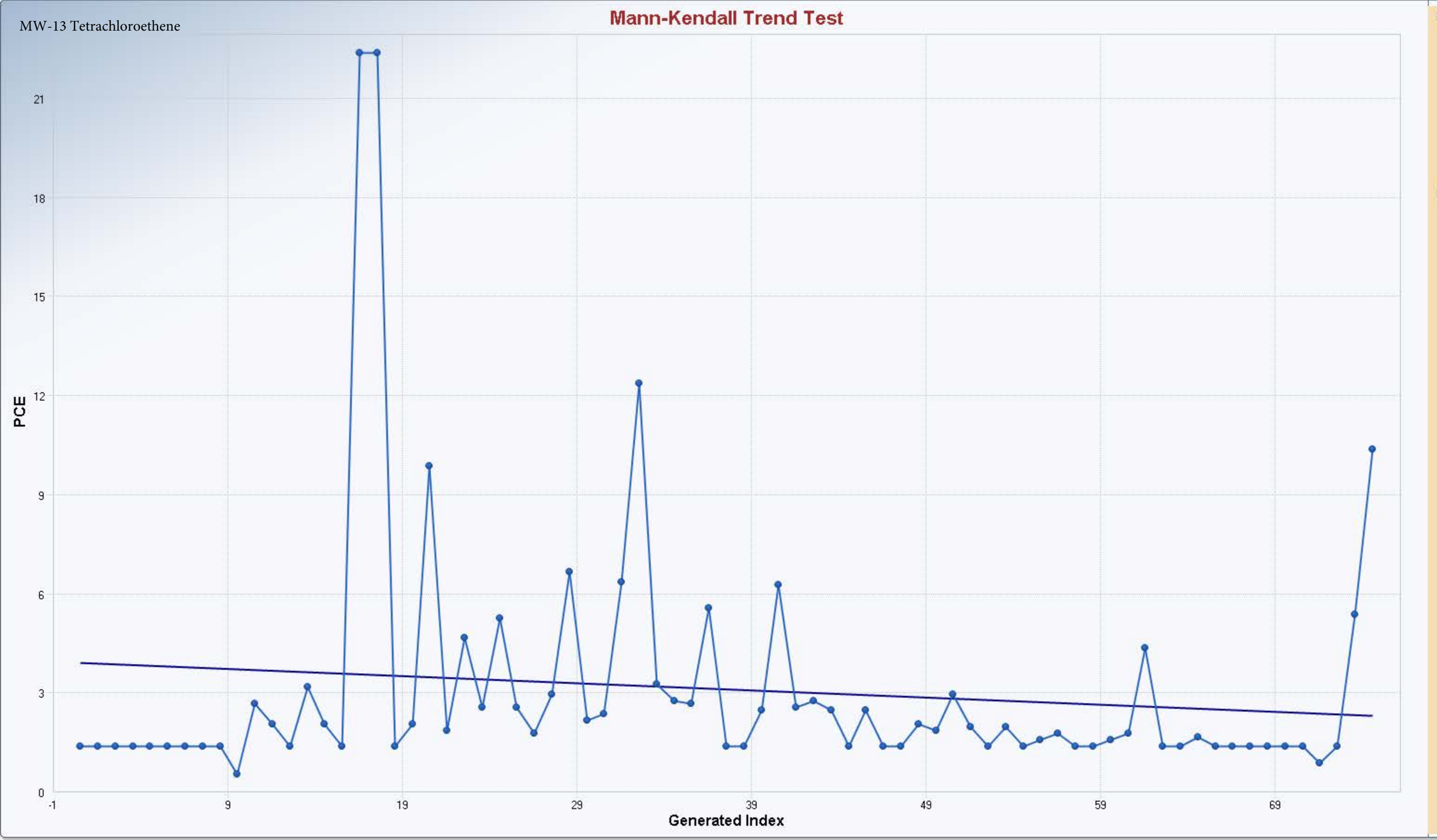
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.7
Maximum	2000
Mean	202.1
Geometric Mean	11.57
Median	1.5
Standard Deviation	393.9
Coefficient of Variation	1.949

Mann-Kendall Test

M-K Test Value (S)	367
Critical Value (0.05)	1.645
Standard Deviation of S	211.9
Standardized Value of S	1.727
Approximate p-value	0.0421

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-13 Tetrachloroethene



Mann-Kendall Trend Analysis

n	75
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	211.2424
Standardized Value of S	-1.1125
M-K Test Value (S)	-236
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1330

OLS Regression Line (Blue)

OLS Regression Slope	-0.0219
OLS Regression Intercept	3.5756

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-13 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:25:20 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

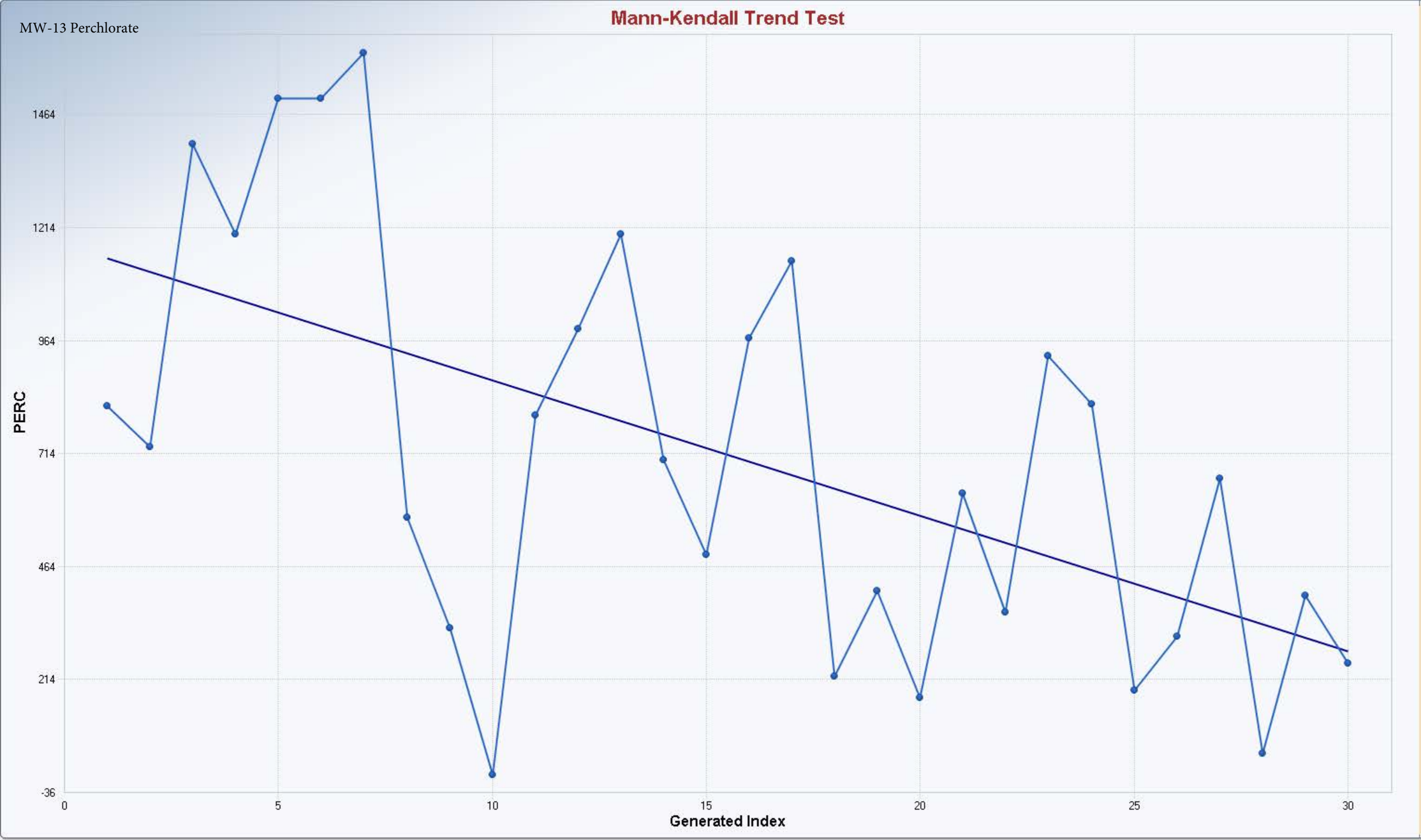
Number or Reported Events Not Used	0
Number of Generated Events	75
Number Values Reported (n)	75
Minimum	0.18
Maximum	22
Mean	2.742
Geometric Mean	1.767
Median	1.4
Standard Deviation	3.87
Coefficient of Variation	1.411

Mann-Kendall Test

M-K Test Value (S)	-236
Critical Value (0.05)	-1.645
Standard Deviation of S	211.2
Standardized Value of S	-1.112
Approximate p-value	0.133

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-13 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-3.0339
M-K Test Value (S)	-171
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0012

OLS Regression Line (Blue)

OLS Regression Slope	-29.9832
OLS Regression Intercept	1,176.5823

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:17:28 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

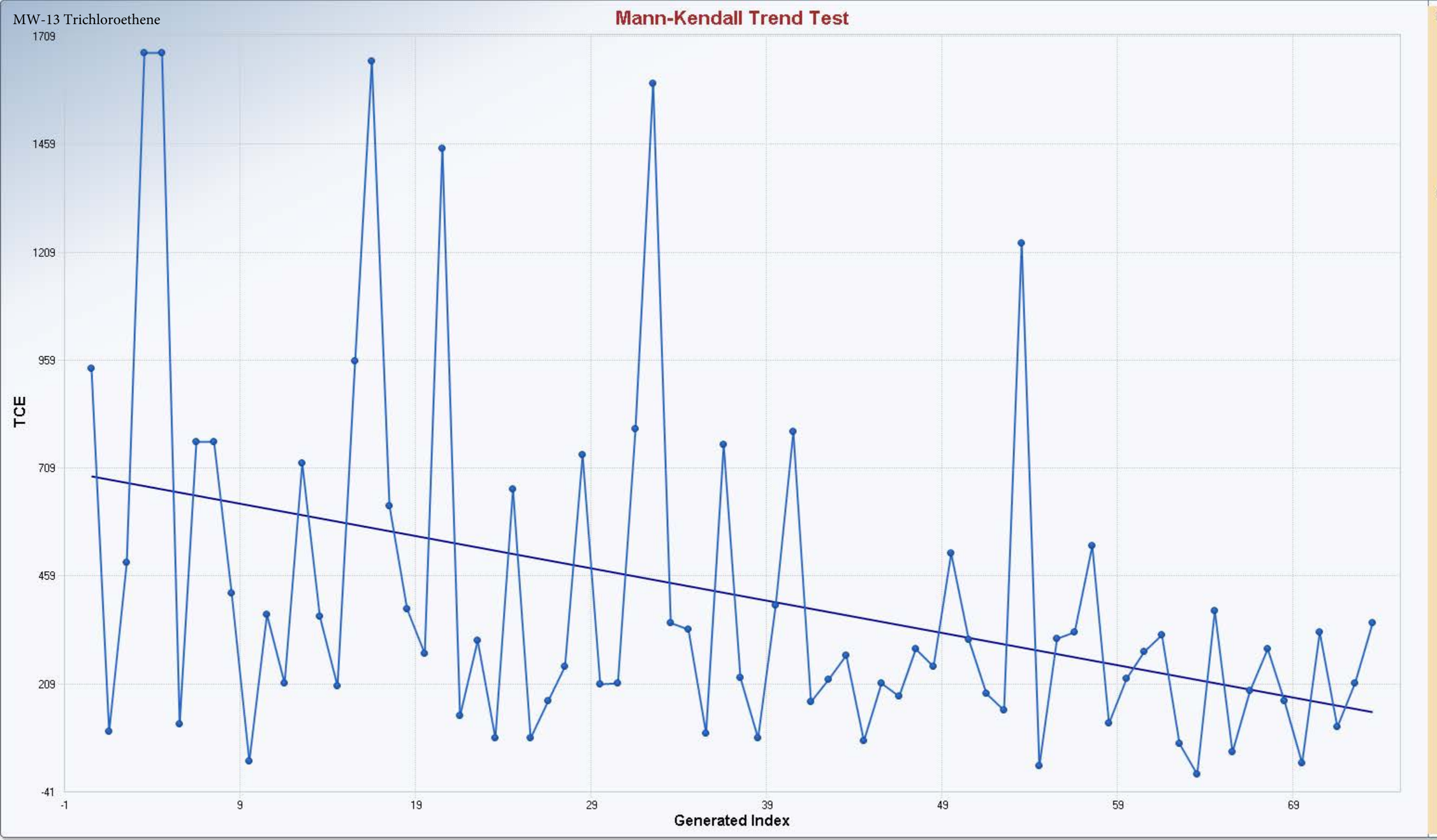
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	75
Number Values Missing	45
Number Values Used	30
Minimum	4.3
Maximum	1600
Mean	711.8
Geometric Mean	491.8
Median	680
Standard Deviation	456.3
Coefficient of Variation	0.641

Mann-Kendall Test

M-K Test Value (S)	-171
Critical Value (0.05)	-1.645
Standard Deviation of S	56.03
Standardized Value of S	-3.034
Approximate p-value	0.00121

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 Trichloroethene



Mann-Kendall Trend Analysis

n	74
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	214.2530
Standardized Value of S	-2.9965
M-K Test Value (S)	-643
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0014

OLS Regression Line (Blue)

OLS Regression Slope	-7.4614
OLS Regression Intercept	696.7655

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:26:47 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

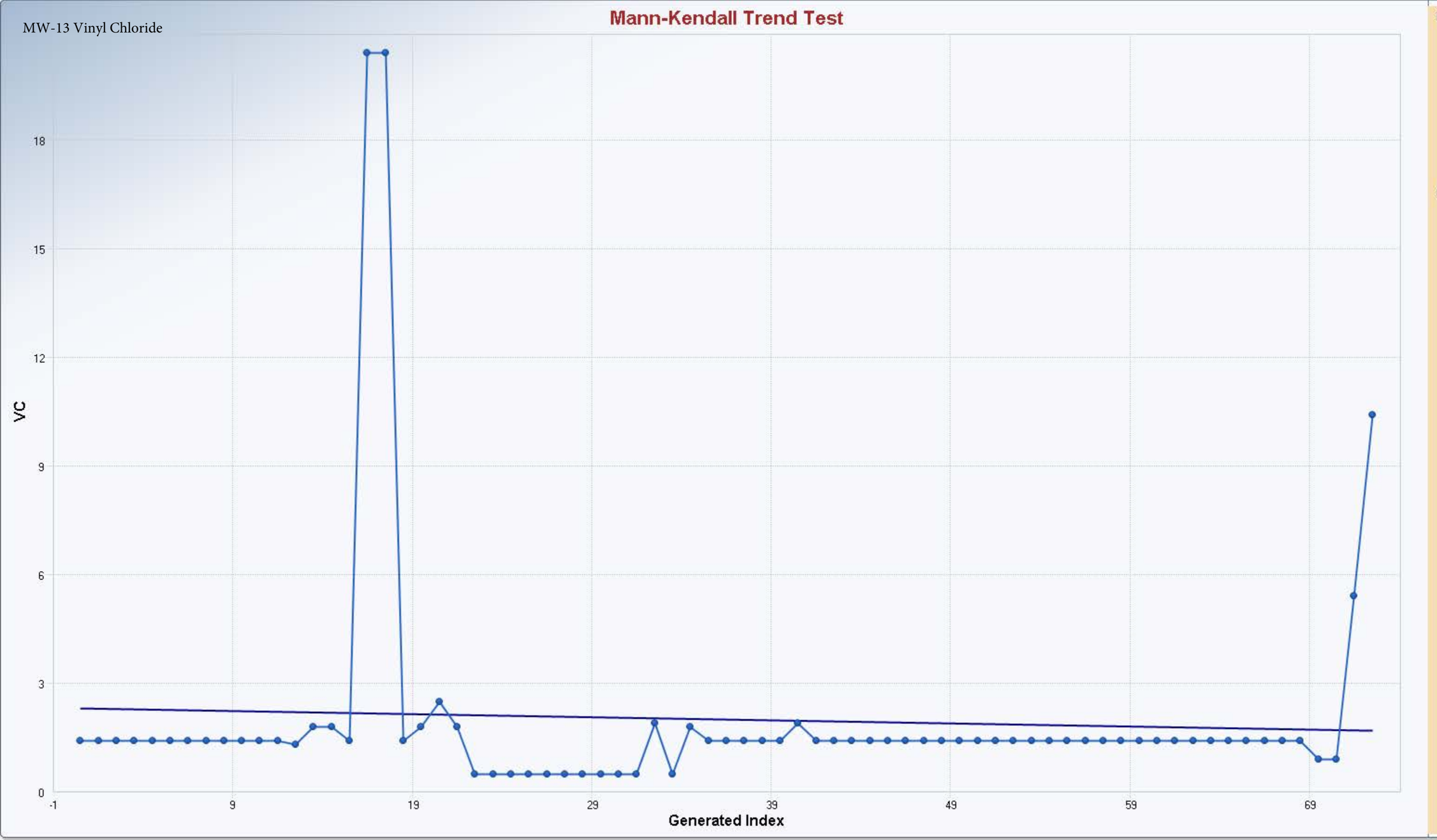
Number or Reported Events Not Used	0
Number of Generated Events	74
Number Values Reported (n)	75
Number Values Missing	1
Number Values Used	74
Minimum	0.96
Maximum	1670
Mean	417
Geometric Mean	258.3
Median	287
Standard Deviation	409.6
Coefficient of Variation	0.982

Mann-Kendall Test

M-K Test Value (S)	-643
Critical Value (0.05)	-1.645
Standard Deviation of S	214.3
Standardized Value of S	-2.996
Approximate p-value	0.00137

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-13 Vinyl Chloride



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	178.9311
Standardized Value of S	0.1788
M-K Test Value (S)	33
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4290

OLS Regression Line (Blue)

OLS Regression Slope	-0.0083
OLS Regression Intercept	1.9113

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-13 Vinyl Chloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:27:40 AM	
From File	MW-13_ucl.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

VC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	75
Number Values Missing	2
Number Values Used	73
Minimum	0.1
Maximum	20
Mean	1.604
Geometric Mean	0.829
Median	1
Standard Deviation	3.342
Coefficient of Variation	2.084

Mann-Kendall Test

M-K Test Value (S)	33
Critical Value (0.05)	1.645
Standard Deviation of S	178.9
Standardized Value of S	0.179
Approximate p-value	0.429

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-19 1,1-Dichloroethene

Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.3976
Standardized Value of S	-6.1173
M-K Test Value (S)	-1,233
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-8.3646
OLS Regression Intercept	450.1775

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:41:18 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	1
Maximum	2300
Mean	149.1
Geometric Mean	39.64
Median	34
Standard Deviation	361.8
Coefficient of Variation	2.428

Mann-Kendall Test

M-K Test Value (S)	-1233
Critical Value (0.05)	-1.645
Standard Deviation of S	201.4
Standardized Value of S	-6.117
Approximate p-value	4.760E-10

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 1,1,1-Trichloroethane

Mann-Kendall Trend Test

Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	197.2367
Standardized Value of S	-10.0995
M-K Test Value (S)	-1,993
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-79.2222
OLS Regression Intercept	3,993.2254

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:31:42 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

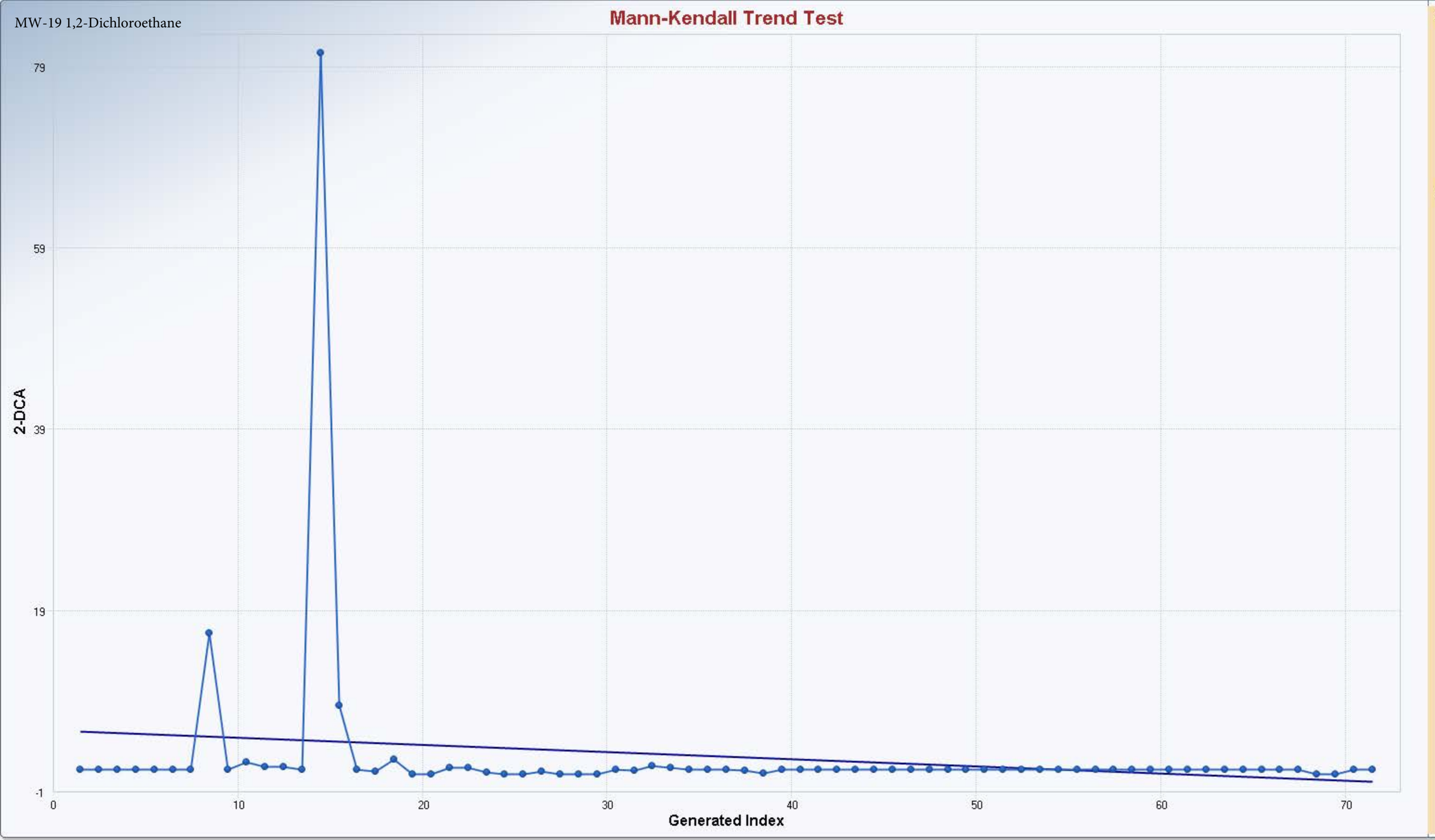
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	2
Maximum	16100
Mean	1181
Geometric Mean	119.3
Median	149
Standard Deviation	2740
Coefficient of Variation	2.32

Mann-Kendall Test

M-K Test Value (S)	-1993
Critical Value (0.05)	-1.645
Standard Deviation of S	197.2
Standardized Value of S	-10.1
Approximate p-value	2.775E-24

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 1,2-Dichloroethane



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	173.3196
Standardized Value of S	-1.1309
M-K Test Value (S)	-197
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1291

OLS Regression Line (Blue)

OLS Regression Slope	-0.0789
OLS Regression Intercept	5.2290

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-19 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:43:26 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.5
Maximum	80
Mean	2.39
Geometric Mean	1.061
Median	1
Standard Deviation	9.549
Coefficient of Variation	3.995

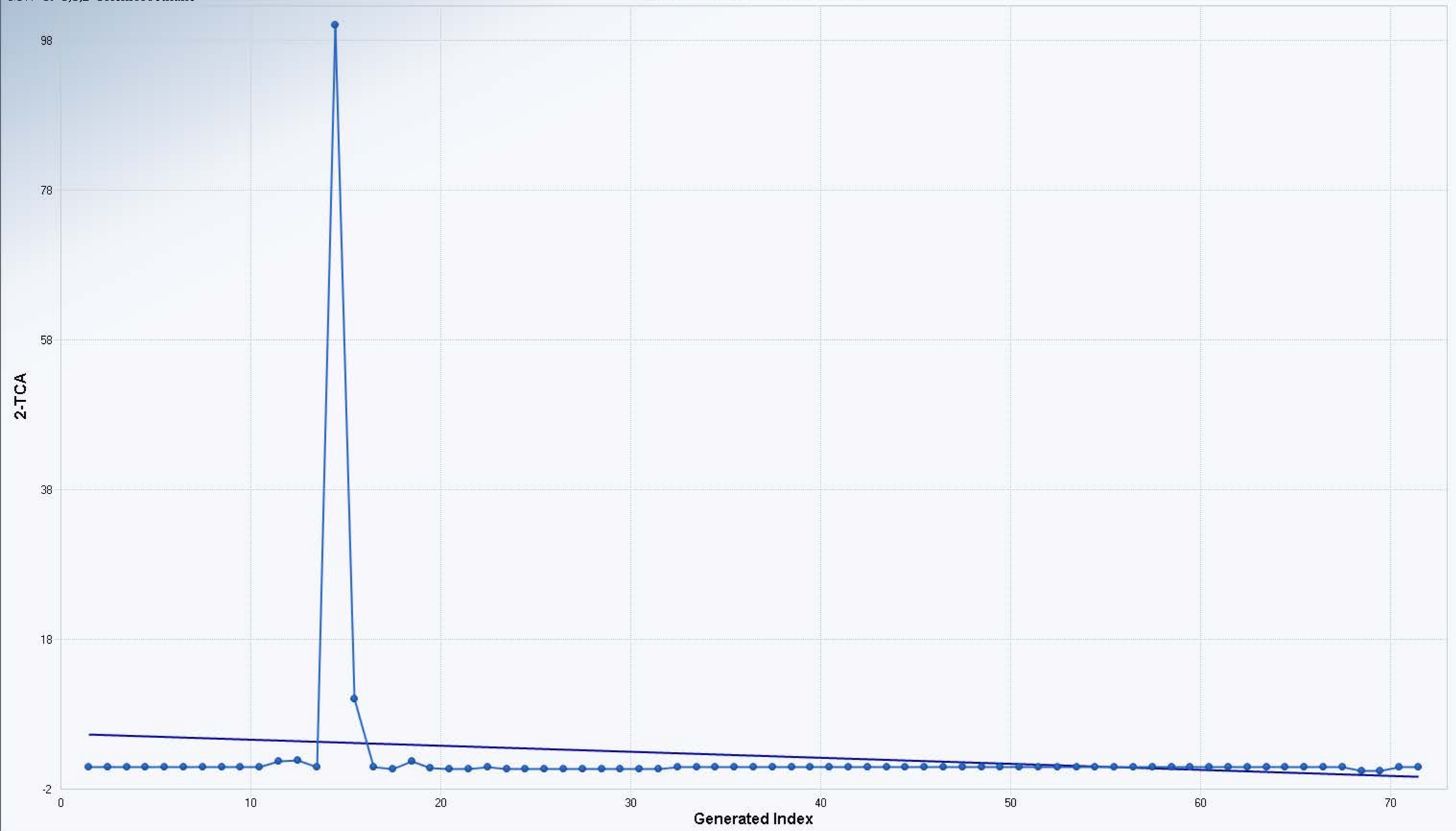
Mann-Kendall Test

M-K Test Value (S)	-197
Critical Value (0.05)	-1.645
Standard Deviation of S	173.3
Standardized Value of S	-1.131
Approximate p-value	0.129

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-19 1,1,2-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	164.0549
Standardized Value of S	0.2012
M-K Test Value (S)	34
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4203

OLS Regression Line (Blue)

OLS Regression Slope	-0.0806
OLS Regression Intercept	5.3843

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-19 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:39:10 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

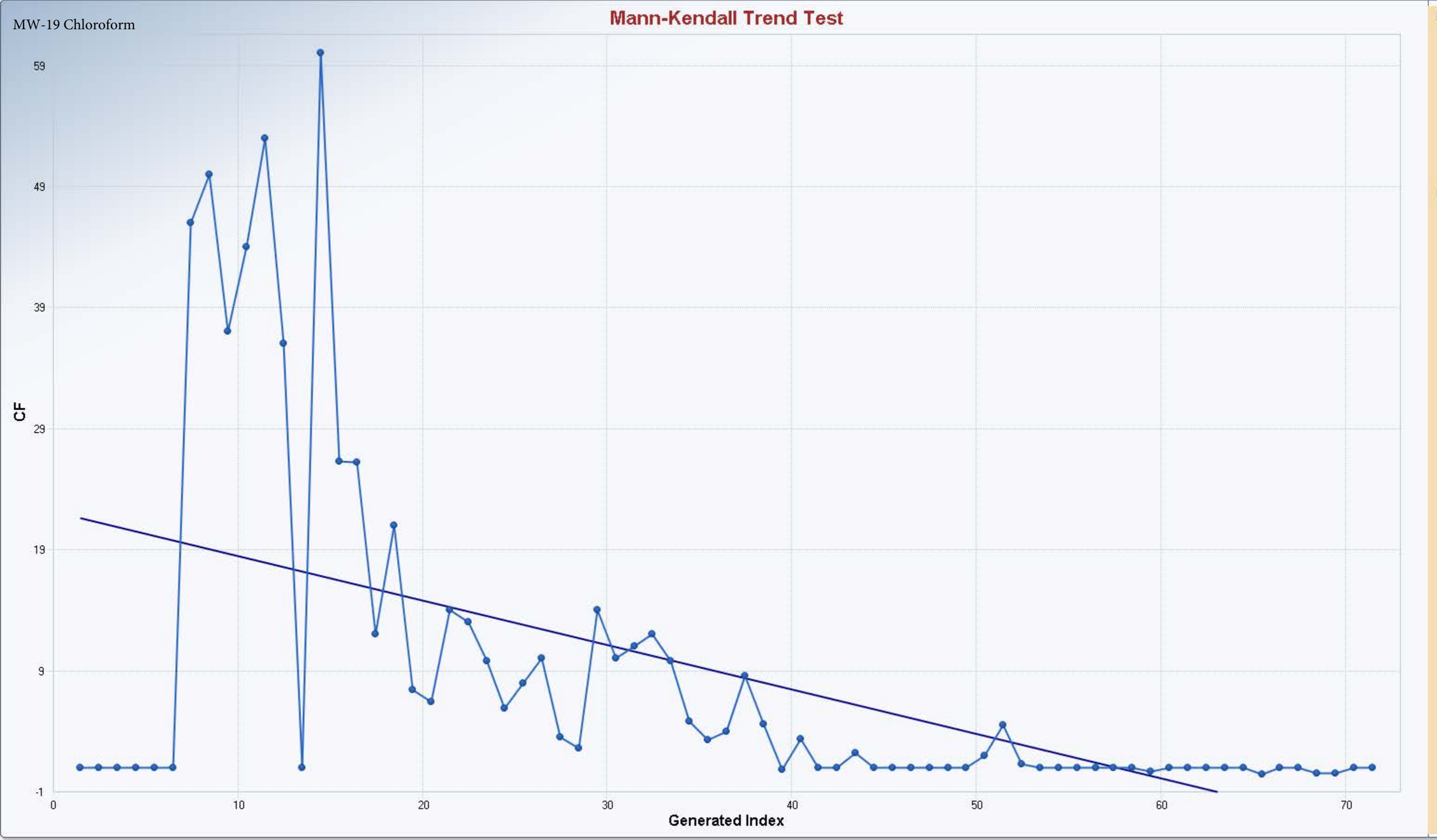
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.5
Maximum	100
Mean	2.482
Geometric Mean	1.035
Median	1
Standard Deviation	11.79
Coefficient of Variation	4.751

Mann-Kendall Test

M-K Test Value (S)	34
Critical Value (0.05)	1.645
Standard Deviation of S	164.1
Standardized Value of S	0.201
Approximate p-value	0.42

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-19 Chloroform



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	193.4985
Standardized Value of S	-6.2429
M-K Test Value (S)	-1,209
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3679
OLS Regression Intercept	21.9833

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:44:17 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

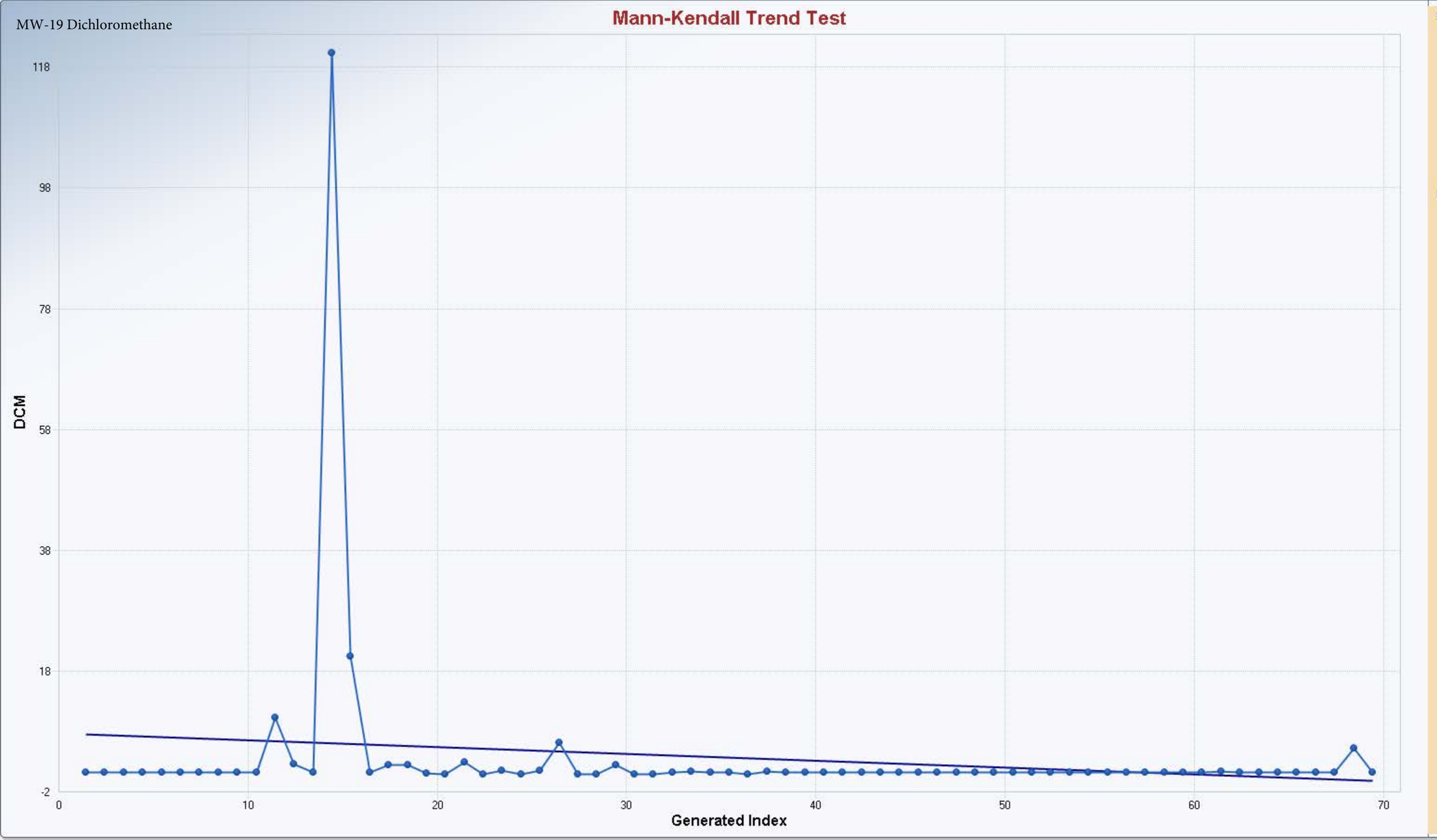
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.48
Maximum	60
Mean	8.74
Geometric Mean	3.096
Median	1.3
Standard Deviation	14.05
Coefficient of Variation	1.607

Mann-Kendall Test	
M-K Test Value (S)	-1209
Critical Value (0.05)	-1.645
Standard Deviation of S	193.5
Standardized Value of S	-6.243
Approximate p-value	2.147E-10

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Dichloromethane



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	163.5787
Standardized Value of S	-0.6174
M-K Test Value (S)	-102
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2685

OLS Regression Line (Blue)

OLS Regression Slope	-0.1130
OLS Regression Intercept	7.2837

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-19 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:45:10 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.7
Maximum	120
Mean	3.329
Geometric Mean	1.248
Median	1
Standard Deviation	14.49
Coefficient of Variation	4.353

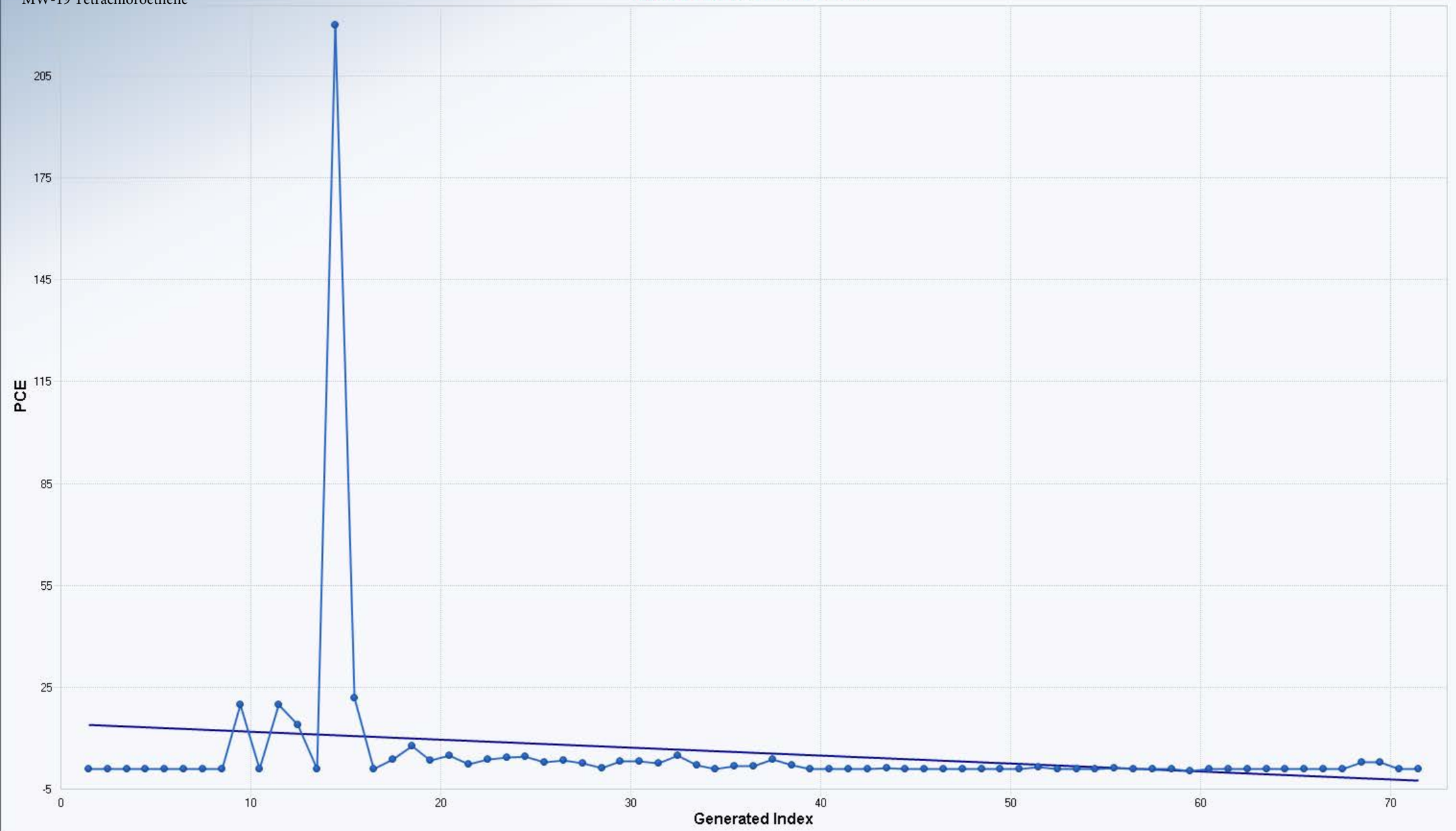
Mann-Kendall Test

M-K Test Value (S)	-102
Critical Value (0.05)	-1.645
Standard Deviation of S	163.6
Standardized Value of S	-0.617
Approximate p-value	0.268

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-19 Tetrachloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	186.3625
Standardized Value of S	-3.7239
M-K Test Value (S)	-695
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.2343
OLS Regression Intercept	14.3510

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:47:07 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

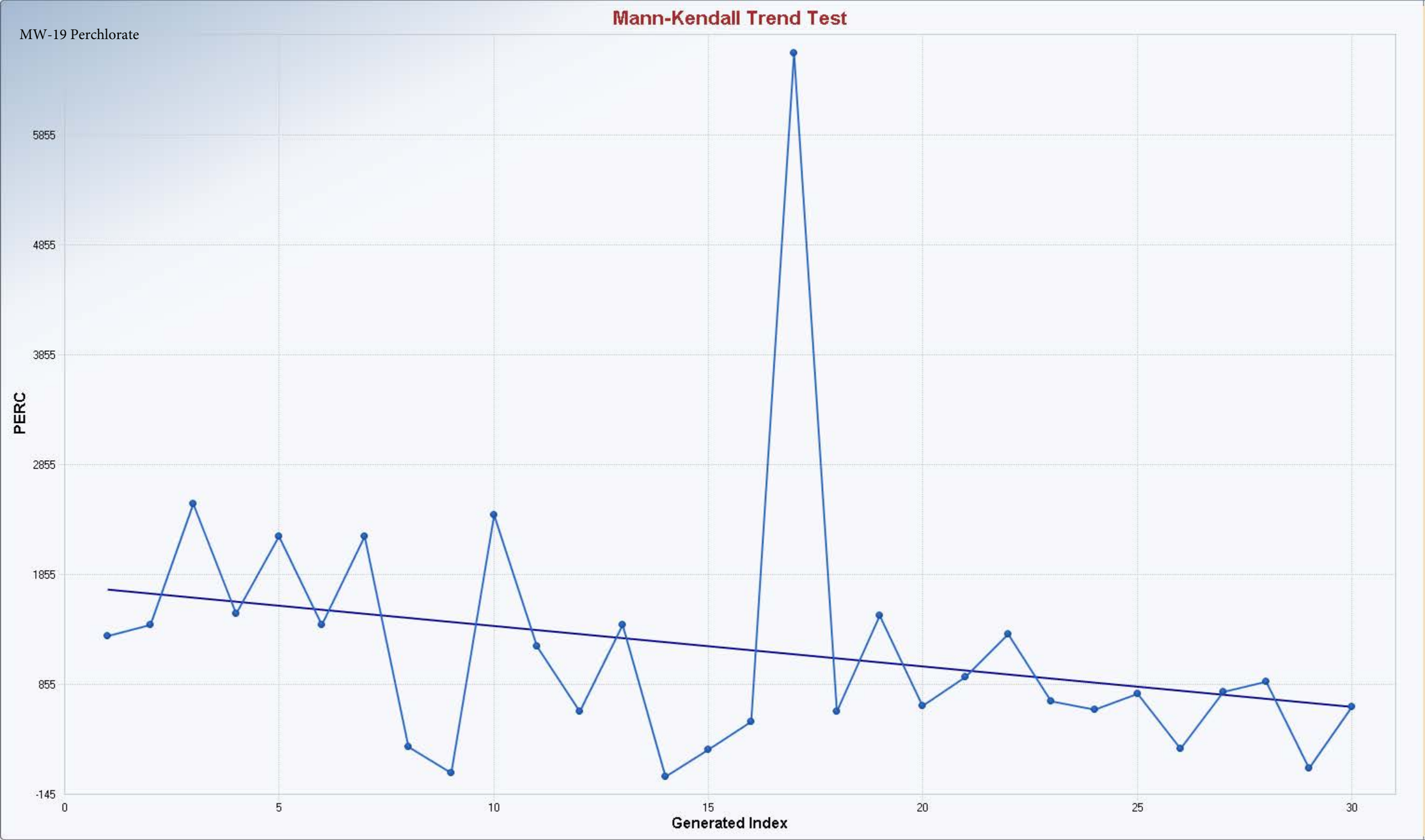
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.65
Maximum	220
Mean	5.918
Geometric Mean	1.882
Median	1
Standard Deviation	26.12
Coefficient of Variation	4.414

Mann-Kendall Test

M-K Test Value (S)	-695
Critical Value (0.05)	-1.645
Standard Deviation of S	186.4
Standardized Value of S	-3.724
Approximate p-value	9.8075E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0089
Standardized Value of S	-1.9283
M-K Test Value (S)	-109
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0269

OLS Regression Line (Blue)

OLS Regression Slope	-37.0417
OLS Regression Intercept	1,761.3825

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:30:19 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	71
Number Values Missing	41
Number Values Used	30
Minimum	20
Maximum	6600
Mean	1187
Geometric Mean	730.2
Median	835
Standard Deviation	1231
Coefficient of Variation	1.037

Mann-Kendall Test

M-K Test Value (S)	-109
Critical Value (0.05)	-1.645
Standard Deviation of S	56.01
Standardized Value of S	-1.928
Approximate p-value	0.0269

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Trichloroethene

Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.2122
Standardized Value of S	-8.0114
M-K Test Value (S)	-1,613
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.3777
OLS Regression Intercept	172.9310

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-19 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:50:37 AM	
From File	MW-19.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.5
Maximum	500
Mean	51.33
Geometric Mean	9.602
Median	7.6
Standard Deviation	127
Coefficient of Variation	2.474

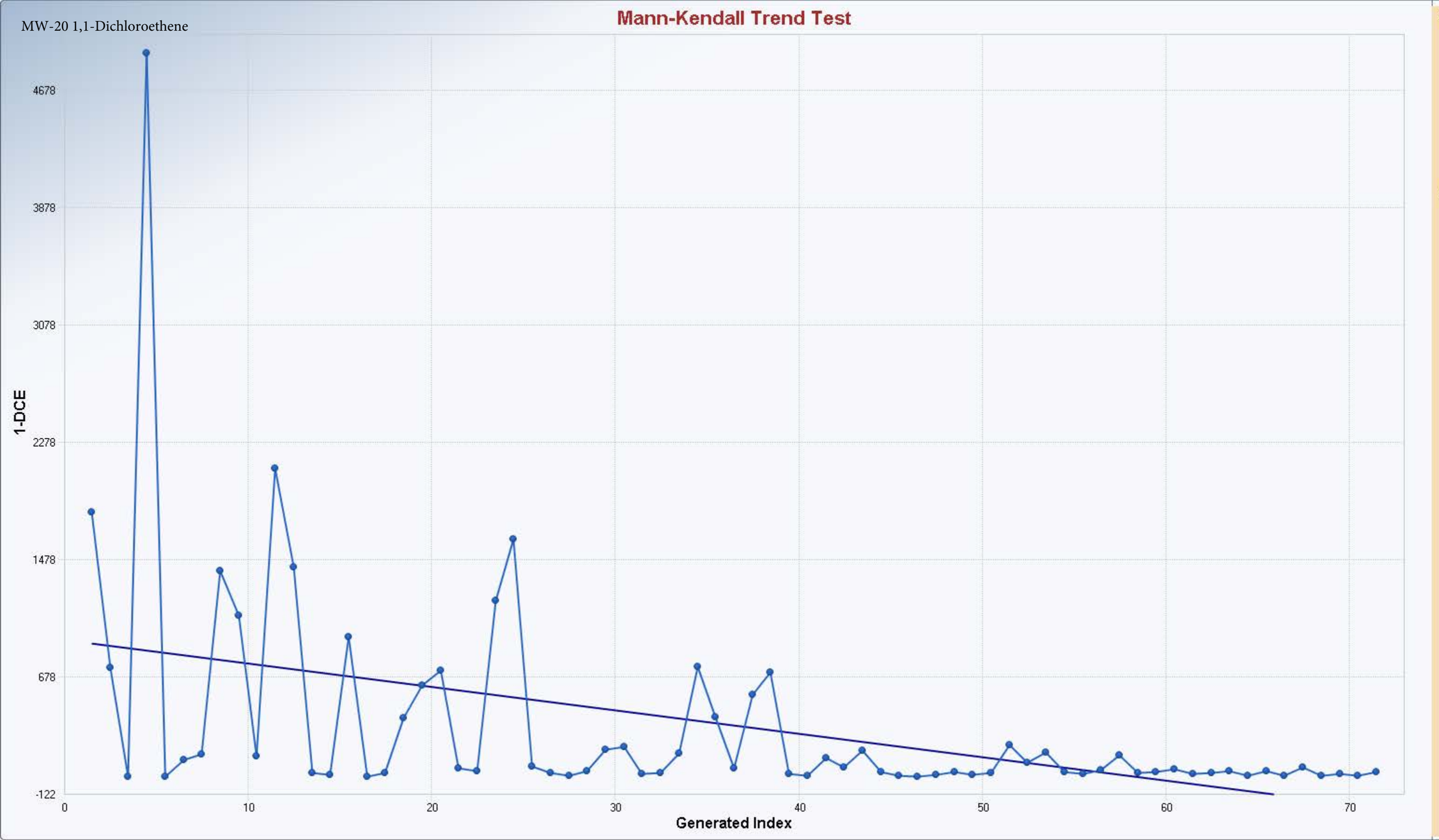
Mann-Kendall Test

M-K Test Value (S)	-1613
Critical Value (0.05)	-1.645
Standard Deviation of S	201.2
Standardized Value of S	-8.011
Approximate p-value	5.668E-16

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,1-Dichloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.4315
Standardized Value of S	-3.7382
M-K Test Value (S)	-754
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-16.0614
OLS Regression Intercept	920.5419

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:56:16 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	1
Maximum	4930
Mean	342.3
Geometric Mean	59.17
Median	44.5
Standard Deviation	730.1
Coefficient of Variation	2.133

Mann-Kendall Test

M-K Test Value (S)	-754
Critical Value (0.05)	-1.645
Standard Deviation of S	201.4
Standardized Value of S	-3.738
Approximate p-value	9.2656E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,1,1-Trichloroethane

Mann-Kendall Trend Test

Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.4605
Standardized Value of S	-6.2146
M-K Test Value (S)	-1,253
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-153.0507
OLS Regression Intercept	8,263.2381

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:54:23 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	7
Maximum	29300
Mean	2753
Geometric Mean	503.3
Median	511
Standard Deviation	5541
Coefficient of Variation	2.012

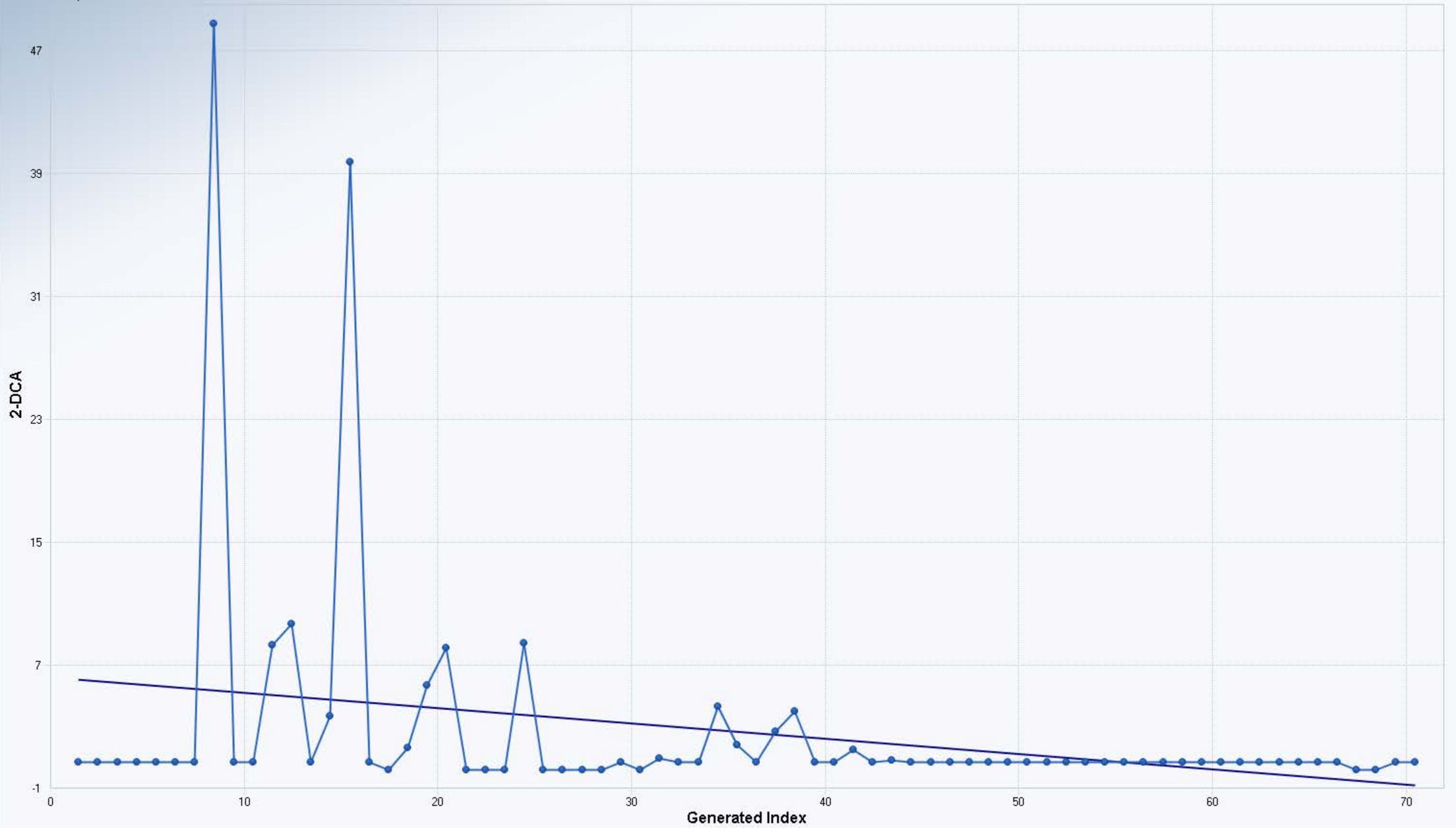
Mann-Kendall Test

M-K Test Value (S)	-1253
Critical Value (0.05)	-1.645
Standard Deviation of S	201.5
Standardized Value of S	-6.215
Approximate p-value	2.572E-10

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,2-Dichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	172.0843
Standardized Value of S	-1.6852
M-K Test Value (S)	-291
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0460

OLS Regression Line (Blue)

OLS Regression Slope	-0.0999
OLS Regression Intercept	6.4499

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:57:25 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	0.5
Maximum	49
Mean	2.903
Geometric Mean	1.297
Median	1
Standard Deviation	7.51
Coefficient of Variation	2.587

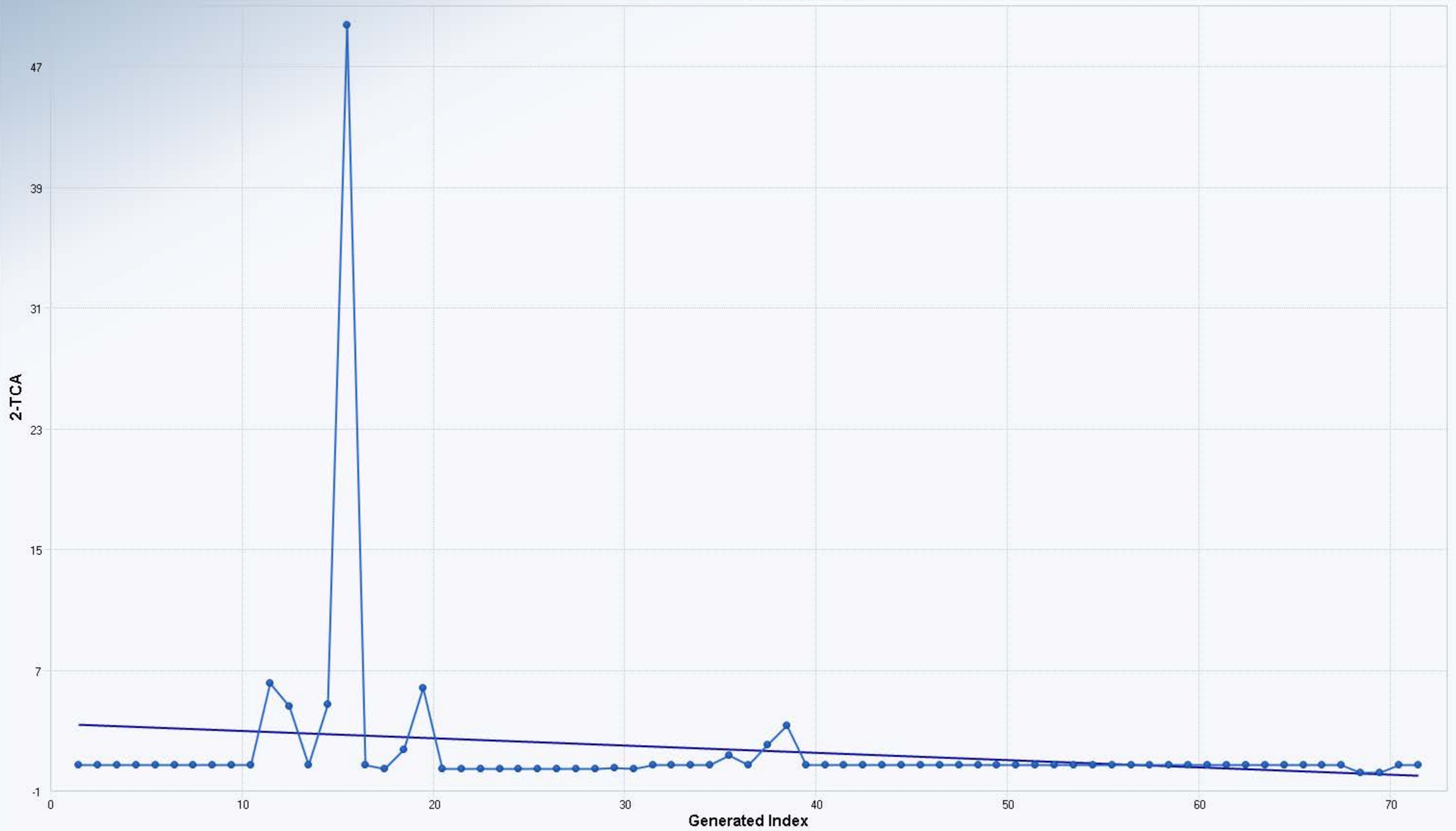
Mann-Kendall Test

M-K Test Value (S)	-291
Critical Value (0.05)	-1.645
Standard Deviation of S	172.1
Standardized Value of S	-1.685
Approximate p-value	0.046

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 1,1,2-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	166.6243
Standardized Value of S	-0.4561
M-K Test Value (S)	-77
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3242

OLS Regression Line (Blue)

OLS Regression Slope	-0.0481
OLS Regression Intercept	3.6965

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-20 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:55:26 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

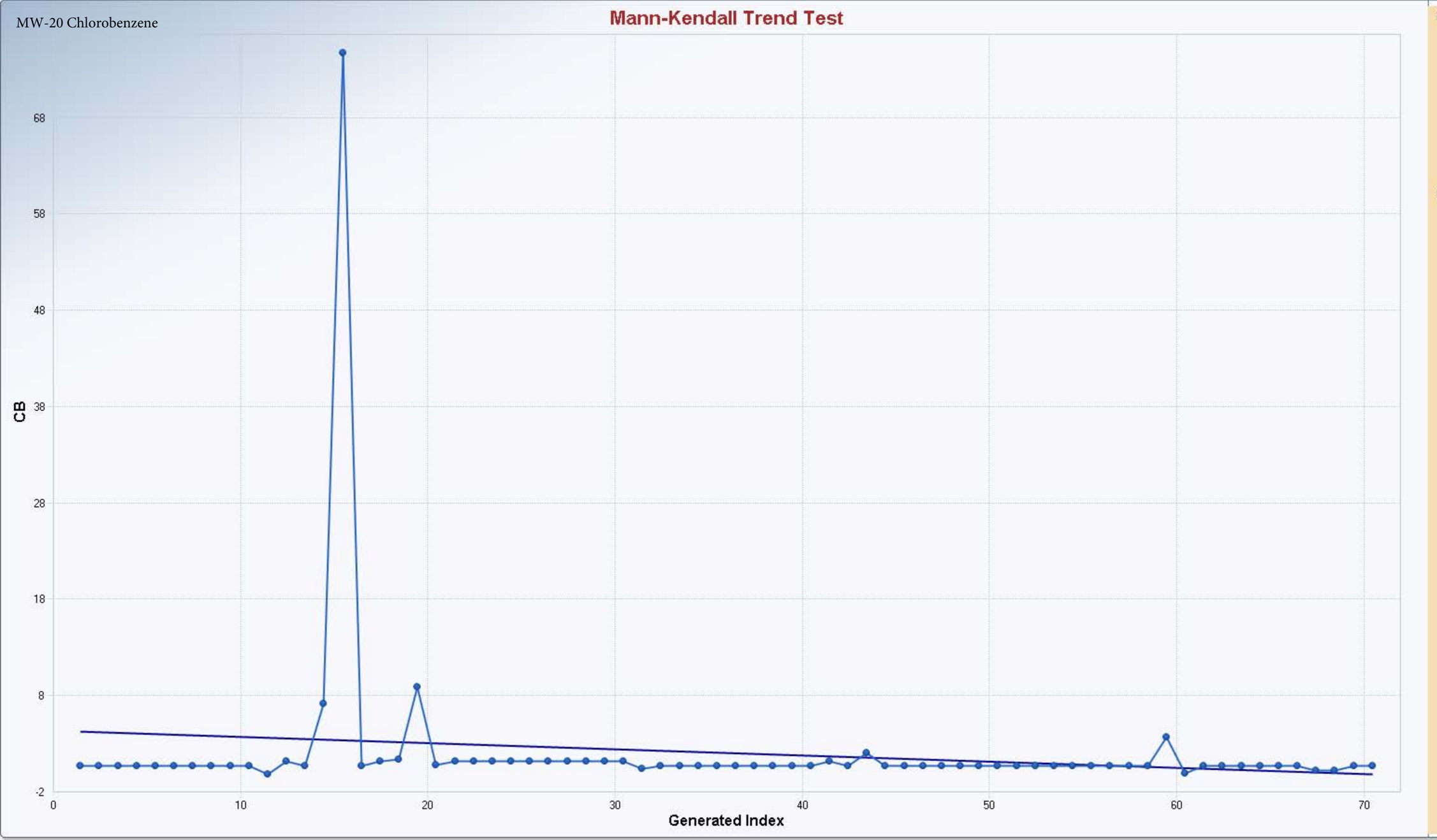
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	0.5
Maximum	50
Mean	1.963
Geometric Mean	1.127
Median	1
Standard Deviation	5.895
Coefficient of Variation	3.003

Mann-Kendall Test

M-K Test Value (S)	-77
Critical Value (0.05)	-1.645
Standard Deviation of S	166.6
Standardized Value of S	-0.456
Approximate p-value	0.324

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-20 Chlorobenzene



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	167.8948
Standardized Value of S	-2.7696
M-K Test Value (S)	-466
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0028

OLS Regression Line (Blue)

OLS Regression Slope	-0.0638
OLS Regression Intercept	4.6573

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:01:48 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

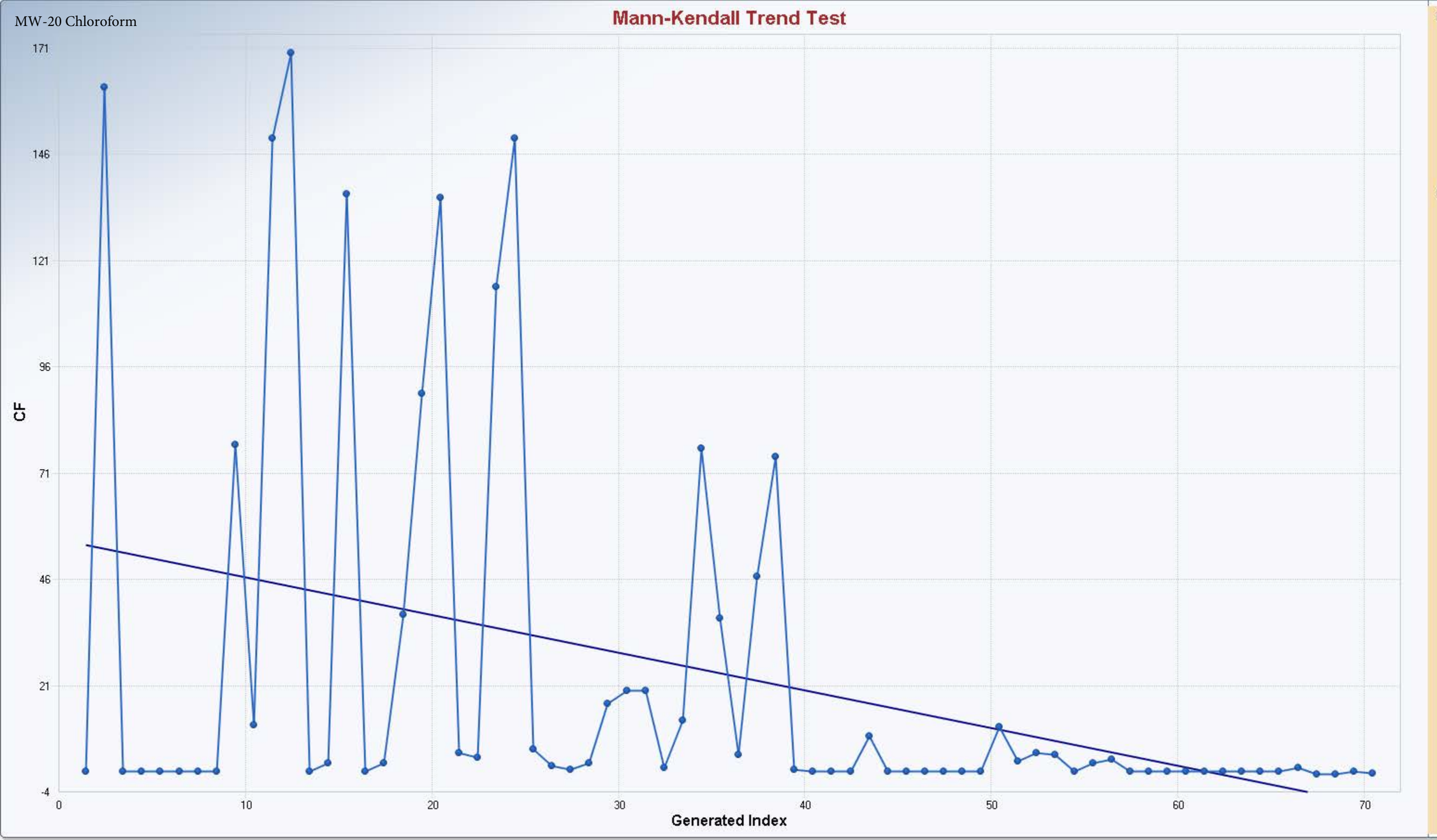
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	0.2
Maximum	75
Mean	2.394
Geometric Mean	1.188
Median	1
Standard Deviation	8.9
Coefficient of Variation	3.718

Mann-Kendall Test

M-K Test Value (S)	-466
Critical Value (0.05)	-1.645
Standard Deviation of S	167.9
Standardized Value of S	-2.77
Approximate p-value	0.00281

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Chloroform



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	190.6087
Standardized Value of S	-3.7144
M-K Test Value (S)	-709
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.8913
OLS Regression Intercept	55.2918

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:02:40 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CF

General Statistics

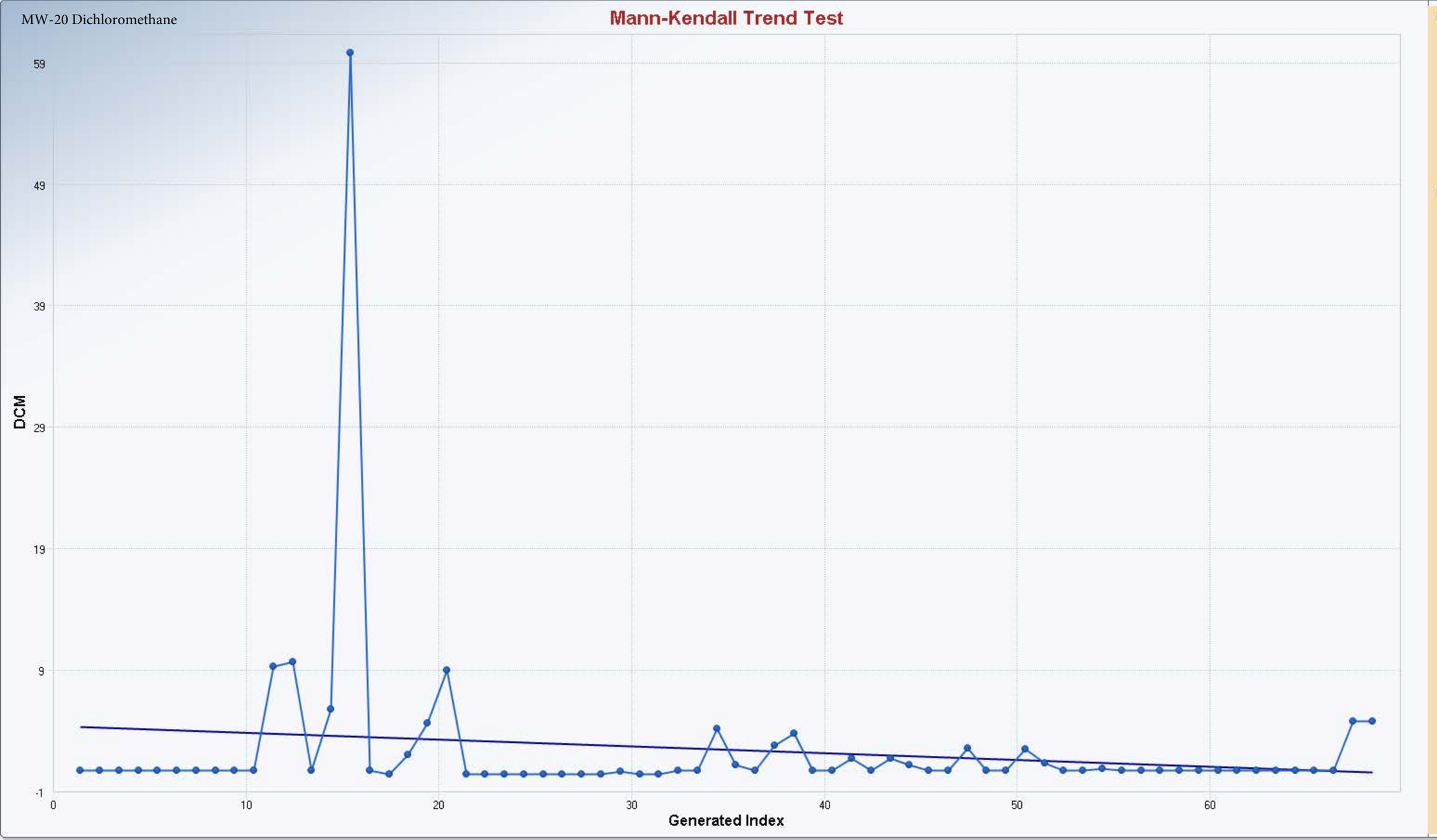
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	0.5
Maximum	170
Mean	23.65
Geometric Mean	4.167
Median	2
Standard Deviation	45.71
Coefficient of Variation	1.933

Mann-Kendall Test

M-K Test Value (S)	-709
Critical Value (0.05)	-1.645
Standard Deviation of S	190.6
Standardized Value of S	-3.714
Approximate p-value	1.0184E-4

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Dichloromethane



Mann-Kendall Trend Analysis

n	68
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	173.5819
Standardized Value of S	0.7316
M-K Test Value (S)	128
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2322

OLS Regression Line (Blue)

OLS Regression Slope	-0.0559
OLS Regression Intercept	4.6164

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-20 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:05:48 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

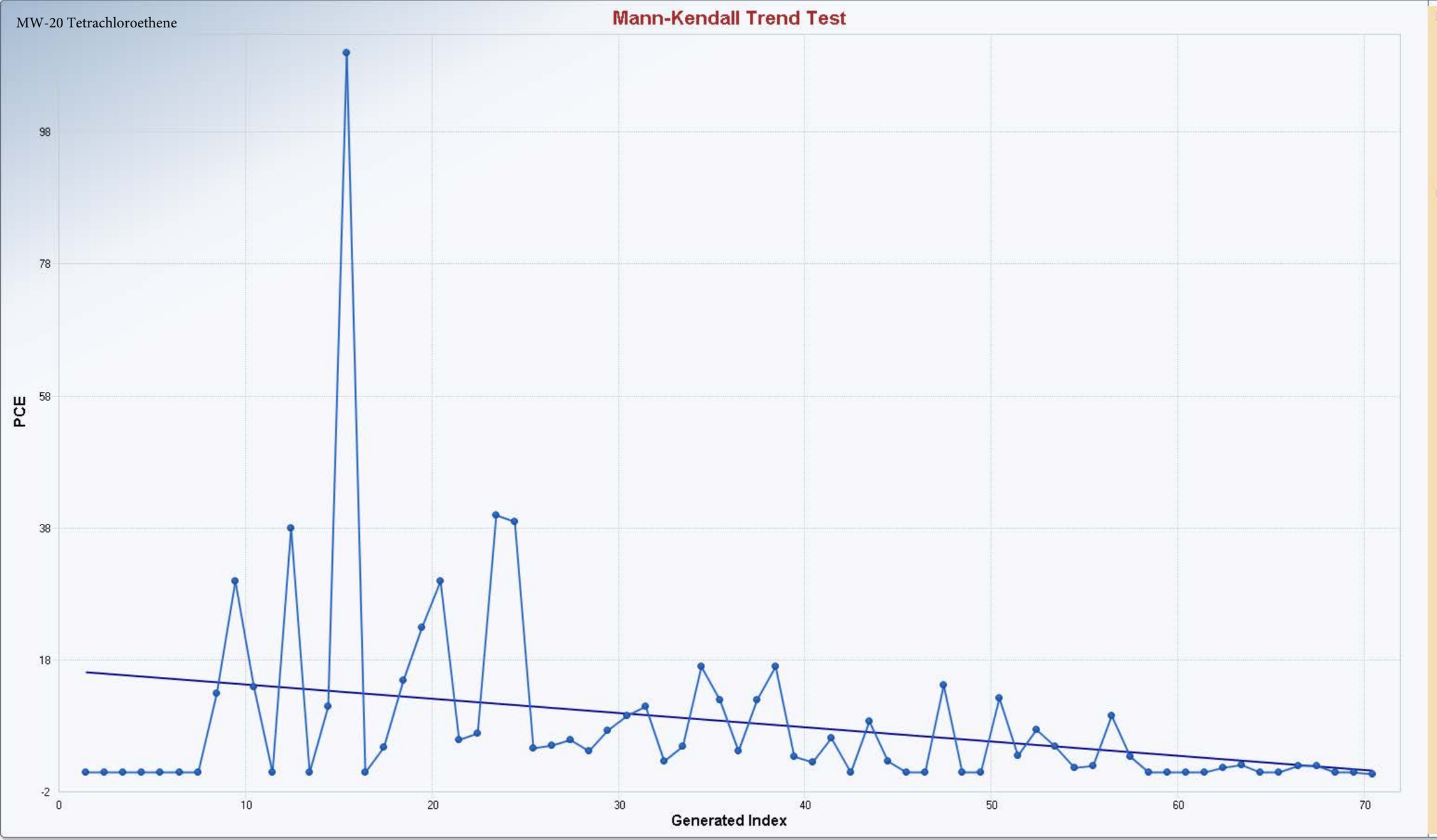
Number or Reported Events Not Used	0
Number of Generated Events	68
Number Values Reported (n)	71
Number Values Missing	3
Number Values Used	68
Minimum	0.7
Maximum	60
Mean	2.688
Geometric Mean	1.4
Median	1
Standard Deviation	7.345
Coefficient of Variation	2.732

Mann-Kendall Test

M-K Test Value (S)	128
Critical Value (0.05)	1.645
Standard Deviation of S	173.6
Standardized Value of S	0.732
Approximate p-value	0.232

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-20 Tetrachloroethene



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	193.5484
Standardized Value of S	-2.7073
M-K Test Value (S)	-525
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0034

OLS Regression Line (Blue)

OLS Regression Slope	-0.2171
OLS Regression Intercept	16.4694

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:07:57 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

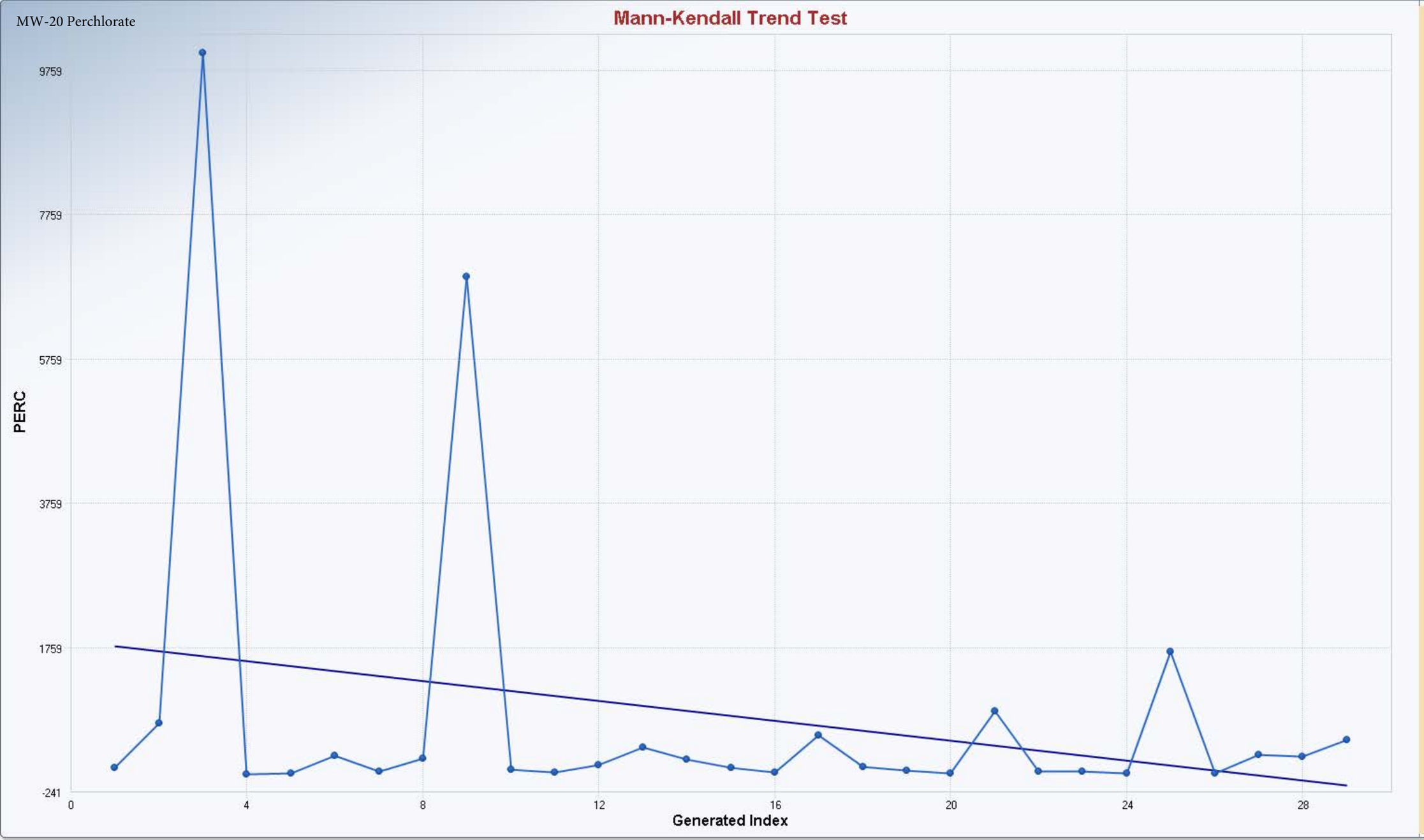
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	0.8
Maximum	110
Mean	8.761
Geometric Mean	3.797
Median	3.45
Standard Deviation	15.45
Coefficient of Variation	1.763

Mann-Kendall Test

M-K Test Value (S)	-525
Critical Value (0.05)	-1.645
Standard Deviation of S	193.5
Standardized Value of S	-2.707
Approximate p-value	0.00339

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Perchlorate



Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.3104
Standardized Value of S	-0.0563
M-K Test Value (S)	-4
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4776

OLS Regression Line (Blue)

OLS Regression Slope	-68.9635
OLS Regression Intercept	1,849.0463

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-20 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 8:51:37 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

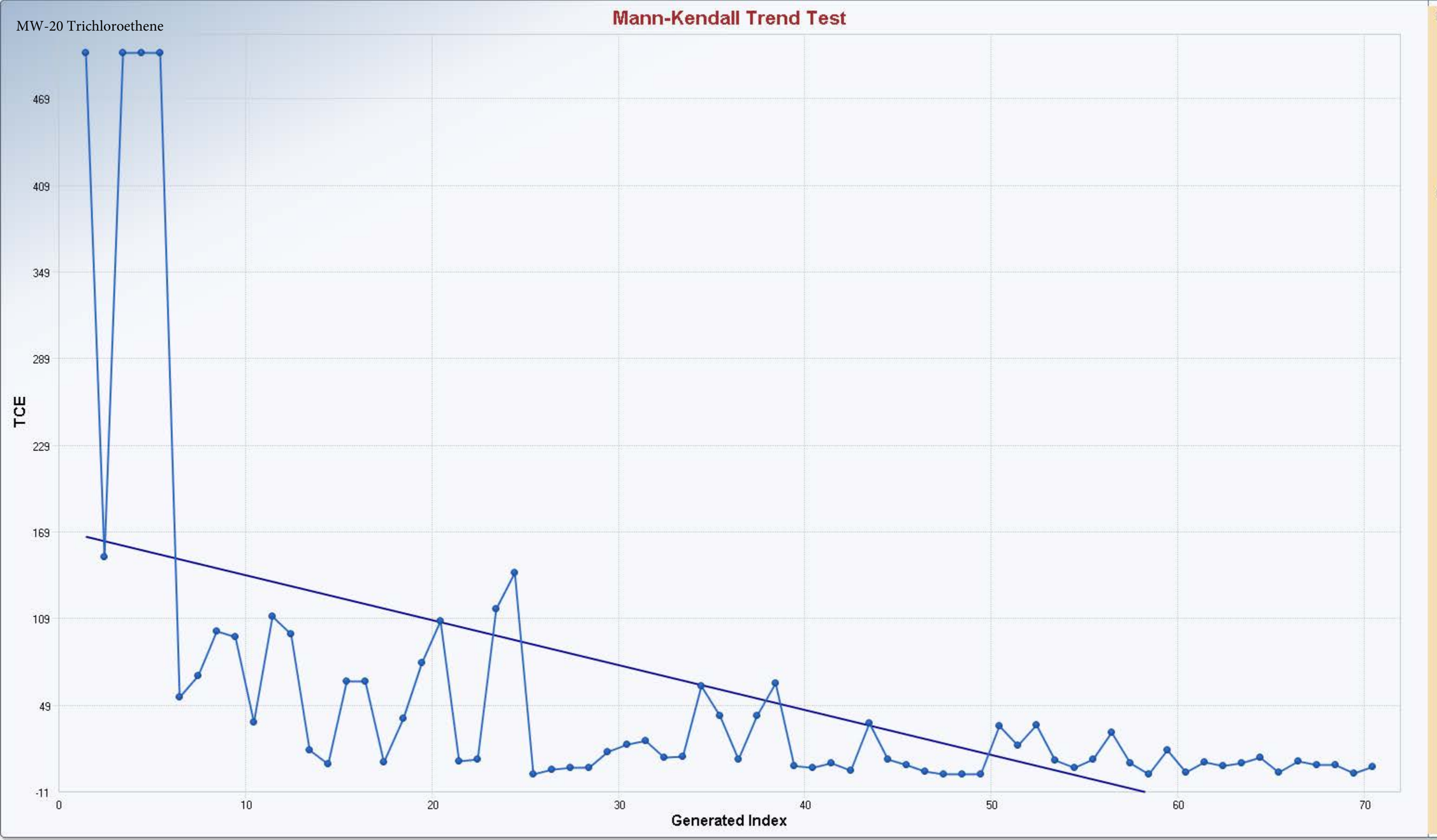
Number or Reported Events Not Used	0
Number of Generated Events	29
Number Values Reported (n)	71
Number Values Missing	42
Number Values Used	29
Minimum	9.1
Maximum	10000
Mean	814.6
Geometric Mean	140.6
Median	101
Standard Deviation	2184
Coefficient of Variation	2.681

Mann-Kendall Test

M-K Test Value (S)	-4
Critical Value (0.05)	-1.645
Standard Deviation of S	53.31
Standardized Value of S	-0.0563
Approximate p-value	0.478

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-20 Trichloroethene



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	197.1700
Standardized Value of S	-5.7463
M-K Test Value (S)	-1,134
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.1228
OLS Regression Intercept	168.4179

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:12:13 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

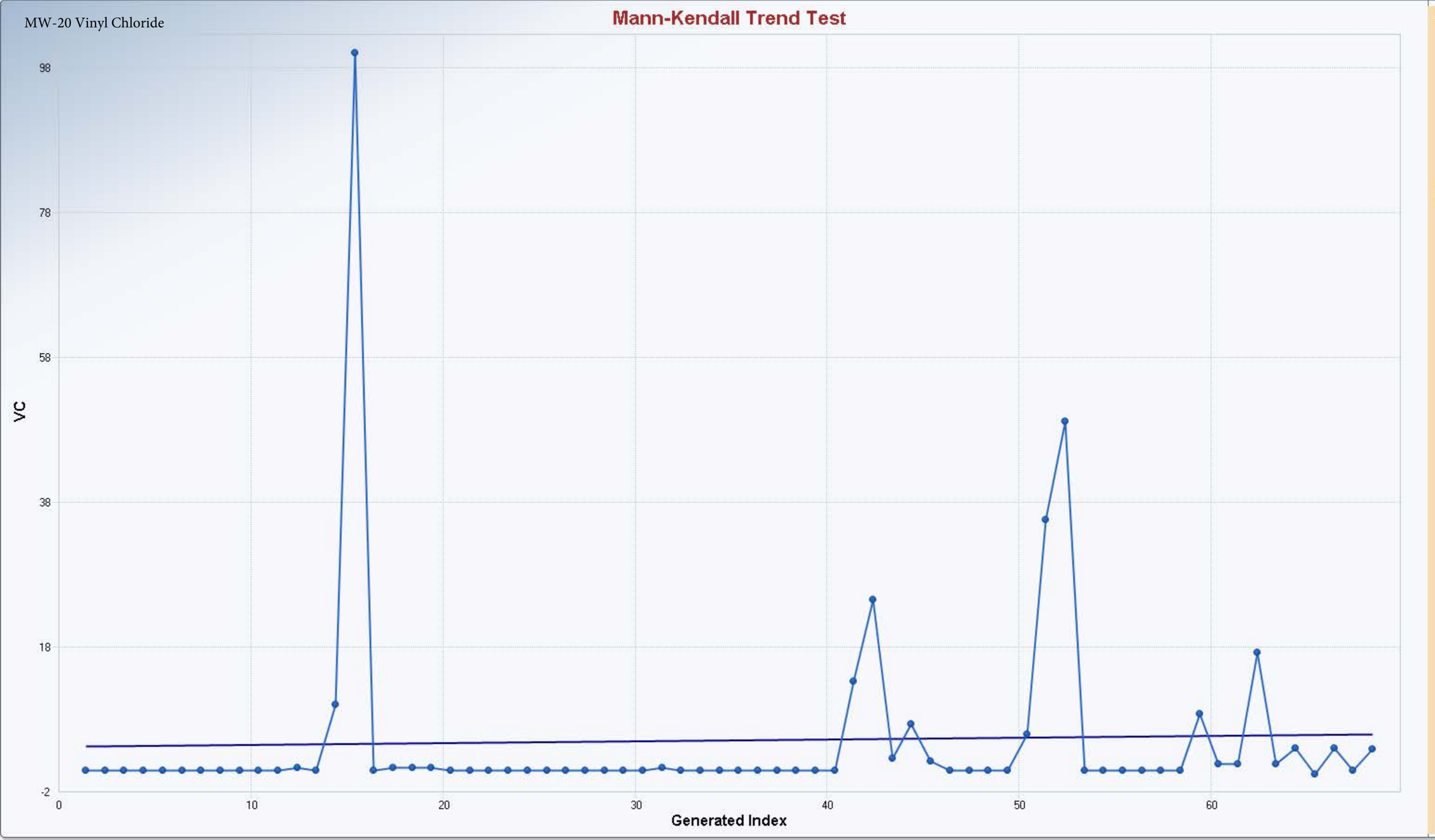
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	71
Number Values Missing	1
Number Values Used	70
Minimum	1
Maximum	500
Mean	57.56
Geometric Mean	17.23
Median	12.15
Standard Deviation	115.6
Coefficient of Variation	2.008

Mann-Kendall Test

M-K Test Value (S)	-1134
Critical Value (0.05)	-1.645
Standard Deviation of S	197.2
Standardized Value of S	-5.746
Approximate p-value	4.5606E-9

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-20 Vinyl Chloride



Mann-Kendall Trend Analysis

n	68
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	160.9182
Standardized Value of S	2.4049
M-K Test Value (S)	388
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0081

OLS Regression Line (Blue)

OLS Regression Slope	0.0253
OLS Regression Intercept	4.2141

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-20 Vinyl Chloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:13:44 AM	
From File	MW-20.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

VC

General Statistics

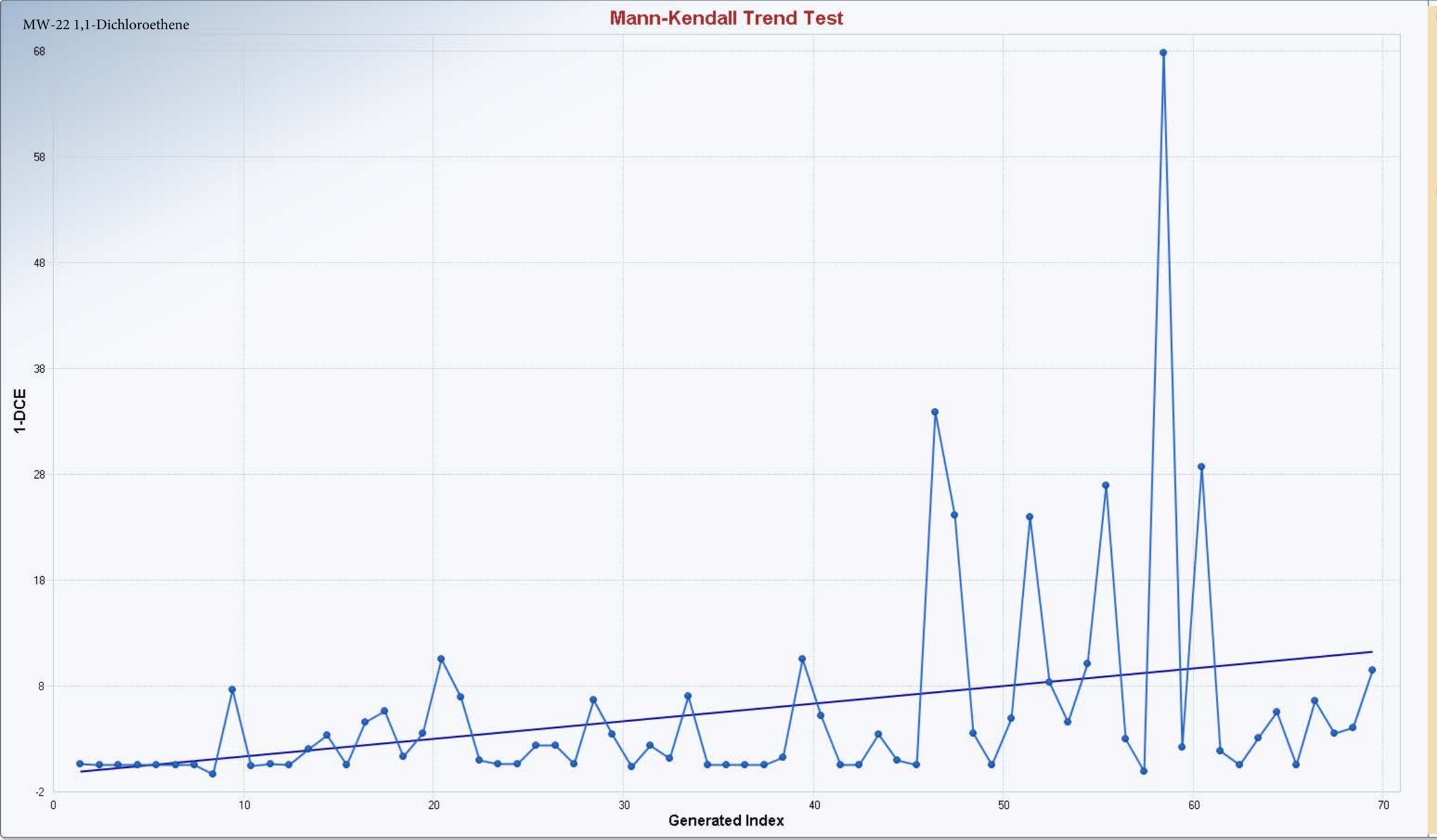
Number or Reported Events Not Used	0
Number of Generated Events	68
Number Values Reported (n)	71
Number Values Missing	3
Number Values Used	68
Minimum	0.5
Maximum	100
Mean	5.086
Geometric Mean	1.742
Median	1
Standard Deviation	14.14
Coefficient of Variation	2.78

Mann-Kendall Test

M-K Test Value (S)	388
Critical Value (0.05)	1.645
Standard Deviation of S	160.9
Standardized Value of S	2.405
Approximate p-value	0.00809

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-22 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	191.1814
Standardized Value of S	3.1907
M-K Test Value (S)	611
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0007

OLS Regression Line (Blue)

OLS Regression Slope	0.1666
OLS Regression Intercept	0.1679

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-22 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:21:12 AM	
From File	MW-22.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

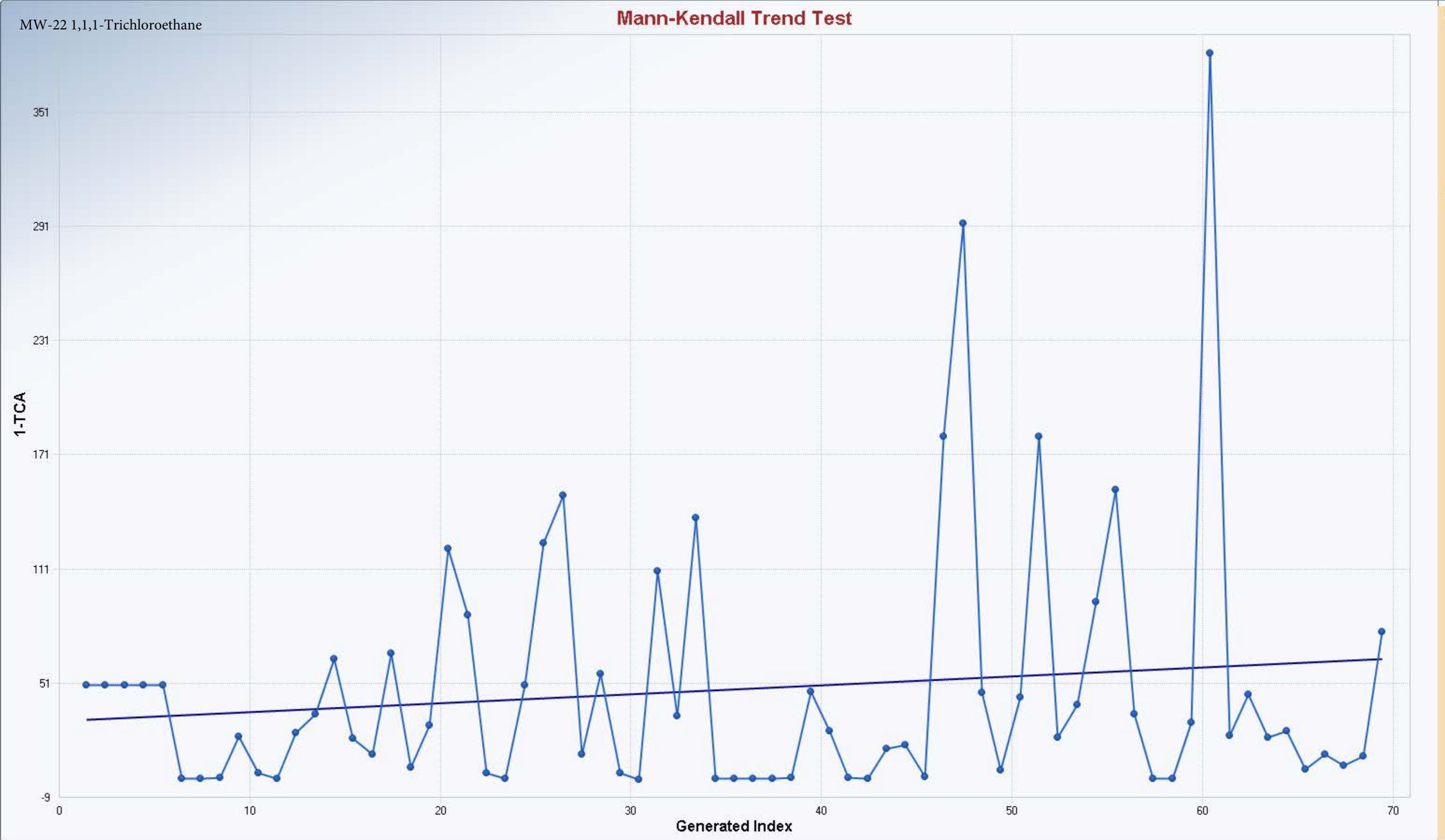
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	69
Minimum	0.14
Maximum	68.2
Mean	5.999
Geometric Mean	2.764
Median	2.67
Standard Deviation	10.4
Coefficient of Variation	1.733

Mann-Kendall Test

M-K Test Value (S)	611
Critical Value (0.05)	1.645
Standard Deviation of S	191.2
Standardized Value of S	3.191
Approximate p-value	7.0968E-4

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-22 1,1,1-Trichloroethane



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.7416
Standardized Value of S	0.1920
M-K Test Value (S)	38
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4239

OLS Regression Line (Blue)

OLS Regression Slope	0.4728
OLS Regression Intercept	31.3855

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-22 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:30:08 AM	
From File	MW-22.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

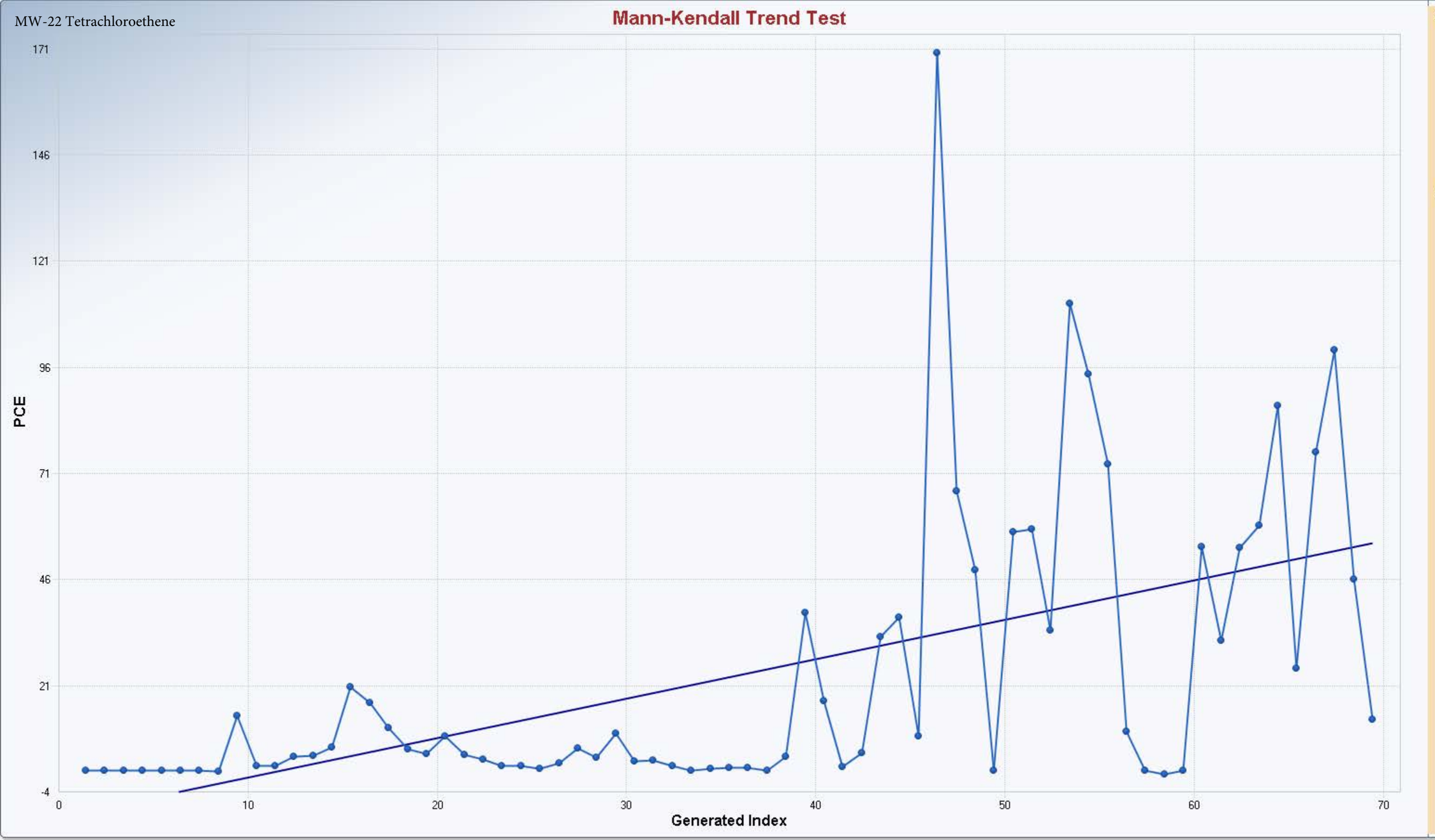
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	69
Minimum	0.8
Maximum	382
Mean	47.93
Geometric Mean	16.34
Median	25.3
Standard Deviation	68.28
Coefficient of Variation	1.425

Mann-Kendall Test

M-K Test Value (S)	38
Critical Value (0.05)	1.645
Standard Deviation of S	192.7
Standardized Value of S	0.192
Approximate p-value	0.424

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-22 Tetrachloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.4994
Standardized Value of S	4.7637
M-K Test Value (S)	918
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.9337
OLS Regression Intercept	-9.7840

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-22 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:32:37 AM	
From File	MW-22.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

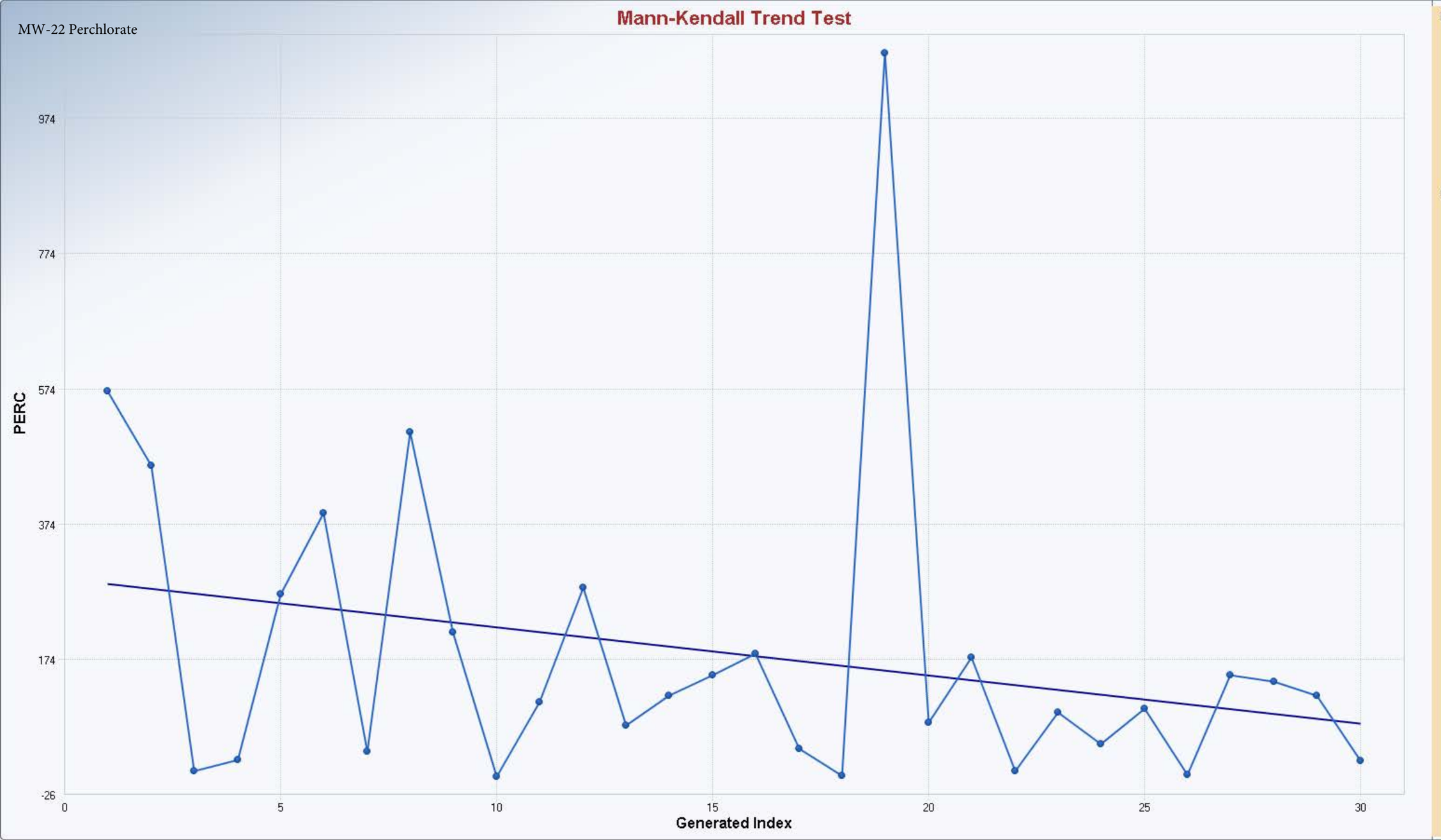
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	69
Minimum	0.23
Maximum	170
Mean	22.9
Geometric Mean	7.169
Median	5.2
Standard Deviation	33.5
Coefficient of Variation	1.463

Mann-Kendall Test

M-K Test Value (S)	918
Critical Value (0.05)	1.645
Standard Deviation of S	192.5
Standardized Value of S	4.764
Approximate p-value	9.5060E-7

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-22 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-1.4634
M-K Test Value (S)	-83
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0717

OLS Regression Line (Blue)

OLS Regression Slope	-7.1385
OLS Regression Intercept	292.5518

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-22 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:14:36 AM	
From File	MW-22.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

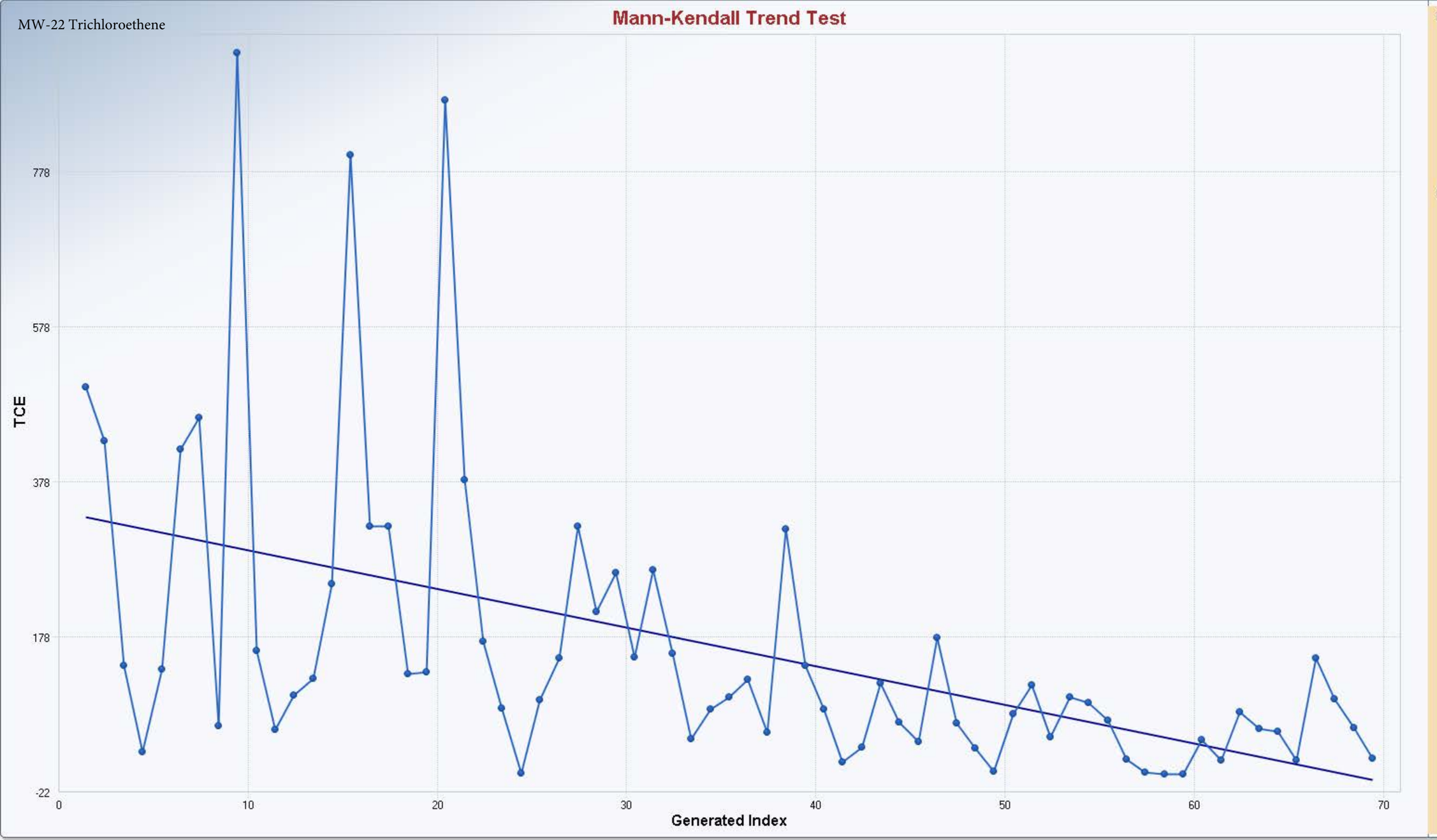
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	69
Number Values Missing	39
Number Values Used	30
Minimum	0.5
Maximum	1070
Mean	181.9
Geometric Mean	70.19
Median	115
Standard Deviation	227.8
Coefficient of Variation	1.253

Mann-Kendall Test

M-K Test Value (S)	-83
Critical Value (0.05)	-1.645
Standard Deviation of S	56.03
Standardized Value of S	-1.463
Approximate p-value	0.0717

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-22 Trichloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	193.0509
Standardized Value of S	-5.2577
M-K Test Value (S)	-1,016
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-4.9793
OLS Regression Intercept	337.4120

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-22 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:49:14 AM	
From File	MW-22.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

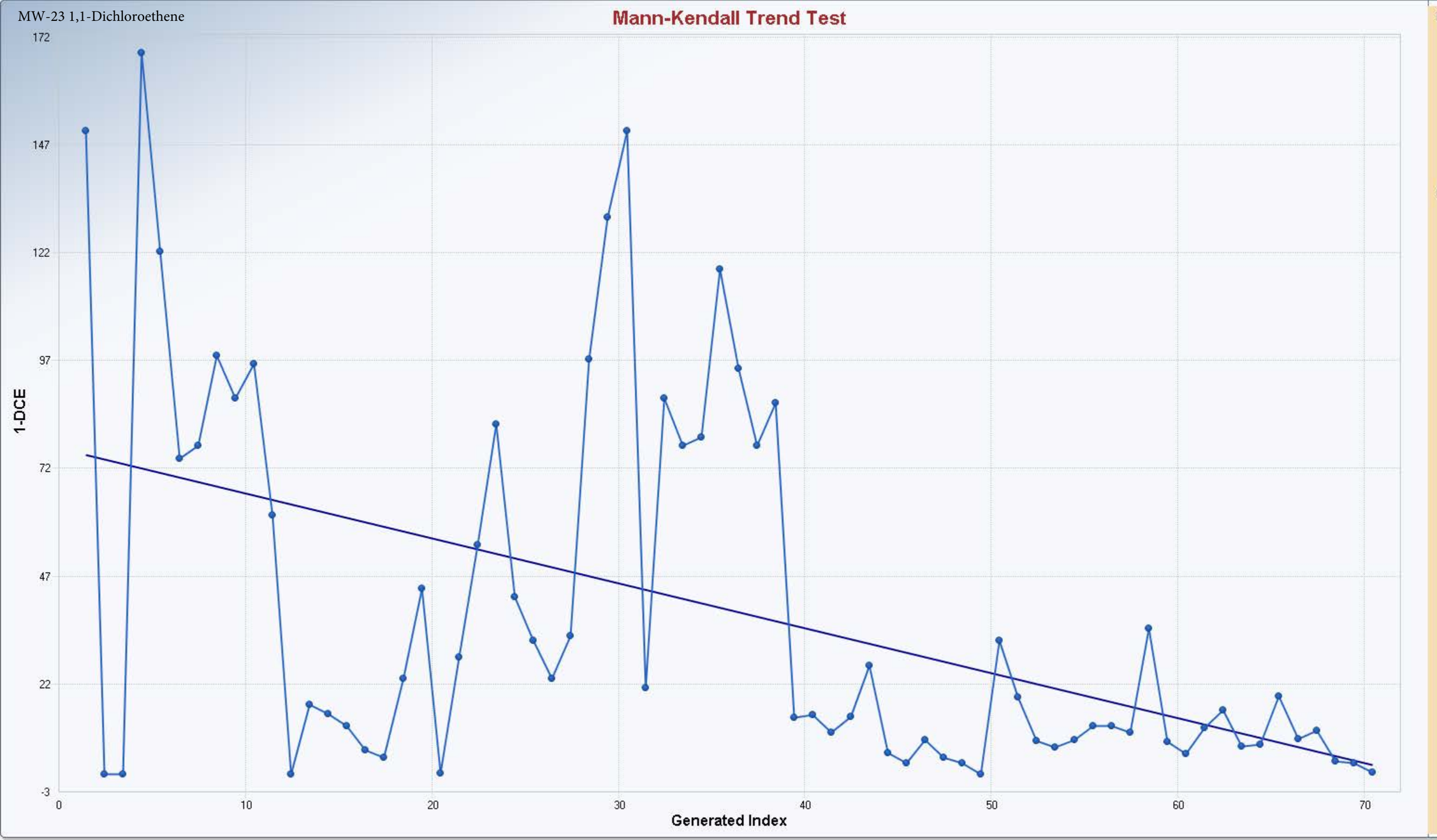
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	69
Minimum	1
Maximum	930
Mean	163.1
Geometric Mean	83.55
Median	99.4
Standard Deviation	192
Coefficient of Variation	1.177

Mann-Kendall Test

M-K Test Value (S)	-1016
Critical Value (0.05)	-1.645
Standard Deviation of S	193.1
Standardized Value of S	-5.258
Approximate p-value	7.2942E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	197.1869
Standardized Value of S	-3.9607
M-K Test Value (S)	-782
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.0434
OLS Regression Intercept	76.0470

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:08:56 AM	
From File	MW-23.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	70
Minimum	1
Maximum	168
Mean	39
Geometric Mean	18.21
Median	16.4
Standard Deviation	43.47
Coefficient of Variation	1.115

Mann-Kendall Test

M-K Test Value (S)	-782
Critical Value (0.05)	-1.645
Standard Deviation of S	197.2
Standardized Value of S	-3.961
Approximate p-value	3.7364E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 1,1,1-Trichloroethane

Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	193.0535
Standardized Value of S	-5.4907
M-K Test Value (S)	-1,061
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-10.6210
OLS Regression Intercept	767.8875

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:59:24 AM	
From File	MW-23.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

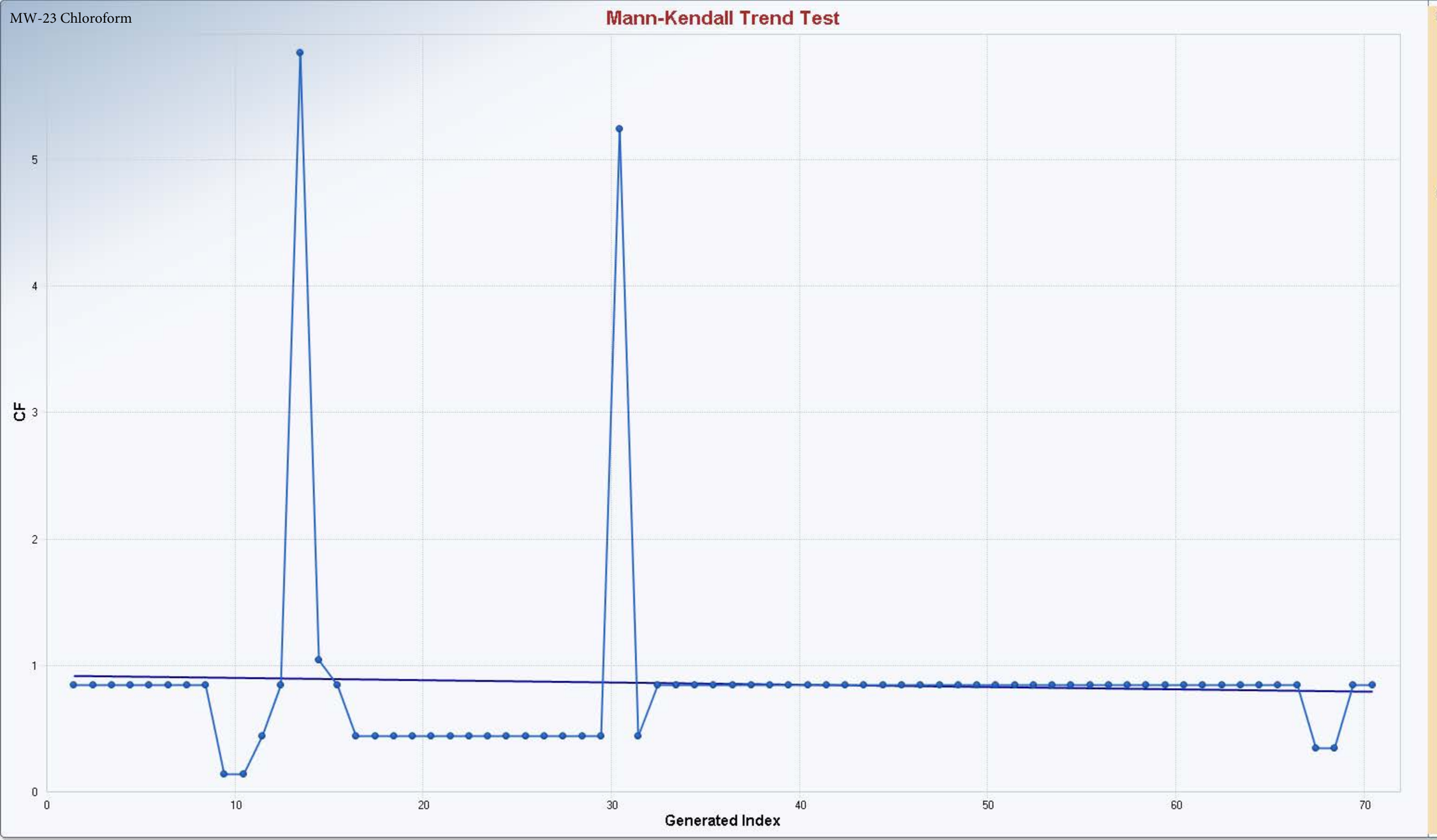
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	70
Number Values Missing	1
Number Values Used	69
Minimum	7.9
Maximum	1600
Mean	396.2
Geometric Mean	181.8
Median	197
Standard Deviation	422.4
Coefficient of Variation	1.066

Mann-Kendall Test

M-K Test Value (S)	-1061
Critical Value (0.05)	-1.645
Standard Deviation of S	193.1
Standardized Value of S	-5.491
Approximate p-value	2.0017E-8

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 Chloroform



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	162.8558
Standardized Value of S	1.9342
M-K Test Value (S)	316
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0265

OLS Regression Line (Blue)

OLS Regression Slope	-0.0018
OLS Regression Intercept	1.0763

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-23 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:10:36 AM	
From File	MW-23.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

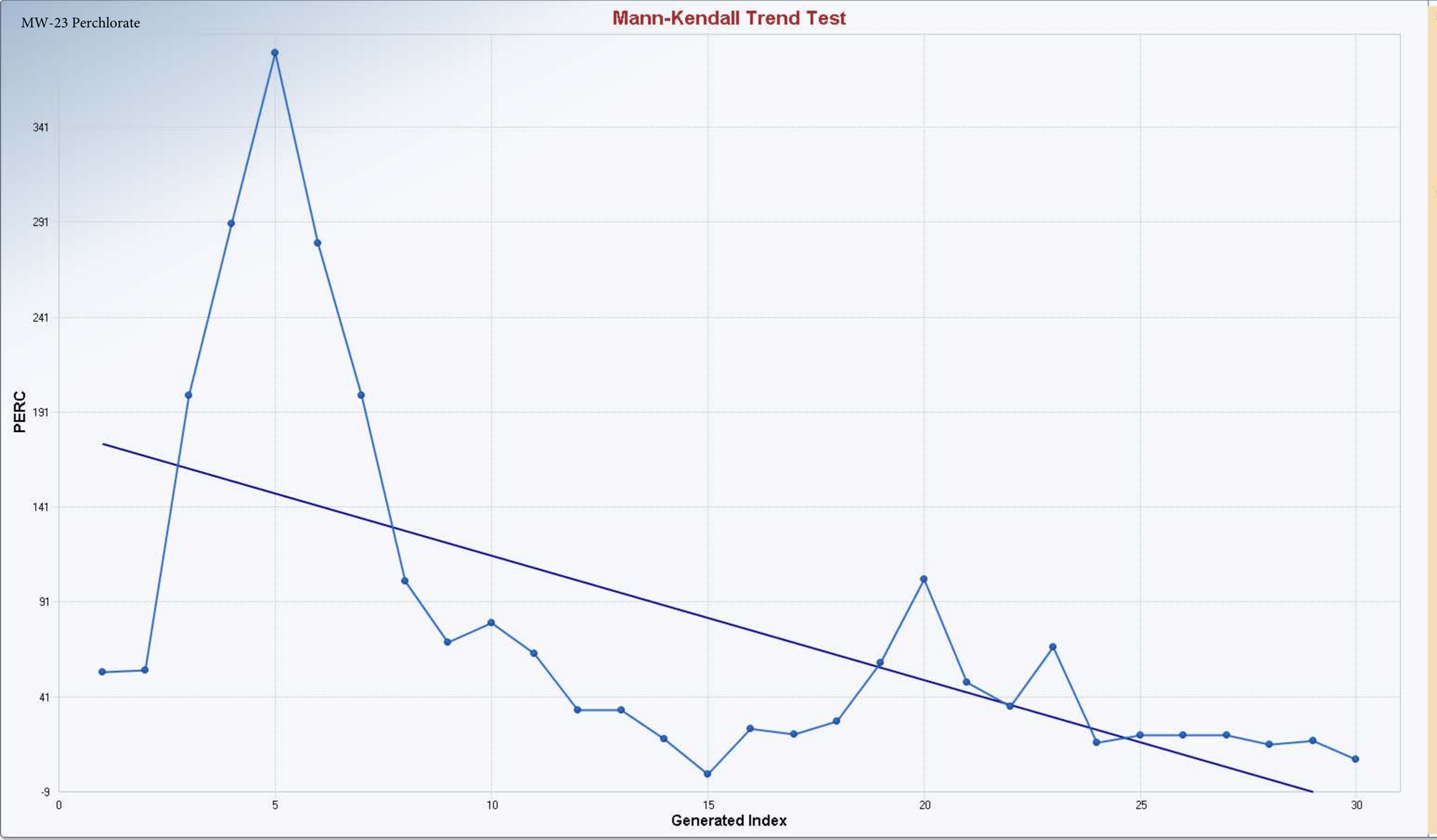
CF

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	70
Minimum	0.3
Maximum	6
Mean	1.011
Geometric Mean	0.888
Median	1
Standard Deviation	0.838
Coefficient of Variation	0.828

Mann-Kendall Test	
M-K Test Value (S)	316
Critical Value (0.05)	1.645
Standard Deviation of S	162.9
Standardized Value of S	1.934
Approximate p-value	0.0265

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-23 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0000
Standardized Value of S	-4.1964
M-K Test Value (S)	-236
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-6.5575
OLS Regression Intercept	180.6917

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 9:58:19 AM	
From File	MW-23.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	70
Number Values Missing	40
Number Values Used	30
Minimum	0.5
Maximum	380
Mean	79.05
Geometric Mean	42.12
Median	42.3
Standard Deviation	94.71
Coefficient of Variation	1.198

Mann-Kendall Test

M-K Test Value (S)	-236
Critical Value (0.05)	-1.645
Standard Deviation of S	56
Standardized Value of S	-4.196
Approximate p-value	1.3558E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 Trichloroethene

Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.7892
Standardized Value of S	-9.4196
M-K Test Value (S)	-1,817
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.7757
OLS Regression Intercept	90.5728

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-23 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:11:45 AM	
From File	MW-23.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

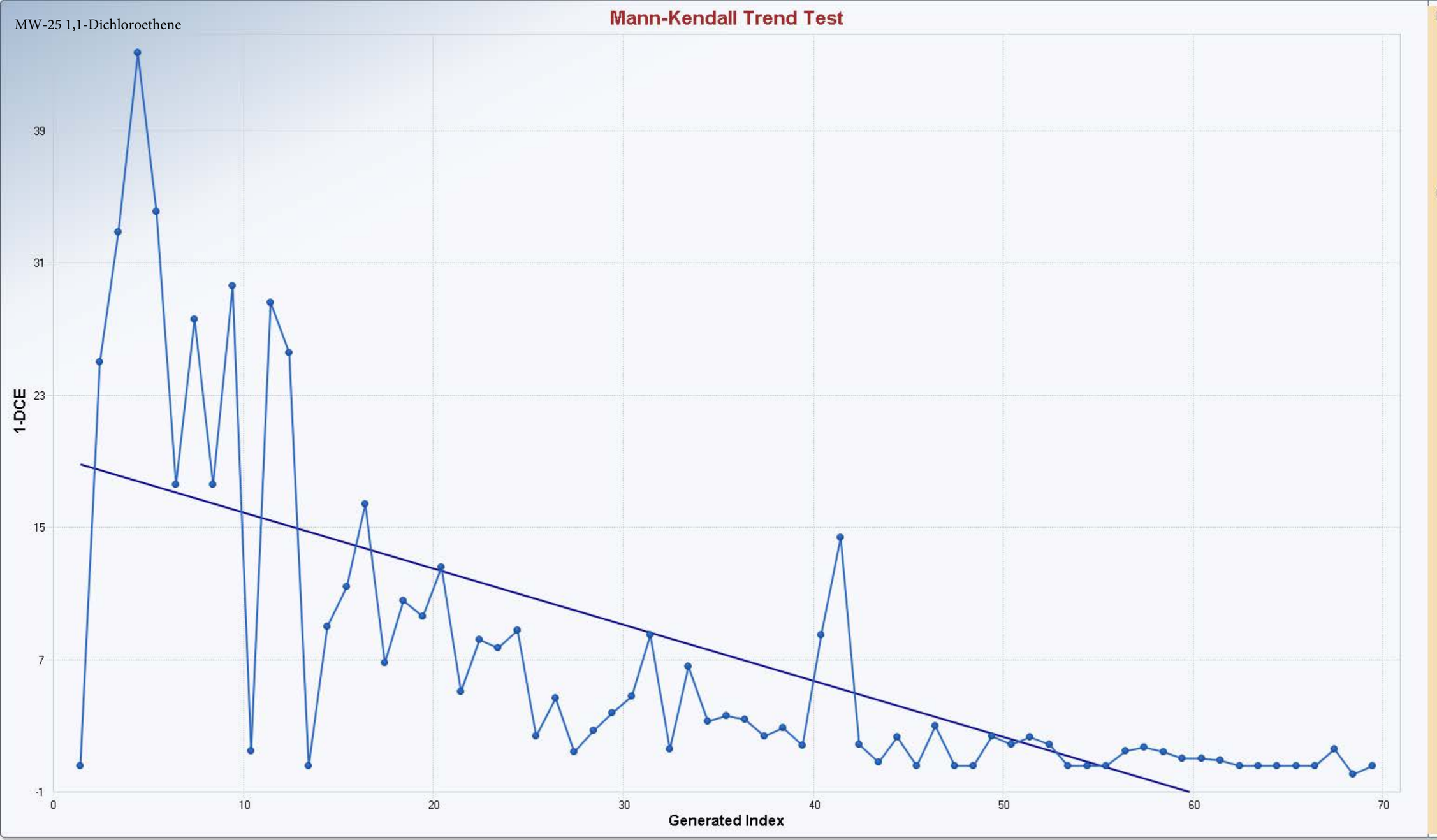
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	70
Number Values Missing	1
Number Values Used	69
Minimum	0.5
Maximum	205
Mean	28.42
Geometric Mean	7.363
Median	6.7
Standard Deviation	51.58
Coefficient of Variation	1.815

Mann-Kendall Test

M-K Test Value (S)	-1817
Critical Value (0.05)	-1.645
Standard Deviation of S	192.8
Standardized Value of S	-9.42
Approximate p-value	2.264E-21

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 1,1-Dichloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.1701
Standardized Value of S	-7.6339
M-K Test Value (S)	-1,468
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3404
OLS Regression Intercept	19.5767

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:23:56 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	70
Number Values Missing	1
Number Values Used	69
Minimum	0.5
Maximum	44.1
Mean	7.661
Geometric Mean	3.844
Median	2.8
Standard Deviation	9.833
Coefficient of Variation	1.283

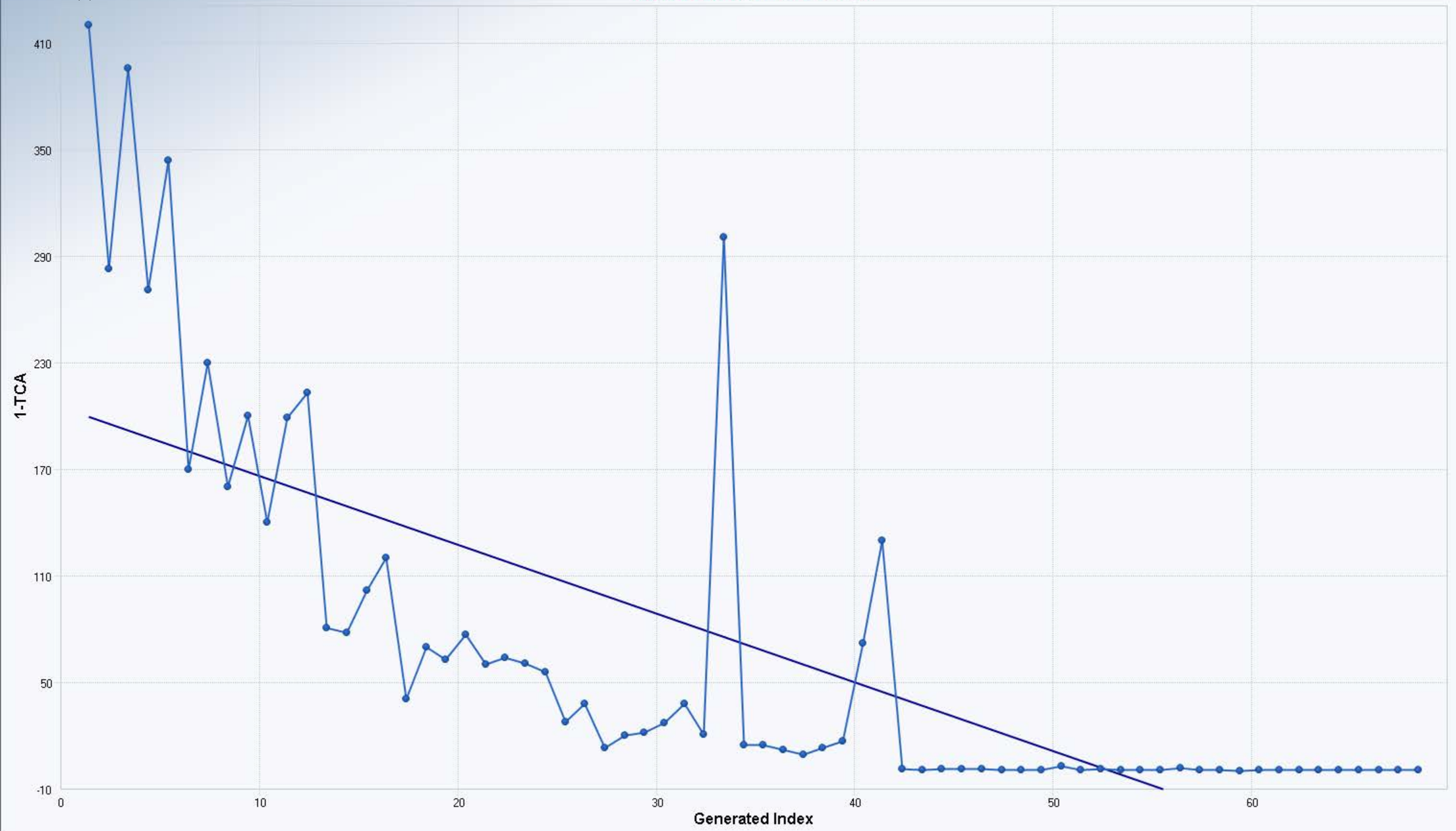
Mann-Kendall Test

M-K Test Value (S)	-1468
Critical Value (0.05)	-1.645
Standard Deviation of S	192.2
Standardized Value of S	-7.634
Approximate p-value	1.139E-14

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	68
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	187.3402
Standardized Value of S	-9.3306
M-K Test Value (S)	-1,749
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.8809
OLS Regression Intercept	203.3179

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:22:48 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

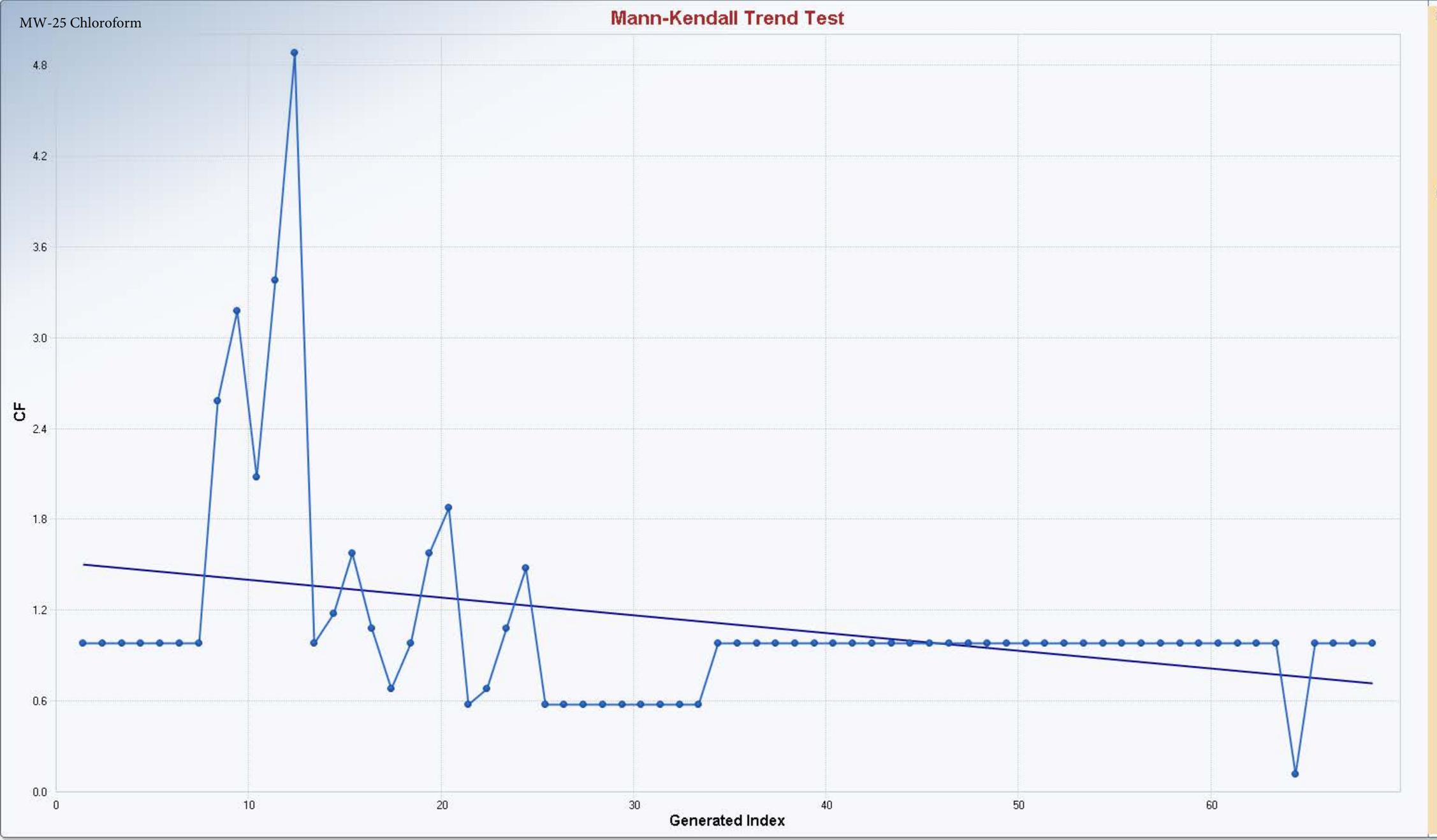
Number or Reported Events Not Used	0
Number of Generated Events	68
Number Values Reported (n)	70
Number Values Missing	2
Number Values Used	68
Minimum	0.44
Maximum	420
Mean	69.43
Geometric Mean	12.99
Median	18.5
Standard Deviation	103.5
Coefficient of Variation	1.491

Mann-Kendall Test

M-K Test Value (S)	-1749
Critical Value (0.05)	-1.645
Standard Deviation of S	187.3
Standardized Value of S	-9.331
Approximate p-value	5.263E-21

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Chloroform



Mann-Kendall Trend Analysis

n	68
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	162.5741
Standardized Value of S	-1.5747
M-K Test Value (S)	-257
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0577

OLS Regression Line (Blue)

OLS Regression Slope	-0.0117
OLS Regression Intercept	1.5331

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-25 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:25:06 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CF

General Statistics

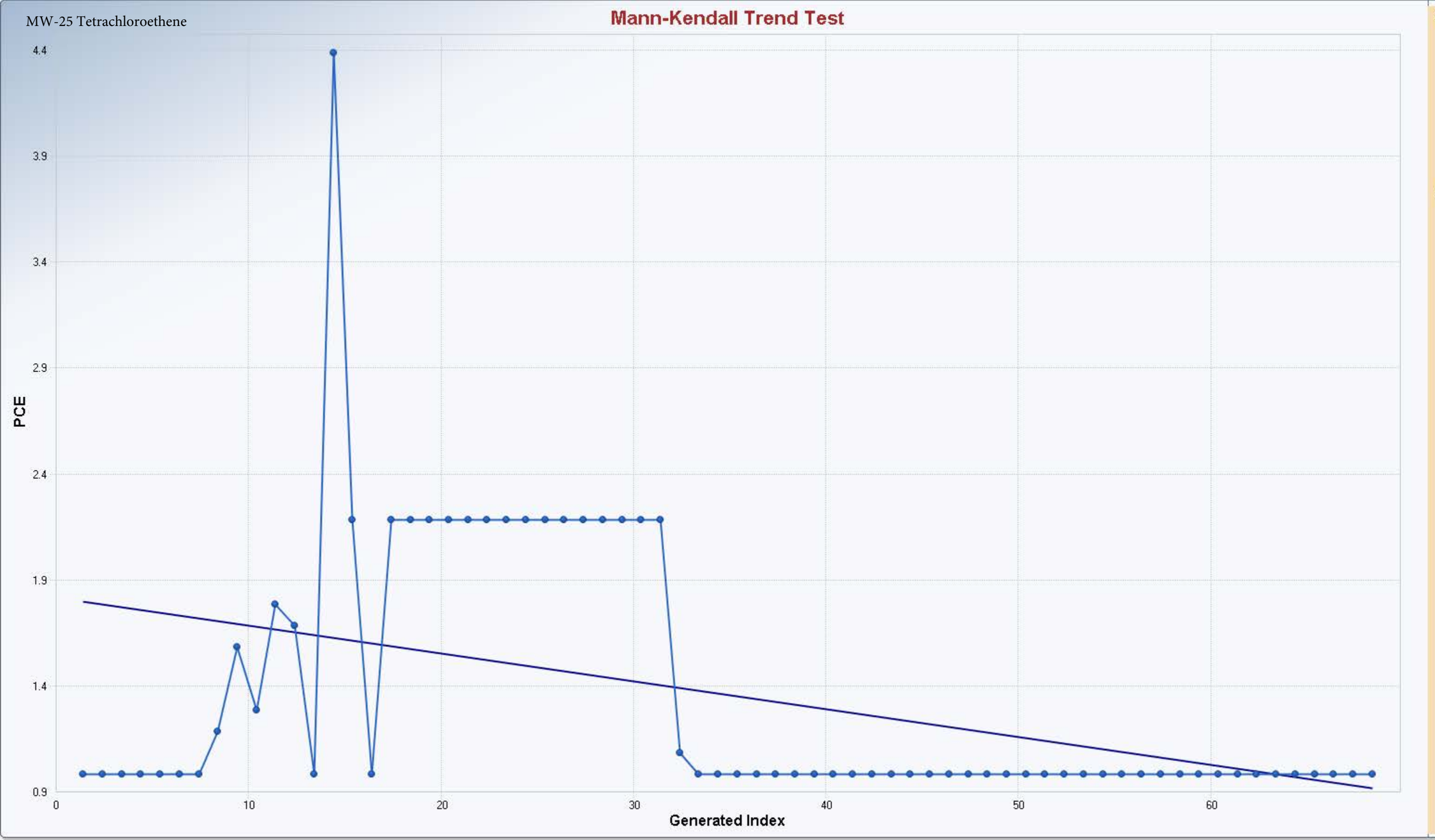
Number or Reported Events Not Used	0
Number of Generated Events	68
Number Values Reported (n)	70
Number Values Missing	2
Number Values Used	68
Minimum	0.14
Maximum	4.9
Mean	1.129
Geometric Mean	1.004
Median	1
Standard Deviation	0.7
Coefficient of Variation	0.62

Mann-Kendall Test

M-K Test Value (S)	-257
Critical Value (0.05)	-1.645
Standard Deviation of S	162.6
Standardized Value of S	-1.575
Approximate p-value	0.0577

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-25 Tetrachloroethene



Mann-Kendall Trend Analysis

n	68
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	157.3065
Standardized Value of S	-3.7570
M-K Test Value (S)	-592
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0132
OLS Regression Intercept	1.8262

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:25:52 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

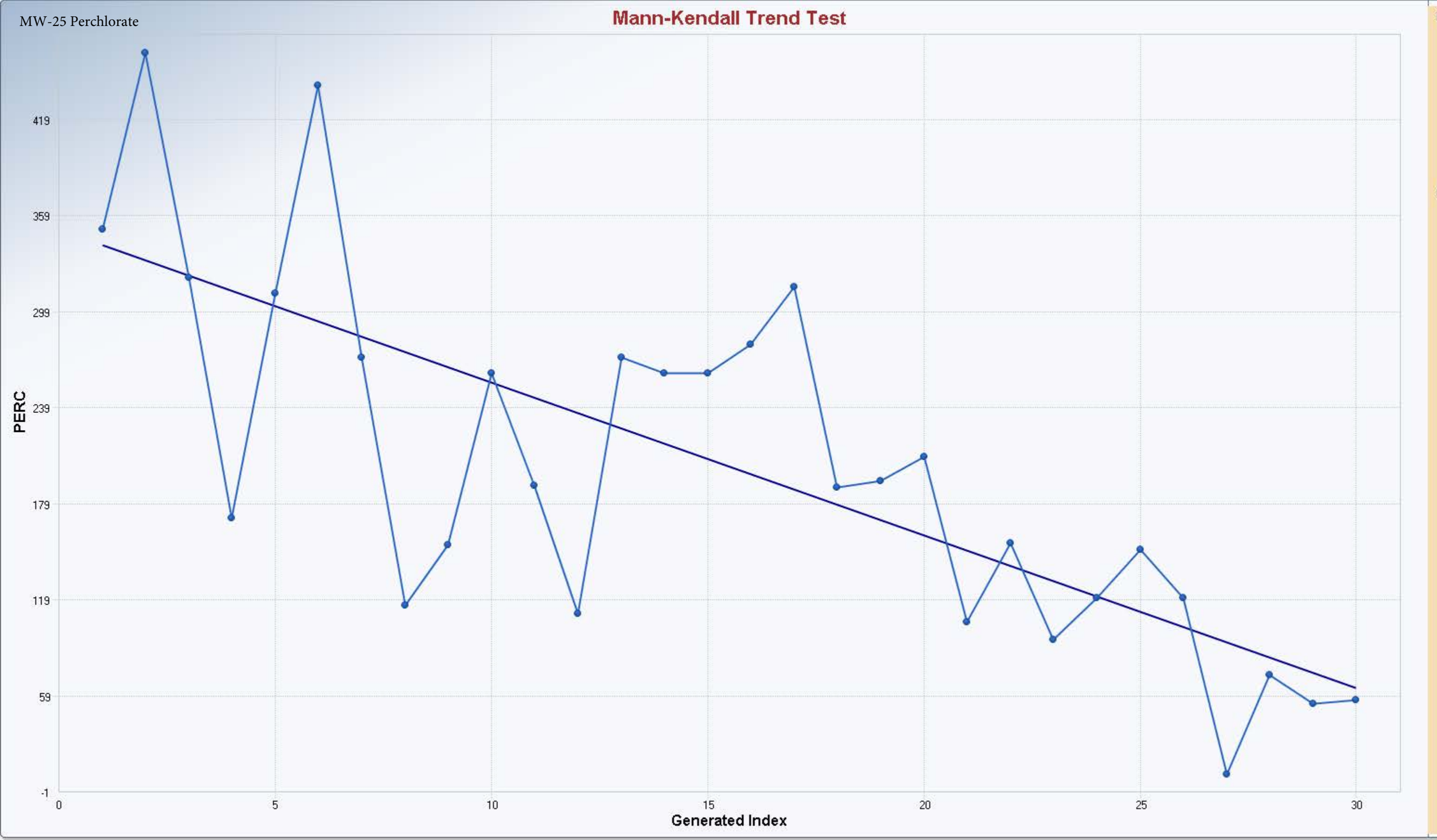
Number or Reported Events Not Used	0
Number of Generated Events	68
Number Values Reported (n)	70
Number Values Missing	2
Number Values Used	68
Minimum	1
Maximum	4.4
Mean	1.372
Geometric Mean	1.269
Median	1
Standard Deviation	0.633
Coefficient of Variation	0.461

Mann-Kendall Test

M-K Test Value (S)	-592
Critical Value (0.05)	-1.645
Standard Deviation of S	157.3
Standardized Value of S	-3.757
Approximate p-value	8.5982E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0000
Standardized Value of S	-4.4464
M-K Test Value (S)	-250
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-9.5452
OLS Regression Intercept	349.7867

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:21:38 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

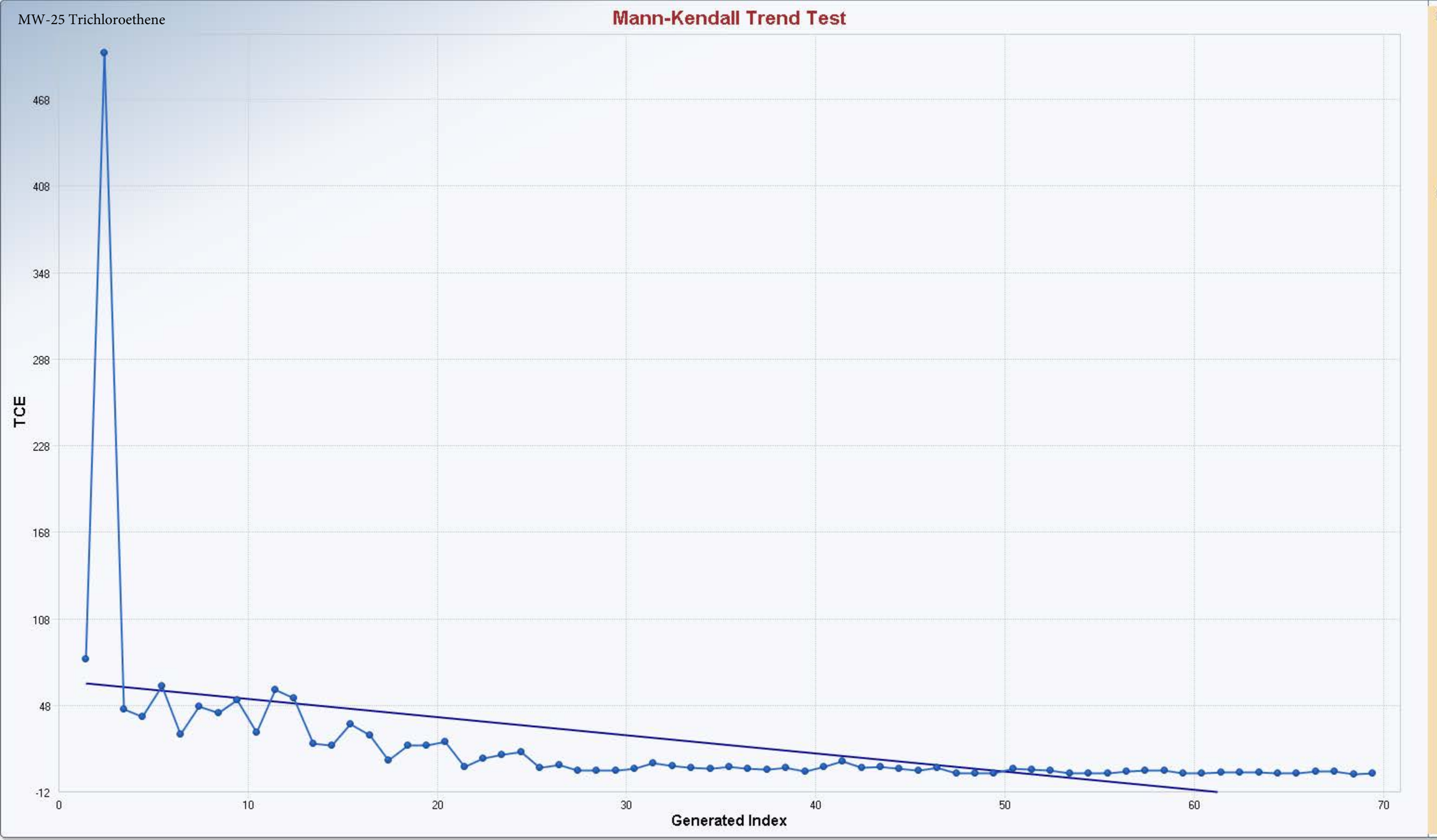
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	70
Number Values Missing	40
Number Values Used	30
Minimum	10
Maximum	460
Mean	201.8
Geometric Mean	163.8
Median	189.5
Standard Deviation	112.1
Coefficient of Variation	0.556

Mann-Kendall Test

M-K Test Value (S)	-250
Critical Value (0.05)	-1.645
Standard Deviation of S	56
Standardized Value of S	-4.446
Approximate p-value	4.3655E-6

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Trichloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.7338
Standardized Value of S	-8.8620
M-K Test Value (S)	-1,709
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.2680
OLS Regression Intercept	64.7000

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-25 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:18:46 AM	
From File	MW-25.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	70
Number Values Missing	1
Number Values Used	69
Minimum	0.5
Maximum	500
Mean	20.32
Geometric Mean	5.974
Median	4.6
Standard Deviation	61.3
Coefficient of Variation	3.017

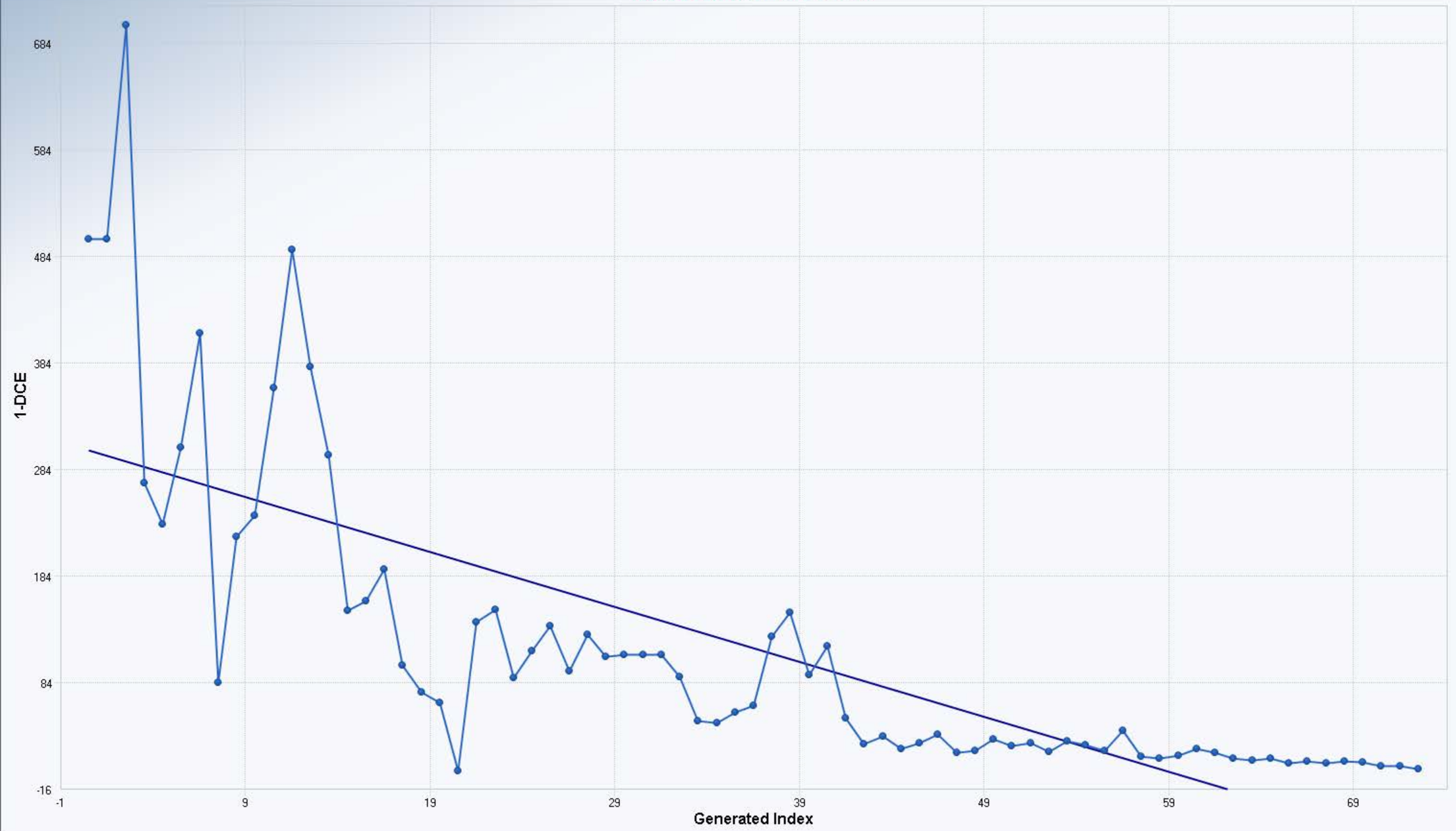
Mann-Kendall Test

M-K Test Value (S)	-1709
Critical Value (0.05)	-1.645
Standard Deviation of S	192.7
Standardized Value of S	-8.862
Approximate p-value	3.931E-19

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,1-Dichloroethene

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	209.9698
Standardized Value of S	-9.5776
M-K Test Value (S)	-2,012
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-5.1705
OLS Regression Intercept	306.6790

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:33:24 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	73
Minimum	1.1
Maximum	700
Mean	115.4
Geometric Mean	52.9
Median	62
Standard Deviation	143.2
Coefficient of Variation	1.242

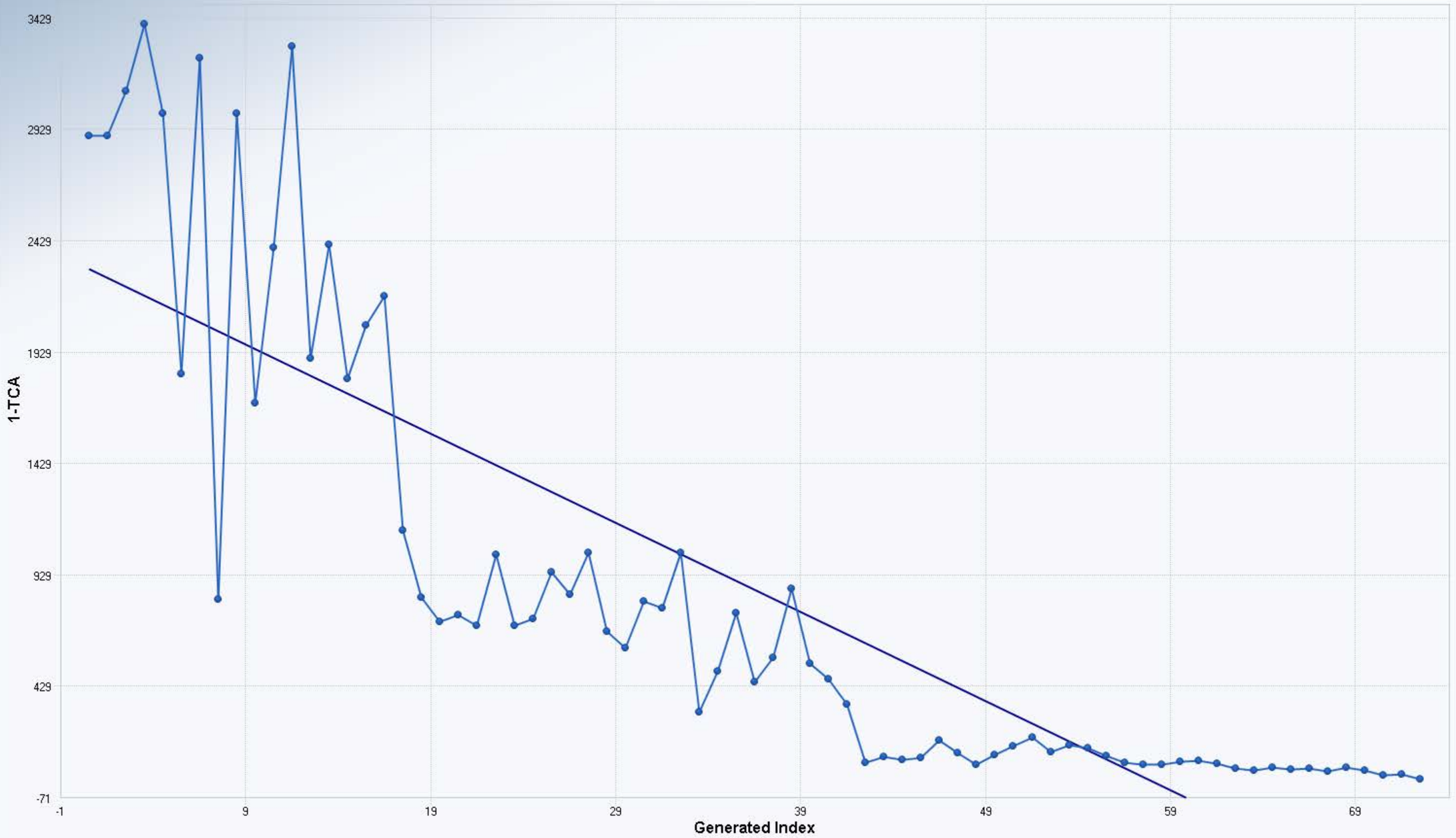
Mann-Kendall Test

M-K Test Value (S)	-2012
Critical Value (0.05)	-1.645
Standard Deviation of S	210
Standardized Value of S	-9.578
Approximate p-value	4.968E-22

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,1,1-Trichloroethane

Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	209.9714
Standardized Value of S	-10.1776
M-K Test Value (S)	-2,138
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-40.0170
OLS Regression Intercept	2,342.0763

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:28:51 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

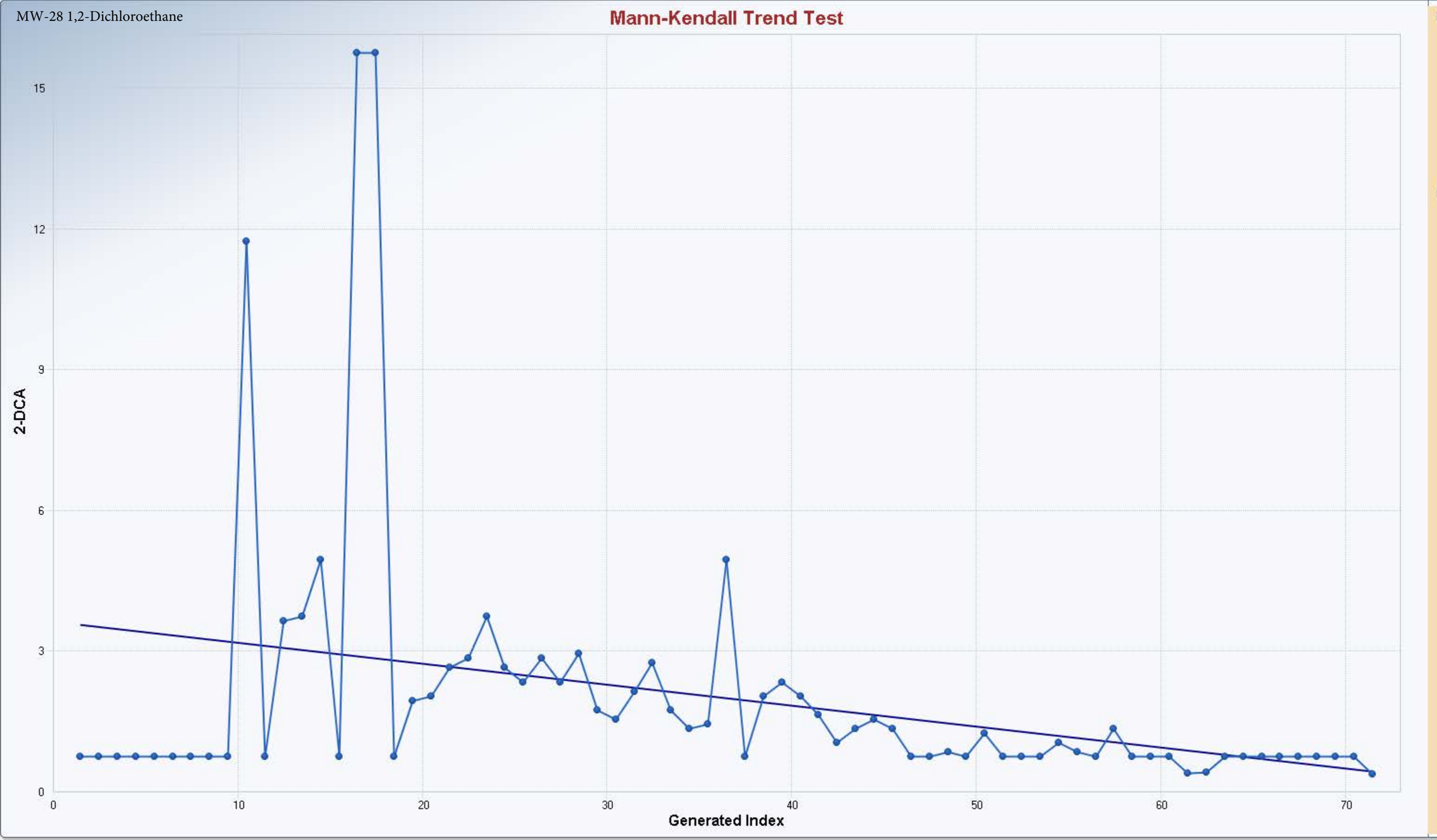
1-TCA

General Statistics	
Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	73
Minimum	14
Maximum	3400
Mean	861.4
Geometric Mean	369.3
Median	531
Standard Deviation	1001
Coefficient of Variation	1.161

Mann-Kendall Test	
M-K Test Value (S)	-2138
Critical Value (0.05)	-1.645
Standard Deviation of S	210
Standardized Value of S	-10.18
Approximate p-value	1.249E-24

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,2-Dichloroethane



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	192.6179
Standardized Value of S	-4.1429
M-K Test Value (S)	-799
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0447
OLS Regression Intercept	3.8708

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:35:04 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

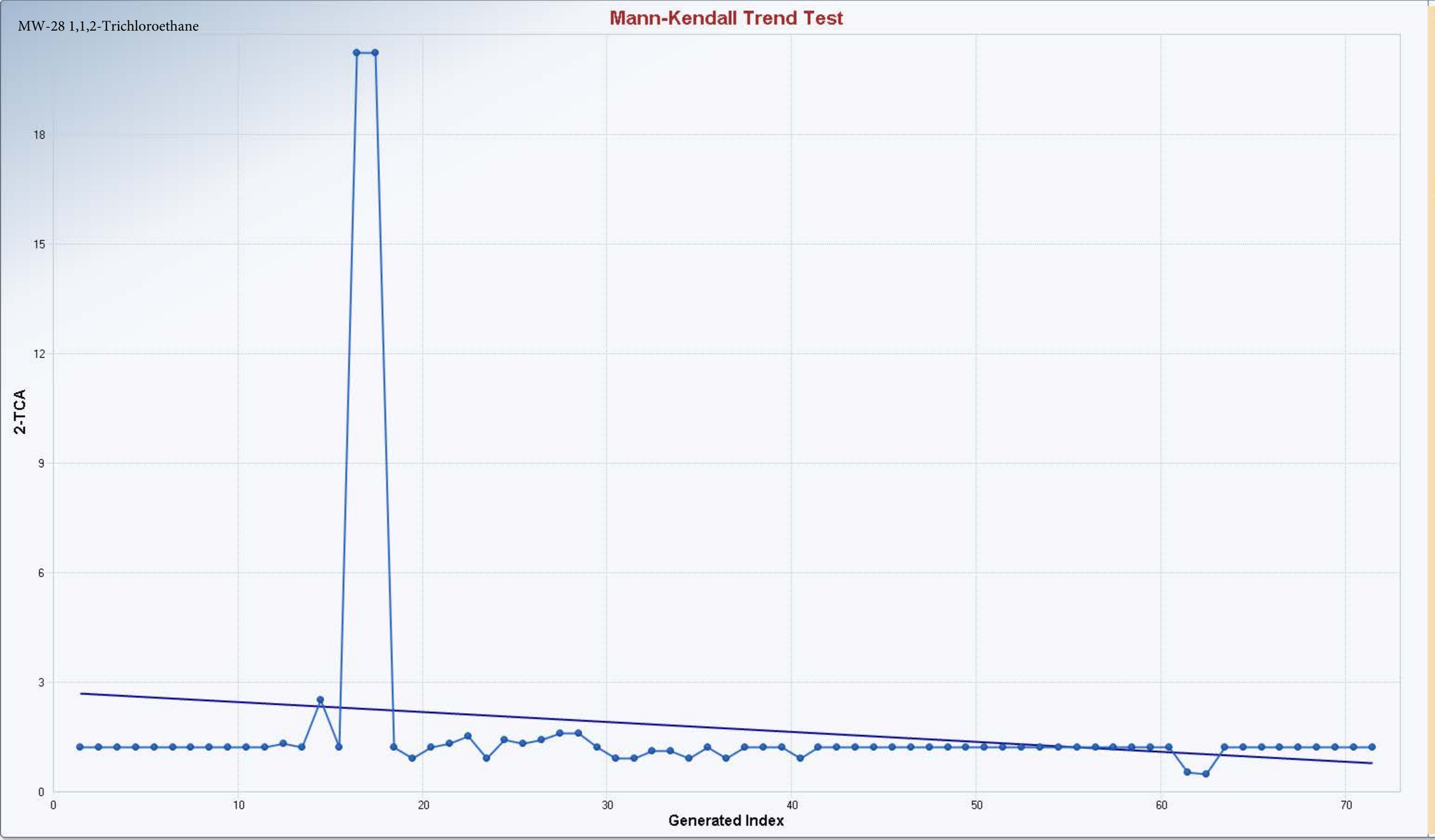
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	73
Number Values Missing	2
Number Values Used	71
Minimum	0.64
Maximum	16
Mean	2.263
Geometric Mean	1.628
Median	1.1
Standard Deviation	2.847
Coefficient of Variation	1.258

Mann-Kendall Test

M-K Test Value (S)	-799
Critical Value (0.05)	-1.645
Standard Deviation of S	192.6
Standardized Value of S	-4.143
Approximate p-value	1.7146E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 1,1,2-Trichloroethane



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	164.5529
Standardized Value of S	-1.5679
M-K Test Value (S)	-259
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0585

OLS Regression Line (Blue)

OLS Regression Slope	-0.0273
OLS Regression Intercept	2.5085

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-28 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:31:09 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

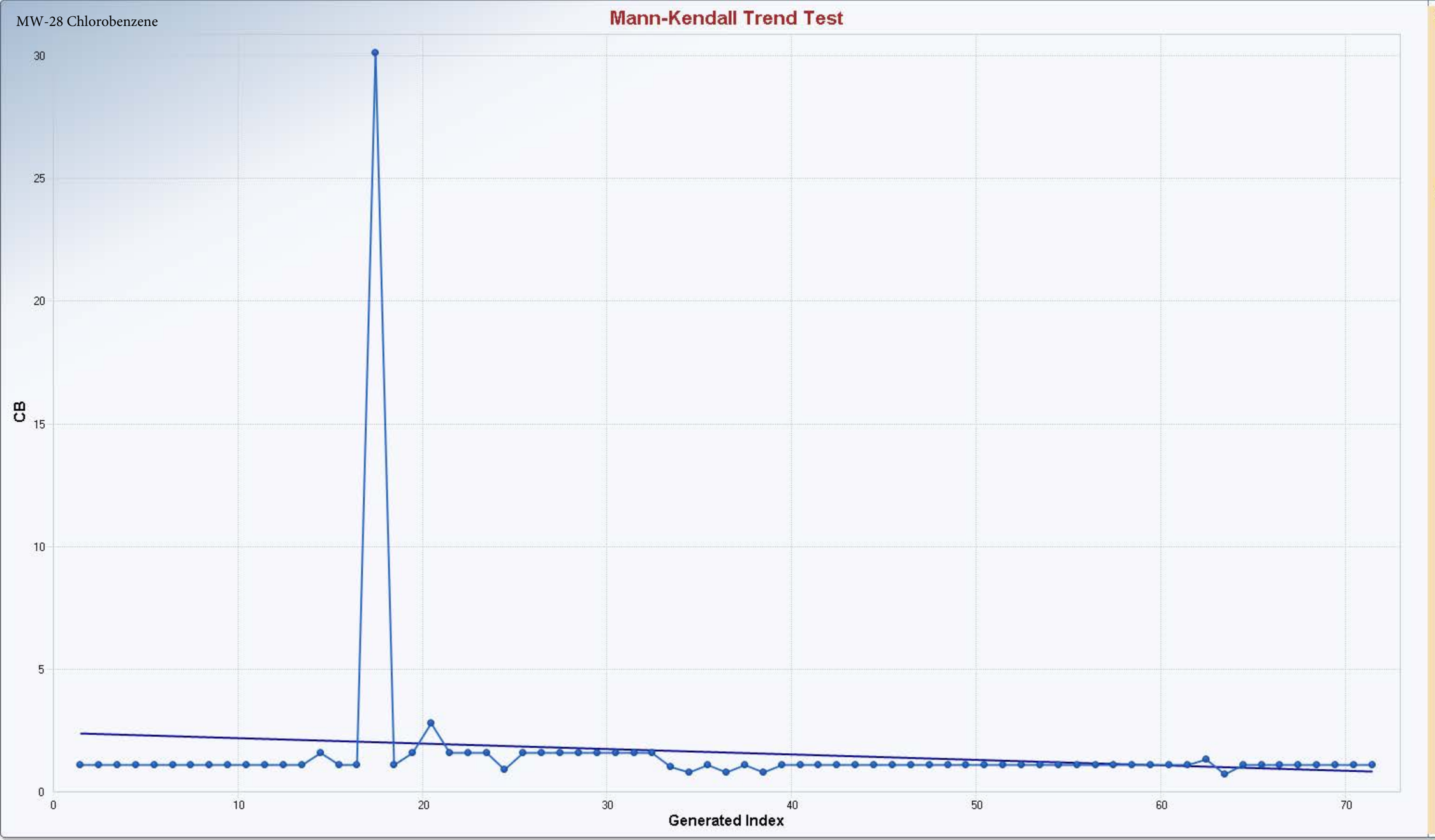
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	73
Number Values Missing	2
Number Values Used	71
Minimum	0.28
Maximum	20
Mean	1.527
Geometric Mean	1.048
Median	1
Standard Deviation	3.176
Coefficient of Variation	2.08

Mann-Kendall Test

M-K Test Value (S)	-259
Critical Value (0.05)	-1.645
Standard Deviation of S	164.6
Standardized Value of S	-1.568
Approximate p-value	0.0585

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-28 Chlorobenzene



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	163.8821
Standardized Value of S	-1.8245
M-K Test Value (S)	-300
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0340

OLS Regression Line (Blue)

OLS Regression Slope	-0.0218
OLS Regression Intercept	2.2901

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:36:32 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

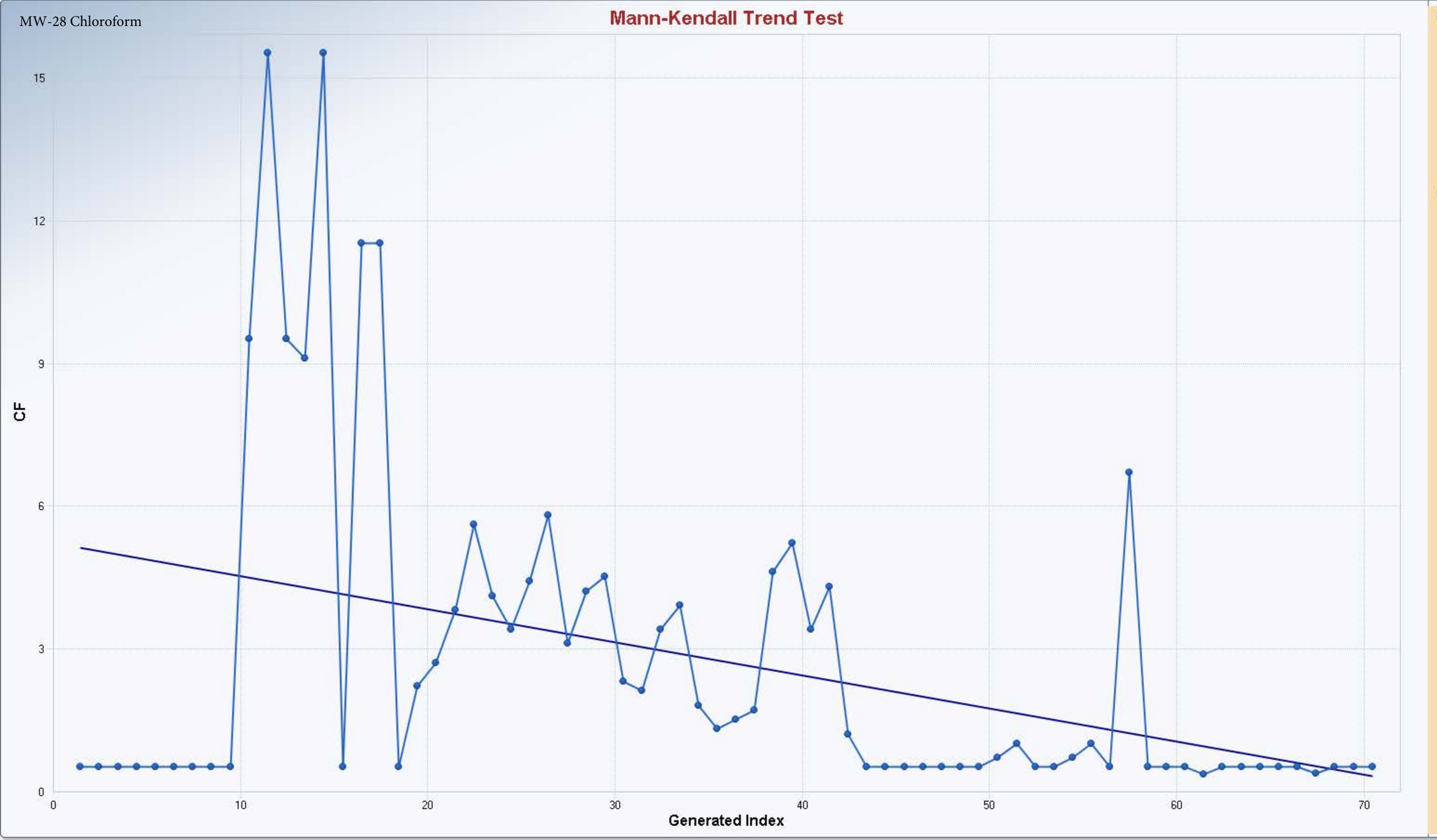
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	73
Number Values Missing	2
Number Values Used	71
Minimum	0.63
Maximum	30
Mean	1.505
Geometric Mean	1.119
Median	1
Standard Deviation	3.442
Coefficient of Variation	2.288

Mann-Kendall Test

M-K Test Value (S)	-300
Critical Value (0.05)	-1.645
Standard Deviation of S	163.9
Standardized Value of S	-1.824
Approximate p-value	0.034

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Chloroform



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	187.3419
Standardized Value of S	-3.8432
M-K Test Value (S)	-721
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0696
OLS Regression Intercept	5.6754

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:37:28 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CF

General Statistics

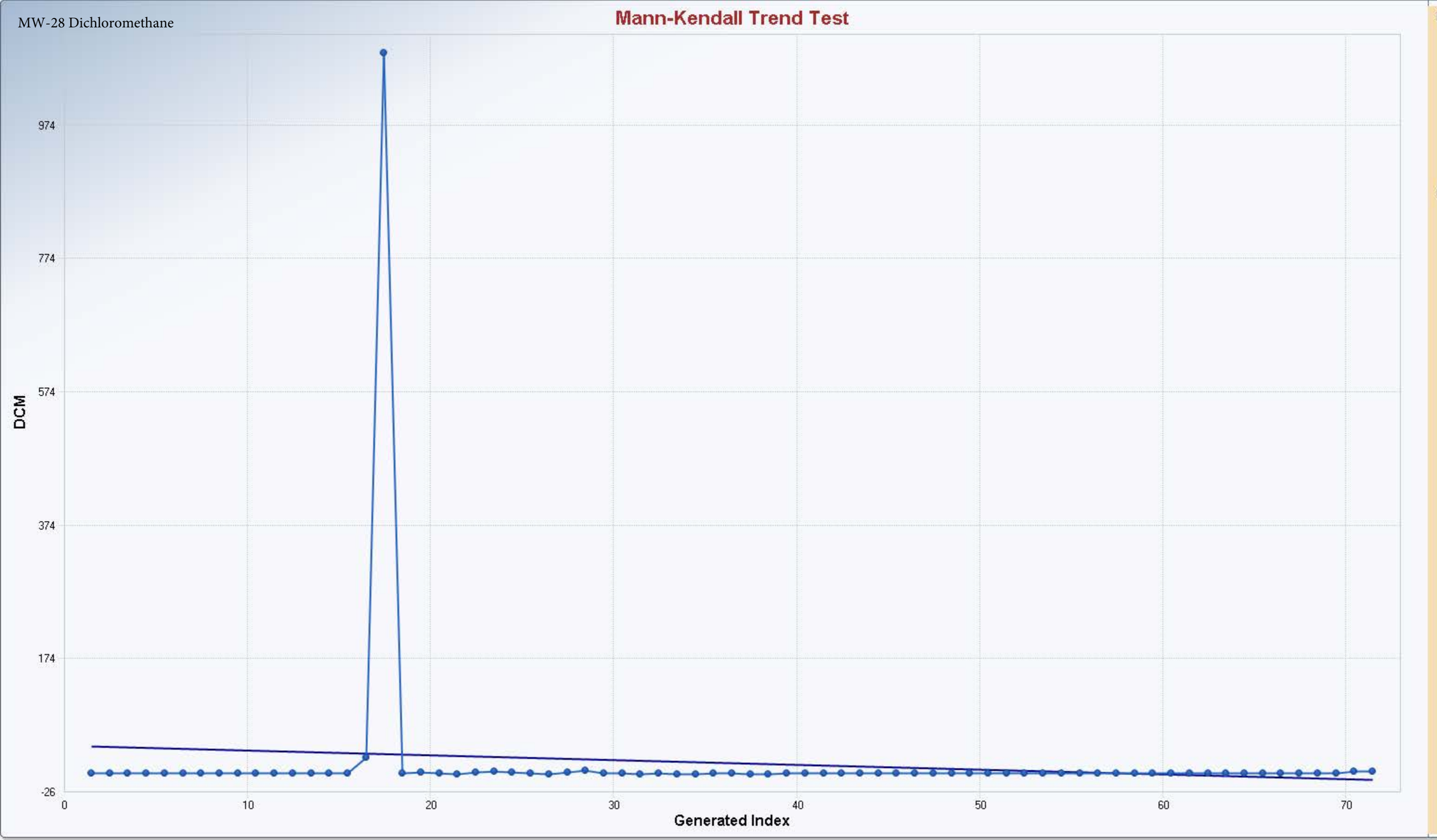
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	73
Number Values Missing	3
Number Values Used	70
Minimum	0.86
Maximum	16
Mean	3.206
Geometric Mean	2.072
Median	1.2
Standard Deviation	3.54
Coefficient of Variation	1.104

Mann-Kendall Test

M-K Test Value (S)	-721
Critical Value (0.05)	-1.645
Standard Deviation of S	187.3
Standardized Value of S	-3.843
Approximate p-value	6.0710E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Dichloromethane



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	182.1885
Standardized Value of S	-0.7849
M-K Test Value (S)	-144
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2163

OLS Regression Line (Blue)

OLS Regression Slope	-0.7019
OLS Regression Intercept	42.2146

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-28 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:38:44 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

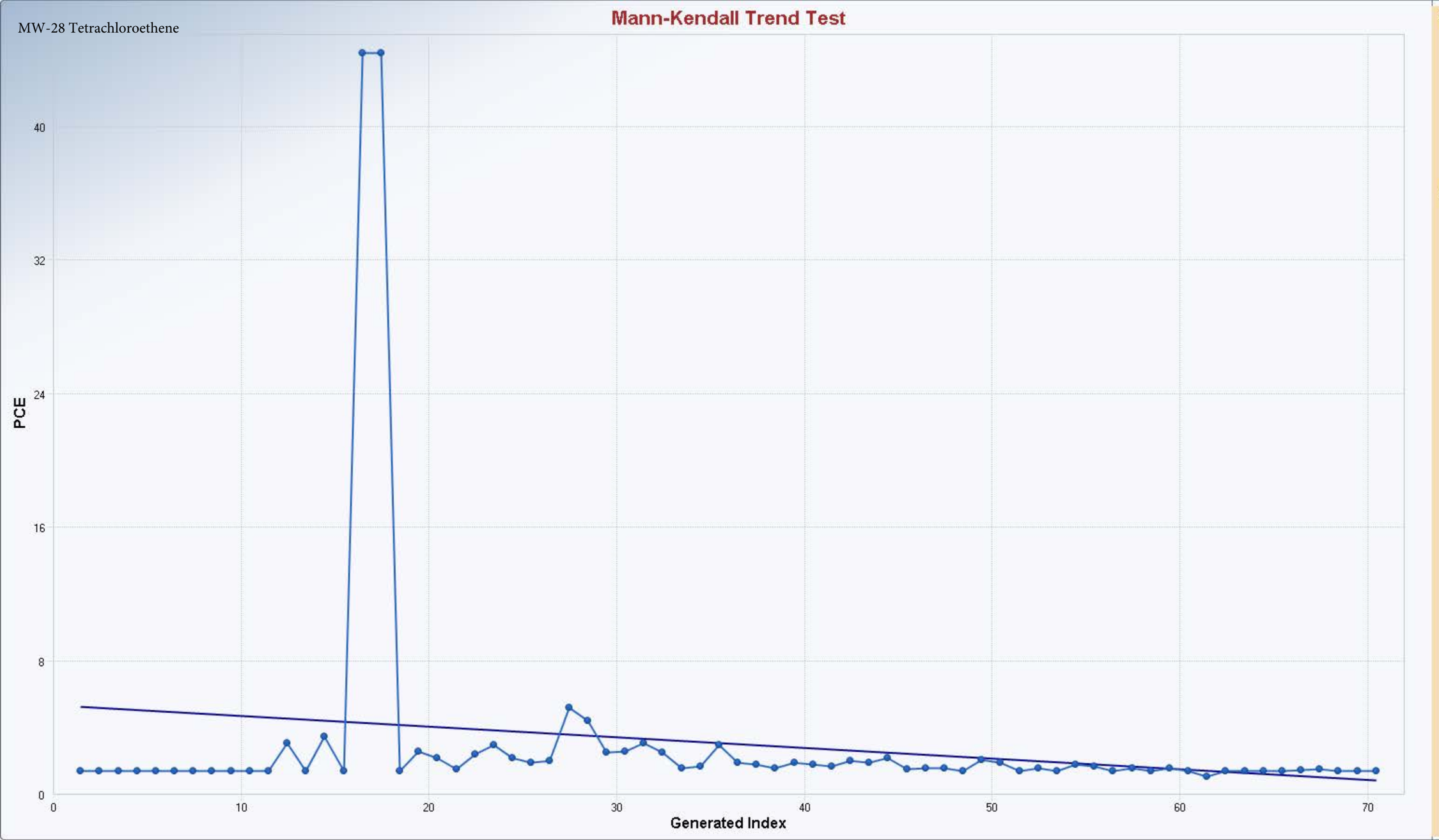
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	73
Number Values Missing	2
Number Values Used	71
Minimum	0.7
Maximum	1081
Mean	16.95
Geometric Mean	1.4
Median	1
Standard Deviation	128.1
Coefficient of Variation	7.561

Mann-Kendall Test

M-K Test Value (S)	-144
Critical Value (0.05)	-1.645
Standard Deviation of S	182.2
Standardized Value of S	-0.785
Approximate p-value	0.216

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-28 Tetrachloroethene



Mann-Kendall Trend Analysis

n	70
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	191.7577
Standardized Value of S	-1.9504
M-K Test Value (S)	-375
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0256

OLS Regression Line (Blue)

OLS Regression Slope	-0.0637
OLS Regression Intercept	4.9405

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:41:49 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

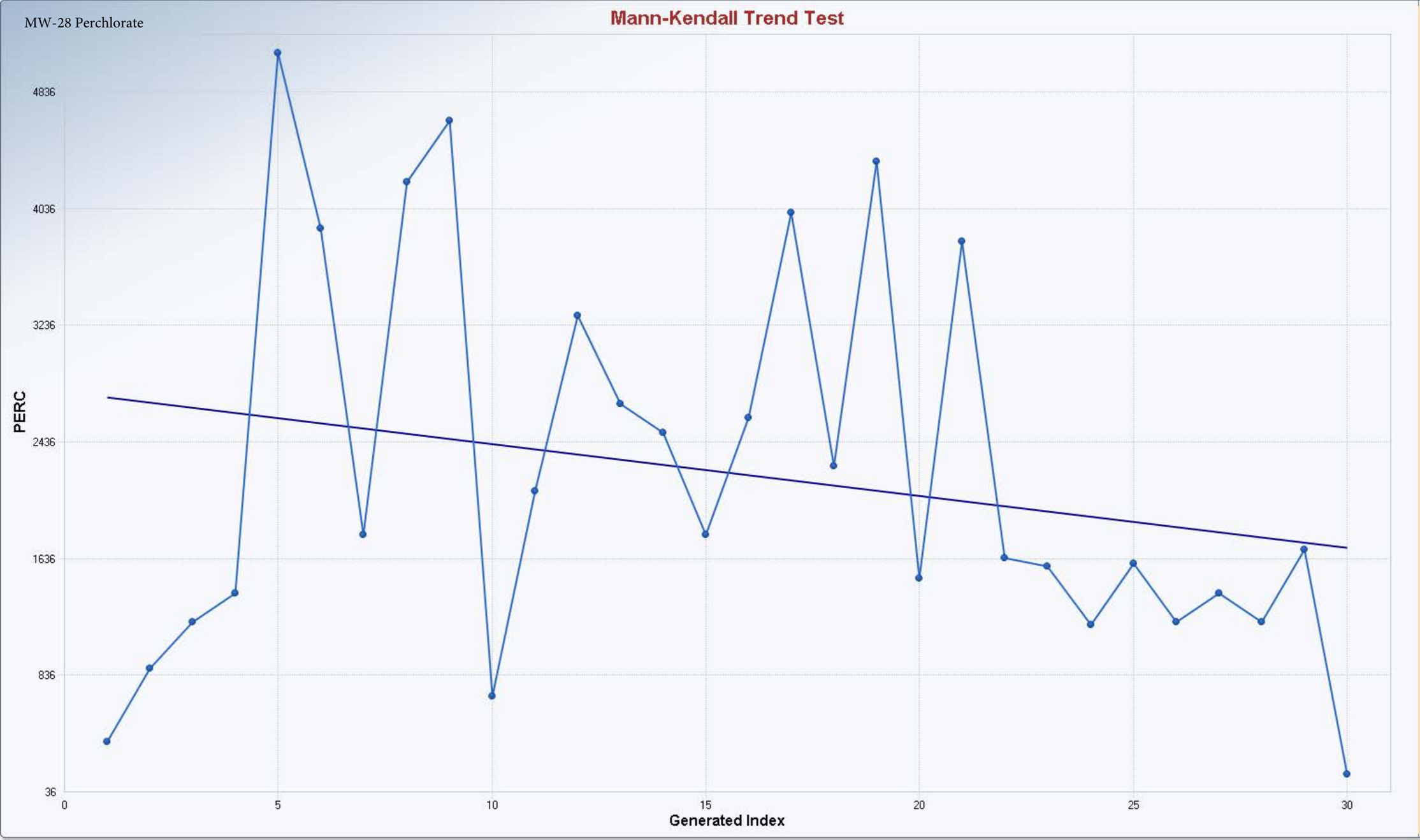
Number or Reported Events Not Used	0
Number of Generated Events	70
Number Values Reported (n)	73
Number Values Missing	3
Number Values Used	70
Minimum	0.7
Maximum	44
Mean	2.679
Geometric Mean	1.485
Median	1.2
Standard Deviation	7.174
Coefficient of Variation	2.678

Mann-Kendall Test

M-K Test Value (S)	-375
Critical Value (0.05)	-1.645
Standard Deviation of S	191.8
Standardized Value of S	-1.95
Approximate p-value	0.0256

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0000
Standardized Value of S	-1.2679
M-K Test Value (S)	-72
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1024

OLS Regression Line (Blue)

OLS Regression Slope	-35.4750
OLS Regression Intercept	2,777.1954

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-28 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:27:47 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

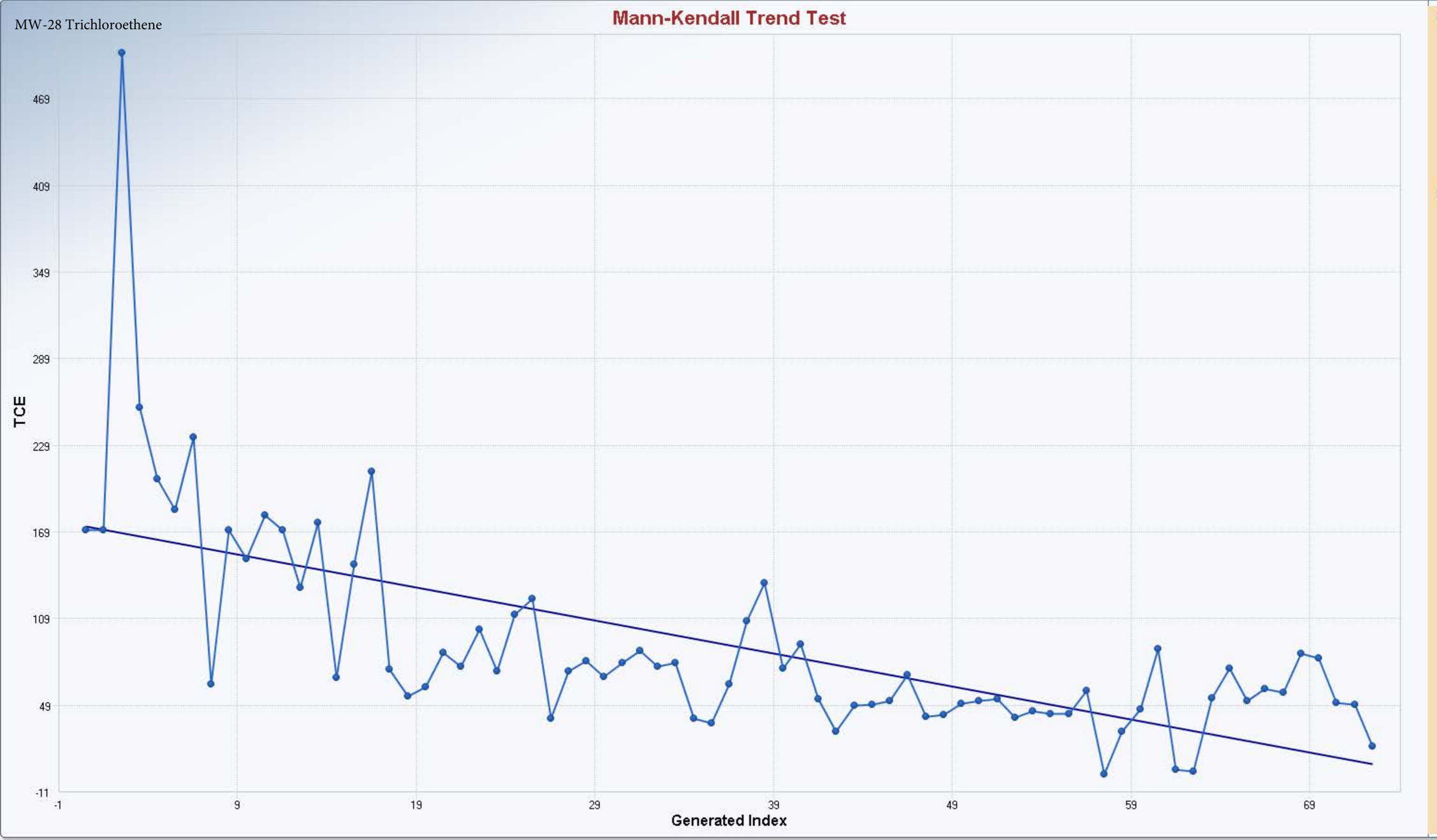
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	73
Number Values Missing	43
Number Values Used	30
Minimum	160
Maximum	5100
Mean	2227
Geometric Mean	1786
Median	1750
Standard Deviation	1346
Coefficient of Variation	0.604

Mann-Kendall Test

M-K Test Value (S)	-72
Critical Value (0.05)	-1.645
Standard Deviation of S	56
Standardized Value of S	-1.268
Approximate p-value	0.102

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-28 Trichloroethene



Mann-Kendall Trend Analysis

n	73
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	209.9436
Standardized Value of S	-6.2493
M-K Test Value (S)	-1,313
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.2905
OLS Regression Intercept	174.7609

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:42:43 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

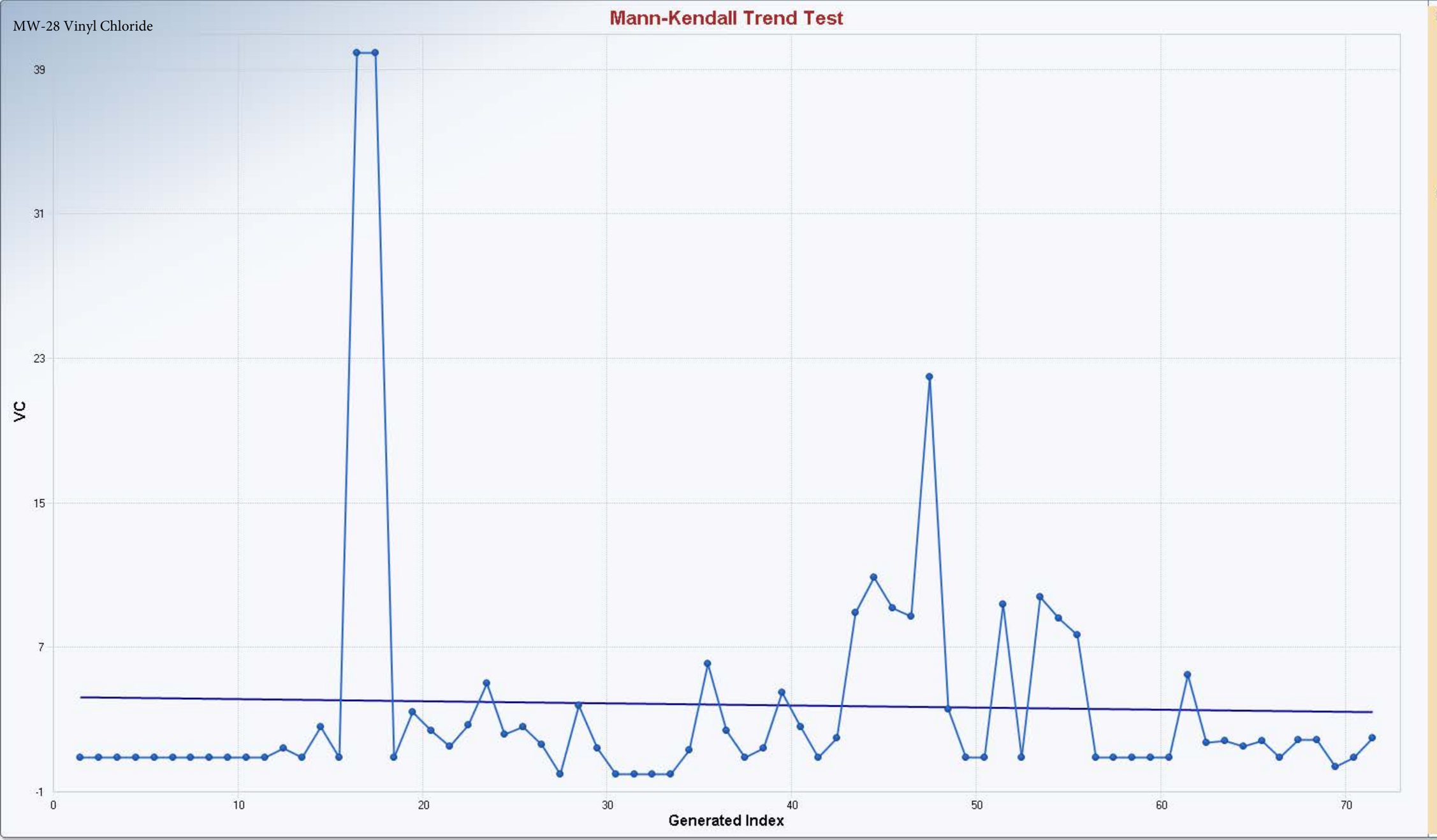
Number or Reported Events Not Used	0
Number of Generated Events	73
Number Values Reported (n)	73
Minimum	1
Maximum	500
Mean	90.01
Geometric Mean	66.36
Median	69.7
Standard Deviation	73.75
Coefficient of Variation	0.819

Mann-Kendall Test

M-K Test Value (S)	-1313
Critical Value (0.05)	-1.645
Standard Deviation of S	209.9
Standardized Value of S	-6.249
Approximate p-value	2.062E-10

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-28 Vinyl Chloride



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	196.2167
Standardized Value of S	1.5085
M-K Test Value (S)	297
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0657

OLS Regression Line (Blue)

OLS Regression Slope	-0.0120
OLS Regression Intercept	4.3569

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-28 Vinyl Chloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:43:29 AM	
From File	MW-28.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

VC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	73
Number Values Missing	2
Number Values Used	71
Minimum	0.1
Maximum	40
Mean	3.924
Geometric Mean	1.785
Median	1.5
Standard Deviation	7.134
Coefficient of Variation	1.818

Mann-Kendall Test

M-K Test Value (S)	297
Critical Value (0.05)	1.645
Standard Deviation of S	196.2
Standardized Value of S	1.509
Approximate p-value	0.0657

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-29 1,1-Dichloroethene

Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.4365
Standardized Value of S	-6.5083
M-K Test Value (S)	-1,312
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.5592
OLS Regression Intercept	204.4095

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 1,1-Dichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:57:50 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-DCE

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	1
Maximum	1000
Mean	76.28
Geometric Mean	28.29
Median	33.3
Standard Deviation	159.9
Coefficient of Variation	2.097

Mann-Kendall Test

M-K Test Value (S)	-1312
Critical Value (0.05)	-1.645
Standard Deviation of S	201.4
Standardized Value of S	-6.508
Approximate p-value	3.801E-11

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 1,1,1-Trichloroethane

Mann-Kendall Trend Test

Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.4398
Standardized Value of S	-10.3306
M-K Test Value (S)	-2,082
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-30.4404
OLS Regression Intercept	1,623.9921

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 1,1,1-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:53:43 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

1-TCA

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	8
Maximum	7020
Mean	528.1
Geometric Mean	131.2
Median	162
Standard Deviation	1109
Coefficient of Variation	2.099

Mann-Kendall Test

M-K Test Value (S)	-2082
Critical Value (0.05)	-1.645
Standard Deviation of S	201.4
Standardized Value of S	-10.33
Approximate p-value	2.561E-25

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 1,2-Dichloroethane

Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	165.3592
Standardized Value of S	1.1732
M-K Test Value (S)	195
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1204

OLS Regression Line (Blue)

OLS Regression Slope	-0.0179
OLS Regression Intercept	1.8672

Insufficient statistical evidence of a significant trend at the specified level of significance.

MW-29 1,2-Dichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:01:02 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-DCA

General Statistics

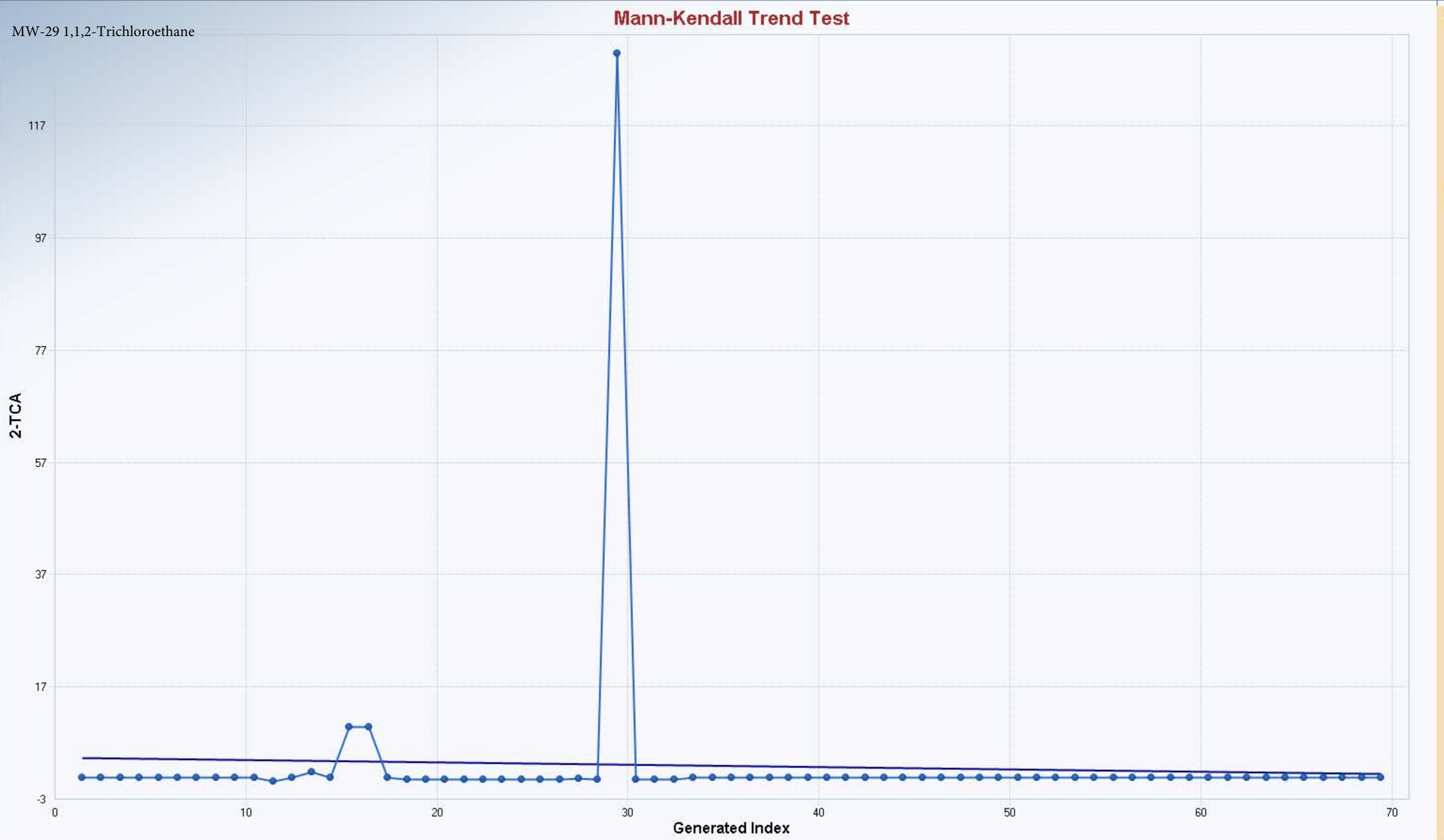
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.5
Maximum	11
Mean	1.242
Geometric Mean	0.947
Median	1
Standard Deviation	1.709
Coefficient of Variation	1.376

Mann-Kendall Test

M-K Test Value (S)	195
Critical Value (0.05)	1.645
Standard Deviation of S	165.4
Standardized Value of S	1.173
Approximate p-value	0.12

Insufficient evidence to identify a significant trend at the specified level of significance.

MW-29 1,1,2-Trichloroethane



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	150.7116
Standardized Value of S	1.6920
M-K Test Value (S)	256
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0453

OLS Regression Line (Blue)

OLS Regression Slope	-0.0398
OLS Regression Intercept	4.4709

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-29 1,1,2-Trichloroethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:56:20 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

2-TCA

General Statistics

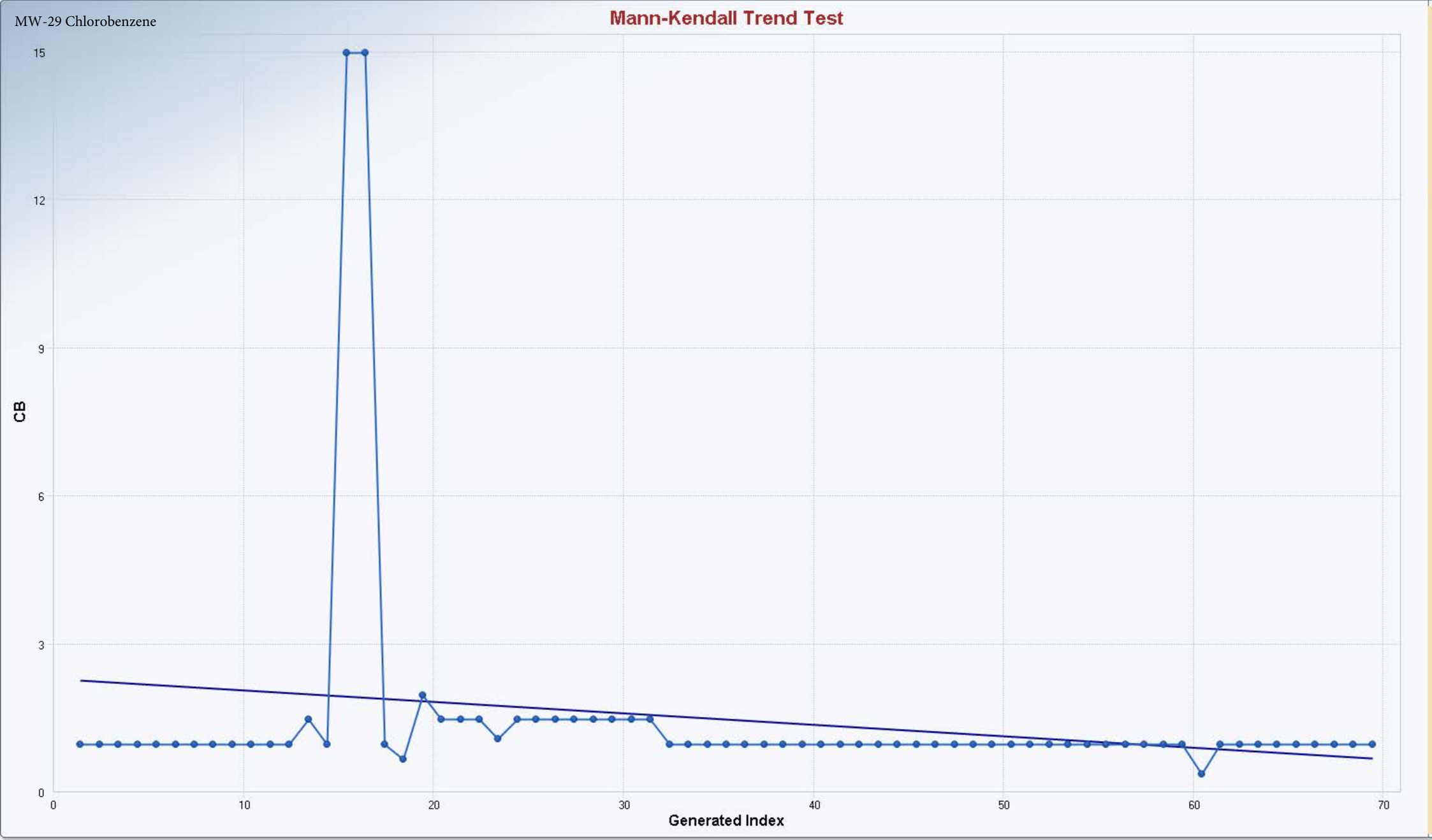
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.4
Maximum	130
Mean	3.077
Geometric Mean	1.066
Median	1
Standard Deviation	15.58
Coefficient of Variation	5.064

Mann-Kendall Test

M-K Test Value (S)	256
Critical Value (0.05)	1.645
Standard Deviation of S	150.7
Standardized Value of S	1.692
Approximate p-value	0.0453

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-29 Chlorobenzene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	147.9977
Standardized Value of S	-2.8582
M-K Test Value (S)	-424
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0021

OLS Regression Line (Blue)

OLS Regression Slope	-0.0232
OLS Regression Intercept	2.3078

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Chlorobenzene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:02:44 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CB

General Statistics

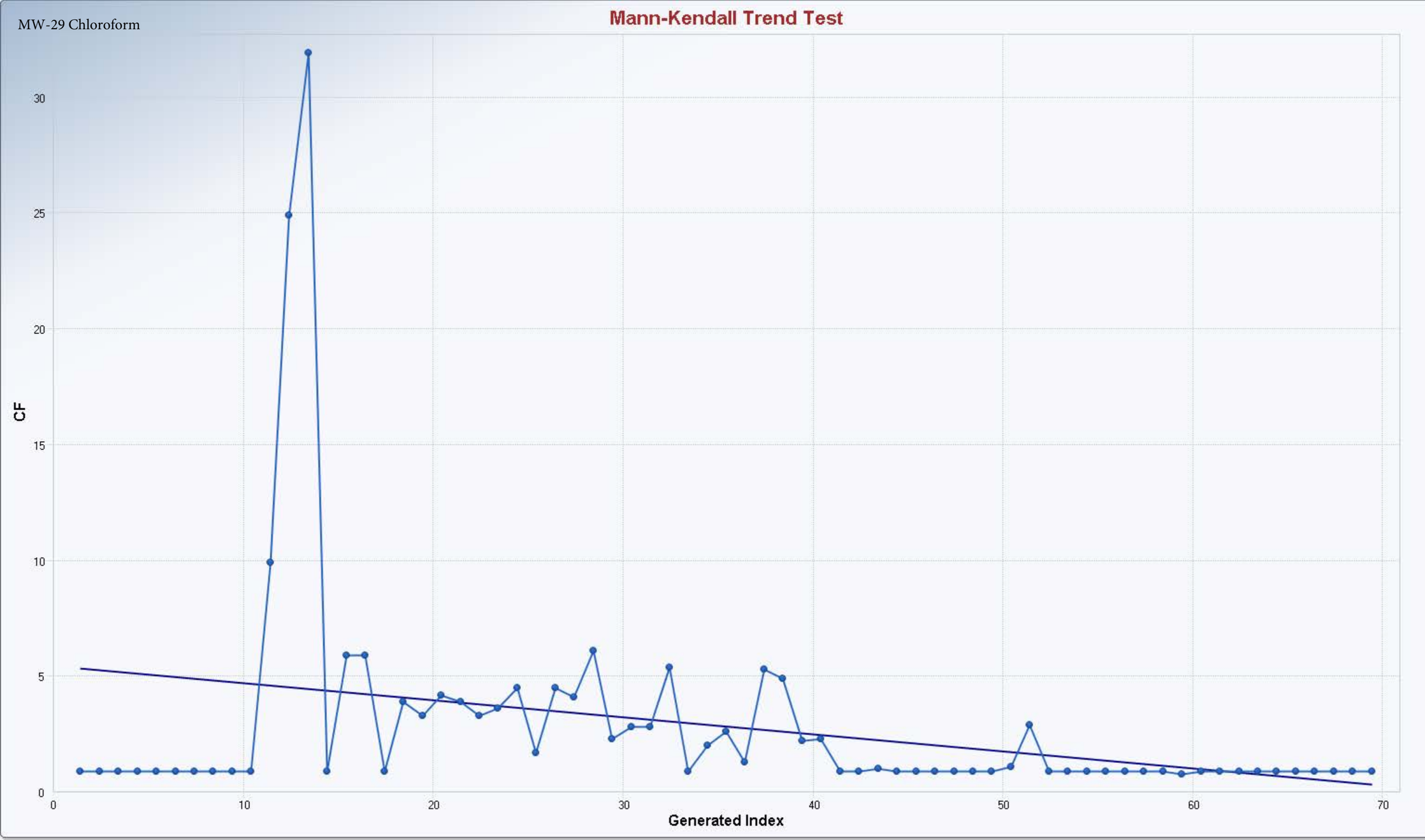
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.4
Maximum	15
Mean	1.496
Geometric Mean	1.153
Median	1
Standard Deviation	2.362
Coefficient of Variation	1.58

Mann-Kendall Test

M-K Test Value (S)	-424
Critical Value (0.05)	-1.645
Standard Deviation of S	148
Standardized Value of S	-2.858
Approximate p-value	0.00213

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Chloroform



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	175.9043
Standardized Value of S	-3.5929
M-K Test Value (S)	-633
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	-0.0733
OLS Regression Intercept	5.4972

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Chloroform	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:07:11 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

CF

General Statistics

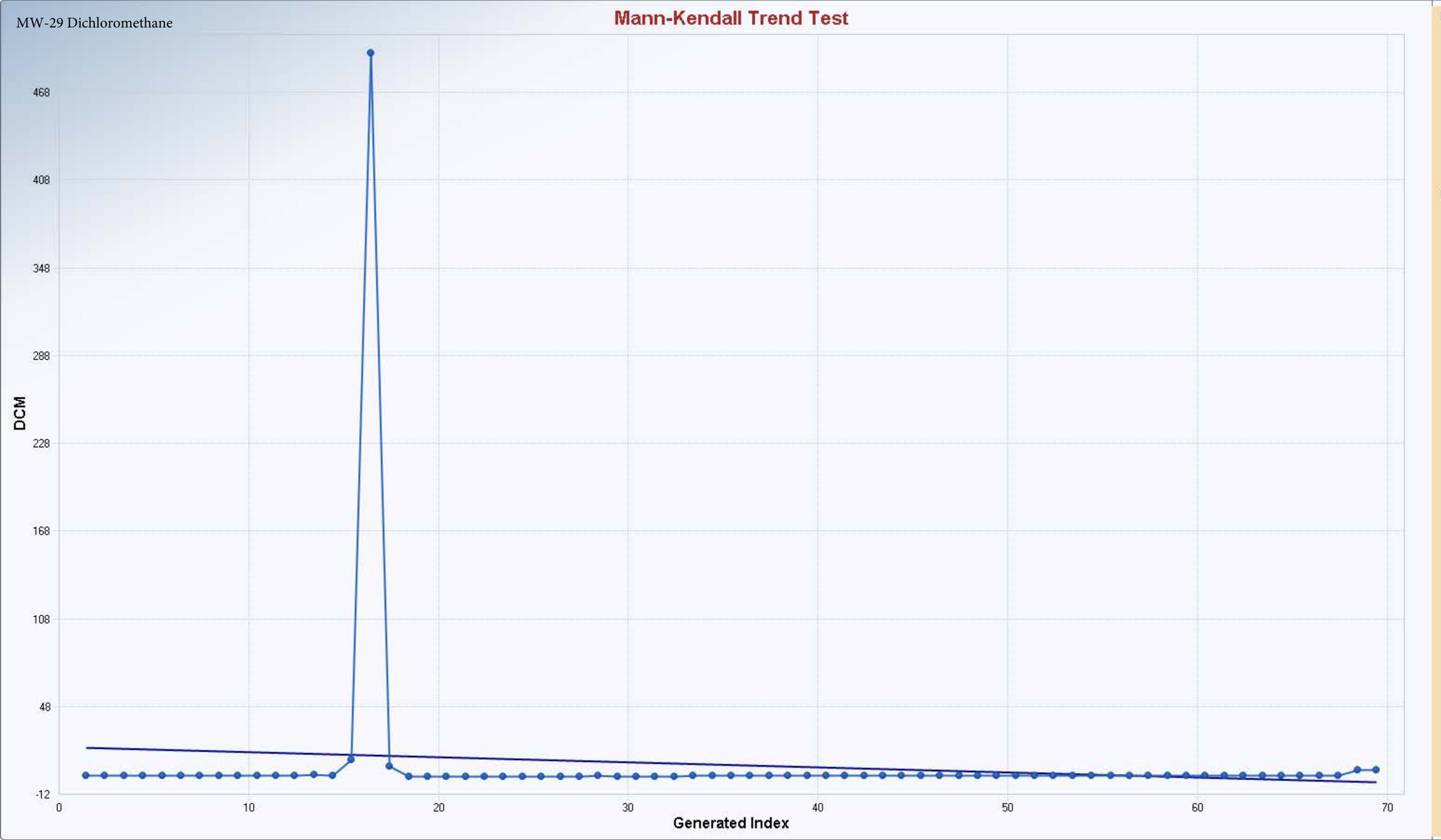
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.89
Maximum	32
Mean	2.933
Geometric Mean	1.799
Median	1
Standard Deviation	4.848
Coefficient of Variation	1.653

Mann-Kendall Test

M-K Test Value (S)	-633
Critical Value (0.05)	-1.645
Standard Deviation of S	175.9
Standardized Value of S	-3.593
Approximate p-value	1.6353E-4

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Dichloromethane



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	155.8268
Standardized Value of S	1.8803
M-K Test Value (S)	294
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0300

OLS Regression Line (Blue)

OLS Regression Slope	-0.3442
OLS Regression Intercept	20.5168

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-29 Dichloromethane	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:08:35 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

DCM

General Statistics

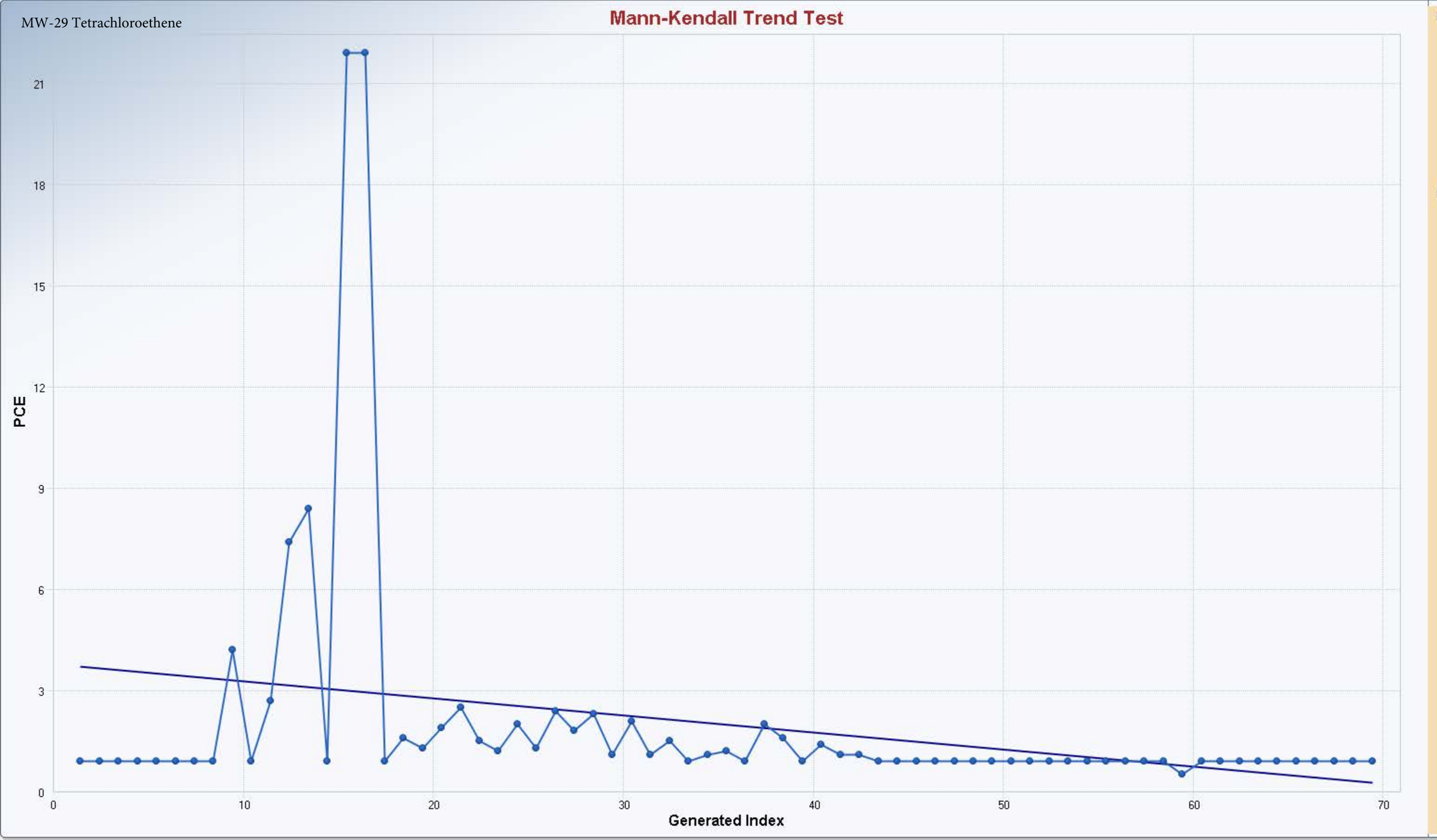
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.7
Maximum	495
Mean	8.47
Geometric Mean	1.142
Median	1
Standard Deviation	59.46
Coefficient of Variation	7.02

Mann-Kendall Test

M-K Test Value (S)	294
Critical Value (0.05)	1.645
Standard Deviation of S	155.8
Standardized Value of S	1.88
Approximate p-value	0.03

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-29 Tetrachloroethene



Mann-Kendall Trend Analysis

n	69
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	172.8757
Standardized Value of S	-4.1938
M-K Test Value (S)	-726
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0506
OLS Regression Intercept	3.8739

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Tetrachloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:10:28 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PCE

General Statistics

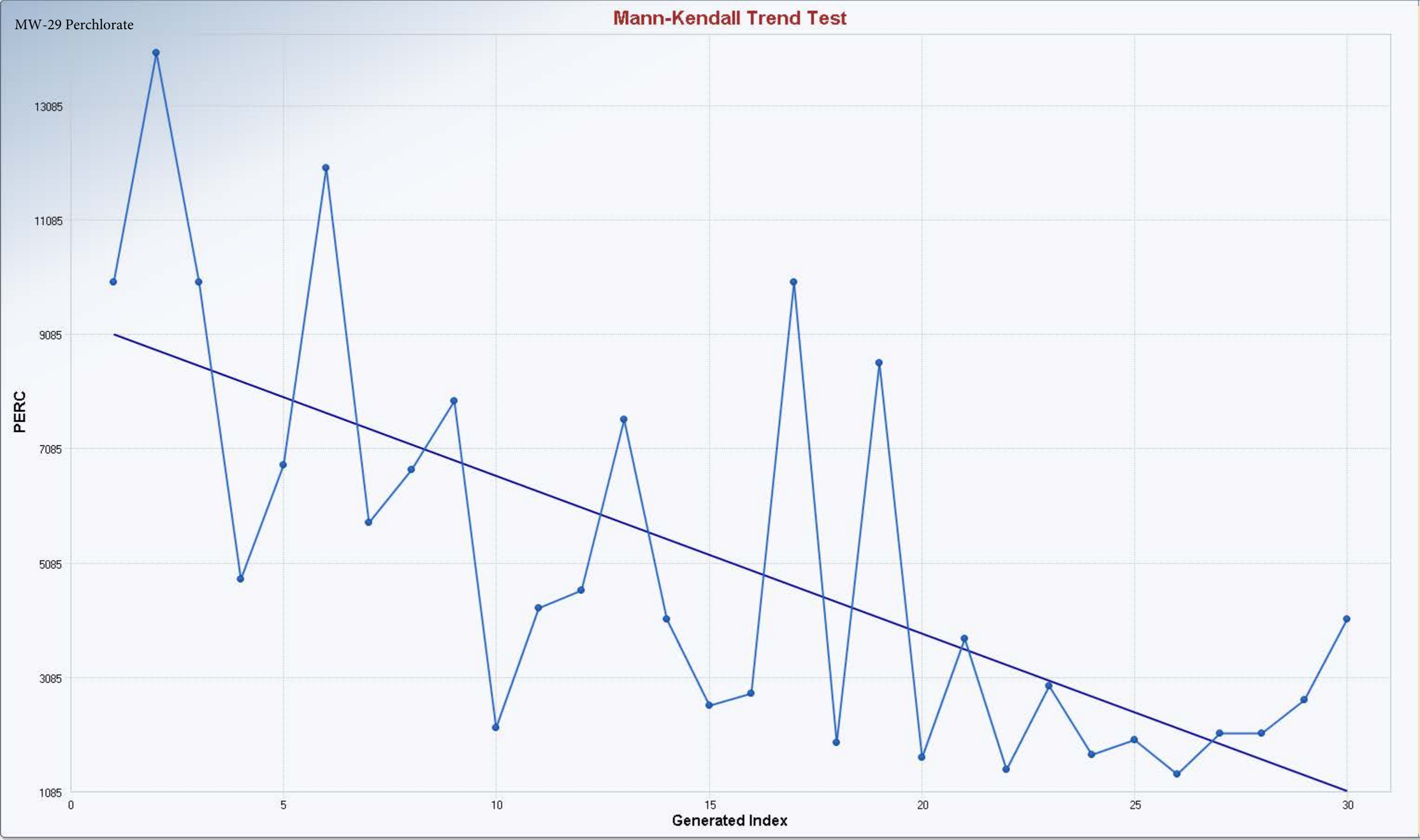
Number or Reported Events Not Used	0
Number of Generated Events	69
Number Values Reported (n)	71
Number Values Missing	2
Number Values Used	69
Minimum	0.63
Maximum	22
Mean	2.102
Geometric Mean	1.4
Median	1
Standard Deviation	3.69
Coefficient of Variation	1.756

Mann-Kendall Test

M-K Test Value (S)	-726
Critical Value (0.05)	-1.645
Standard Deviation of S	172.9
Standardized Value of S	-4.194
Approximate p-value	1.3718E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Perchlorate



Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0000
Standardized Value of S	-3.9107
M-K Test Value (S)	-220
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-275.3326
OLS Regression Intercept	9,360.3218

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Perchlorate	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 10:52:25 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

PERC

General Statistics

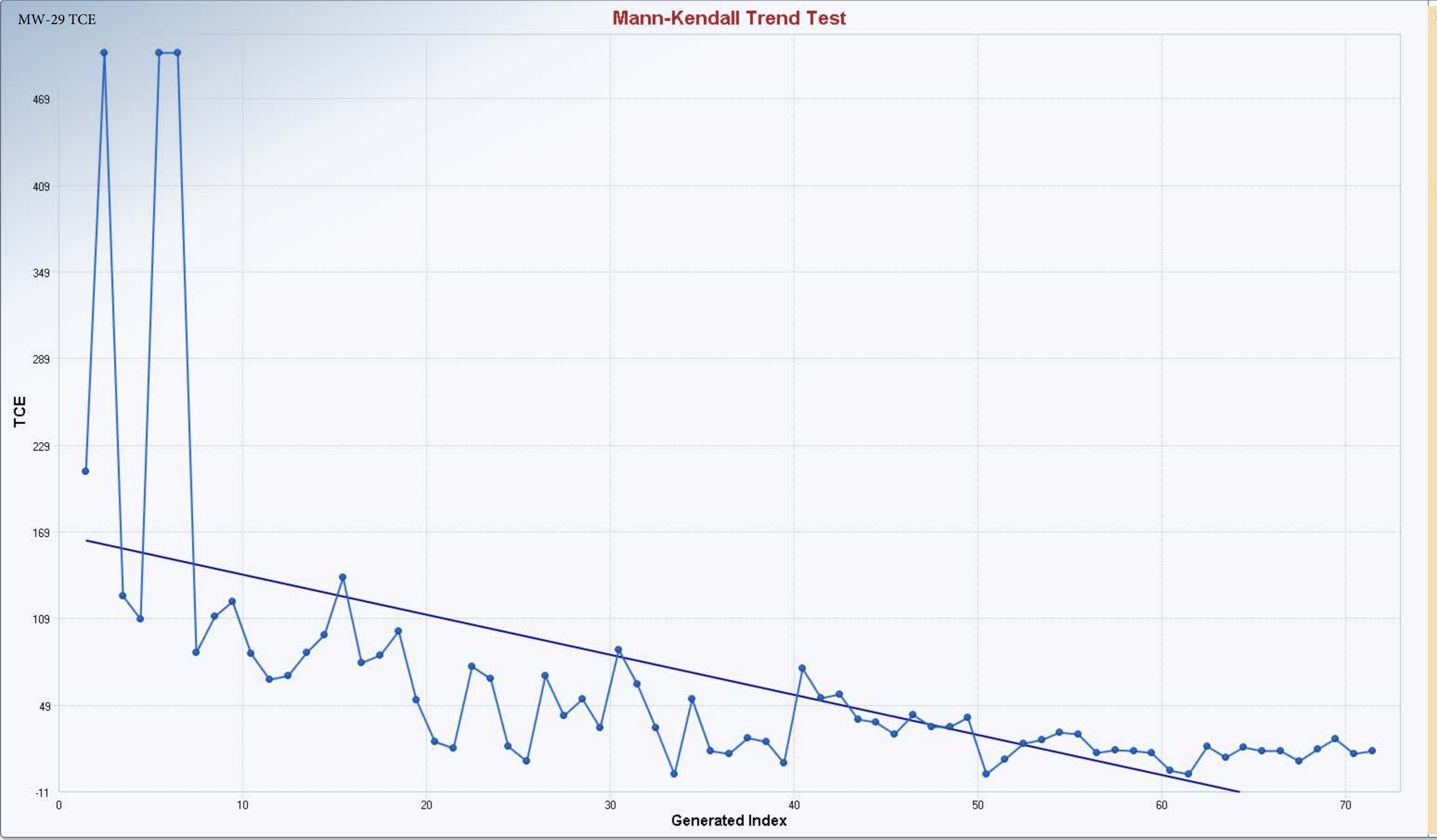
Number or Reported Events Not Used	0
Number of Generated Events	30
Number Values Reported (n)	71
Number Values Missing	41
Number Values Used	30
Minimum	1400
Maximum	14000
Mean	5093
Geometric Mean	4062
Median	4100
Standard Deviation	3492
Coefficient of Variation	0.686

Mann-Kendall Test

M-K Test Value (S)	-220
Critical Value (0.05)	-1.645
Standard Deviation of S	56
Standardized Value of S	-3.911
Approximate p-value	4.6012E-5

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 TCE



Mann-Kendall Trend Analysis

n	71
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	201.4233
Standardized Value of S	-7.3328
M-K Test Value (S)	-1,478
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.7813
OLS Regression Intercept	165.4423

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Trichloroethene	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:11:47 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

TCE

General Statistics

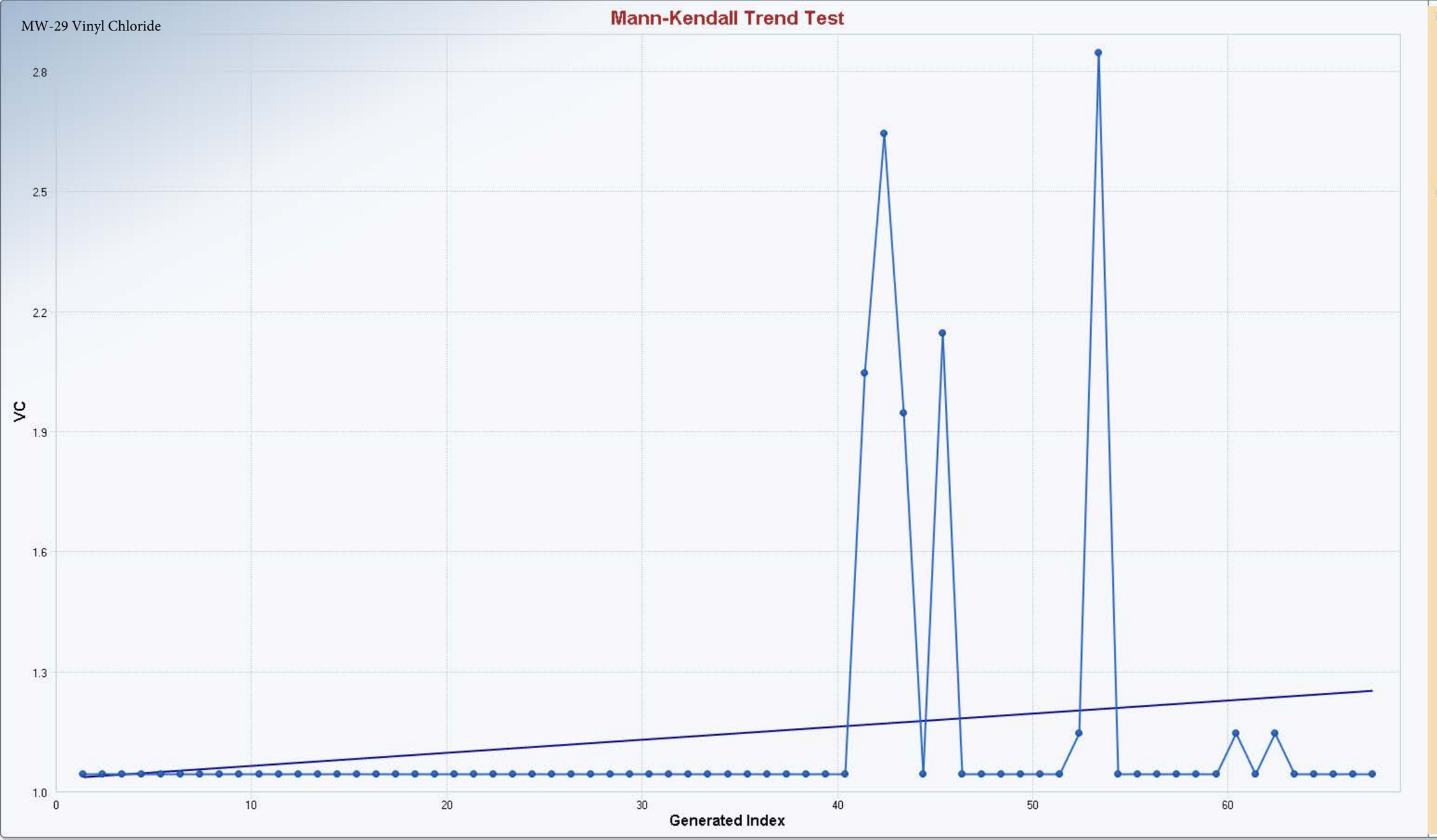
Number or Reported Events Not Used	0
Number of Generated Events	71
Number Values Reported (n)	71
Minimum	1
Maximum	500
Mean	65.32
Geometric Mean	33.89
Median	33.4
Standard Deviation	99.72
Coefficient of Variation	1.527

Mann-Kendall Test

M-K Test Value (S)	-1478
Critical Value (0.05)	-1.645
Standard Deviation of S	201.4
Standardized Value of S	-7.333
Approximate p-value	1.127E-13

Statistically significant evidence of a decreasing trend at the specified level of significance.

MW-29 Vinyl Chloride



Mann-Kendall Trend Analysis

n	67
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	103.7320
Standardized Value of S	2.3329
M-K Test Value (S)	243
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0098

OLS Regression Line (Blue)

OLS Regression Slope	0.0032
OLS Regression Intercept	0.9896

Statistically significant evidence of an increasing trend at the specified level of significance.

MW-29 Vinyl Chloride	**Mann-Kendall Trend Test Analysis**	
User Selected Options		
Date/Time of Computation	ProUCL 5.16/3/2019 11:12:35 AM	
From File	MW-29.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

VC

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	67
Number Values Reported (n)	71
Number Values Missing	4
Number Values Used	67
Minimum	1
Maximum	2.8
Mean	1.1
Geometric Mean	1.067
Median	1
Standard Deviation	0.352
Coefficient of Variation	0.32

Mann-Kendall Test

M-K Test Value (S)	243
Critical Value (0.05)	1.645
Standard Deviation of S	103.7
Standardized Value of S	2.333
Approximate p-value	0.00983

Statistically significant evidence of an increasing trend at the specified level of significance.

APPENDIX K

Waste Minimalization Certification

Duty to Minimize Waste

Alliant Techsystems Operations LLC (Permit No. MDD003067121) has a program in place to reduce the volume and toxicity of hazardous waste that it generates to the degree determined to be economically practicable. This program includes segregation of waste streams when feasible and continuing tracking of waste quantities and types being generated to identify further opportunities for hazardous waste reduction. The facility's current method of treatment, storage, and disposal is the most practicable method currently available that minimizes the present and future threat to human health and the environment.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person who manages the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

July 2, 2019

Richard L Zambito P.E.
Sr. Principal Engineer Environmental
Alliant Techsystems Operations LC