REMEDIAL INVESTIGATION REPORT
PROCINO PLATING PROPERTY (DE-0344)
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

Prepared for:

State of Delaware
Department of Natural Resources and Environmental Control
Site Investigation and Restoration Section
391 Lukens Drive
New Castle, Delaware 19720

On behalf of:

Procino Enterprises Inc.
901 South Market Street
Blades, Delaware 19973

Prepared by:

Ten Bears Environmental
1080 S. Chapel Street
Newark, Delaware 19702

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Executive Summary

This report summarizes the Remedial Investigation (RI) conducted by Ten Bears Environmental Associates Company for Procino Enterprises Inc. from May 2012 to August 2015 at the Procino Plating Site (DE-0344), located at 901 South Market Street in Blades, Sussex County, Delaware. The RI was performed in accordance with State of Delaware, Department of Natural Resources and Environmental Control (DNREC) Site Investigation and Restoration Section (SIRS) requirements and their oversight. The RI was performed to determine the magnitude and extent of environmental site conditions, primarily the distribution of chromium in groundwater identified by SIRS in their 2011 Site Inspection, and to assess the sites' potential to impact human health and the environment.

Procino Enterprises Inc. has operated at the 1.16-acre property since 1985. Current operations are limited to the fabrication of griddle tops and associated hard chrome plating. Surrounding properties are primarily mixed residential and commercial uses, but include a former metals plating facility (Peninsula Plating) located approximately 0.5 miles to the north and two Town of Blades' public water supply wells located 0.8 miles to the north.

DNREC's 2010 Preliminary Assessment, in consideration of the electroplating history, the sandy shallow soil, the shallow depth to groundwater, and the proximity of public water supply wells in the unconfined Columbia aquifer, recommended further Site evaluatione. DNREC's 2011 Site Inspection identified total chromium in groundwater at a concentration above EPA's Maximum Contaminant Level (MCL) of 100 micrograms per liter (µg/L, parts per billion) in one of six onsite monitoring wells. None of 16 potable water samples from nearby home wells contained chromium at a concentration near or above the MCL. None of 26 soil samples contained chromium at a concentration were above DNREC's 214 mg/kg soil screening level. Although analyzed, cyanide was not detected in onsite SI samples (6 groundwater and 26 soil), it was detected in a nearby home well sample at a level (20 µg/L) below cyanide's 200 µg/L MCL. Procino Enterprises joined DNREC's Voluntary Cleanup Program in order to further evaluate environmental site conditions by performing a RI.

<u>RI Scope:</u> RI field work was performed over 2012-2015 in several phases to characterize subsurface stratigraphy, collect soil and groundwater samples for laboratory analysis, and determine water table elevations and groundwater flow direction. Results of the laboratory analyses were used to determine the extent and magnitude of contaminants, and to assess potential risks posed by the site to human health.

- Soil chromium levels in fourteen 2012 samples from below the concrete slab to depths of 8.5-feet at the former Chrome Tank locations were below DNREC's chromium soil Screening Level of 214 mg/kg, thus not indicative of a residual sub-slab soil source.
- Six May 2012 groundwater samples (three new downgradient RI wells plus three SI wells) were analyzed for Target Analyte List metals and cyanide; one sample (MW-6) contained chromium at a concentration above the 100 µg/L MCL. Downgradient chromium levels ranged from not detected (<1.1 µg/L) to 25 µg/L.
- In May 2013, five new RI wells (three offsite Geoprobe™ wells and two onsite deeper double-cased hollow-stem auger wells) were installed and sampled for chromium and cyanide with three 2012 RI wells and two SI wells. Two of the ten samples (MW-6 and MW-10) contained chromium at a concentration above the MCL. The 2013 chromium and cyanide levels from the home well were 50% of the 2011 SI levels, and were well below the MCLs.

- Four RI depth-to-groundwater measurement events in 2012 – 2013 confirmed the south (to slightly southwest) groundwater flow direction reported in DNREC's SI.

RI groundwater assessment in 2014-2015 included:

- Fifteen 2014 groundwater samples updated the 2013 chromium and cyanide concentrations and depth-to-groundwater measurements, and again demonstrated a southerly groundwater flow direction.
- Four April 2015 RI wells were installed on properties south-southeast of the Site, and were sampled in May 2015 with five RI wells where chromium was detected in 2014. All offsite chromium concentrations were below the MCL; one sample from onsite well MW-6 (115 µg/L), slightly exceeded the 100 µg/L MCL.
- 2015 groundwater elevations again indicated southerly shallow groundwater flow.

Interim Remedial Action: A grid comprising 27 soil samples was collected under the floor slab inside the plating plant to delineate presumed source chromium concentrations. Eight samples from 6 of the 9 borings had chromium concentrations above 214 mg/kg. Elevated soils were excavated to the extent practicable and disposed offsite per the DNREC-approved revised Interim Action Work Plan (May 19, 2015); however, two post-excavation samples indicated residual soil chromium above the Screening Level.

RI Findings: Total chromium was the sole site-related COC detected in RI sampling at a concentration above a regulatory standard or screening level. Although detected in one offsite home well, cyanide was not detected in site samples in either the RI or DNREC's 2011 SI.

Chromium groundwater plume boundaries have been delineated. Consistent diminishing of groundwater chromium concentrations reported 2012–2015 demonstrates a reduction in chromium released from soil to groundwater, and an attenuation of plume extent and magnitude. May 2015 chromium in offsite groundwater downgradient of the Site was below the drinking water MCL, thus does not pose human health ingestion risks. Southerly groundwater flow direction was determined in all RI measurements.

Concomitant with the 2011 SI detection of the chromium groundwater condition, DNREC was concerned by the potential for rapid plume migration to downgradient receptors due to the apparent high hydraulic conductivity of the clean homogeneous sand encountered in their 20-foot SI soil borings. However, RI drilling demonstrated that underlying fine-grained interbeds occur below 20-foot depths within the granular Coastal Plain formations. Clay had been reported at the 20-foot termination of two SI borings (MW-4 and MW-6), and was similarly reported in soil boring logs from nearby Peninsula Plating wells MW-1 and MW-3. These findings comport with Delaware Geological Survey regional mapping of approximately 20 feet of shallow clean sand (10 feet of sandy Dune Deposits and 10 feet of sandy Turtle Branch Formation) underlain from an approximate 20 foot depth by heterogeneous 50-100 foot thick Beaverdam Formation deposits consisting of variable sediments ranging from coarse sand and pebbles to fine silty clay.

Data obtained for the RI from a DNREC Division of Water well search documented that all but one of the home wells west of the Site obtain water from screened intervals below fine-grained interbeds at depths greater than 70 feet (70-80 feet in 2 wells 75-85 feet in 1 well; and 100-110 feet in 4 wells). One home well screened from 43-48 feet was sampled in the SI and three times in the RI. DGS drilling logs of older local wells (including the Town public wells) likewise

describe fine-grained beds at depths below 20 feet, with well screens set below these layers (65-95 feet for the Town wells) in a deeper, coarser, more productive zone at the base of the unconfined aquifer.

Although RI boring spacing does not permit an assessment of the lateral continuity of the fine-grained layers, their presence, even if discontinuous, provides lower permeability zones which inhibit vertical migration of groundwater locally within the Columbia aquifer, as reflected by DGS's description as "unconfined to semi-confined." These interbeds combined with the RI findings of a southerly groundwater gradient explain the lack of discernible chromium impact in all but the one of the SI home wells located to the west-southwest of the Site.

Assessment of Human Health Risk:

SOIL: 2012 sub-slab soil sampling chromium results were below DNREC's 214 mg/kg Screening Level. 2015 pre-Interim Action soil sampling showed chromium levels exceeding the Screening Level in eight of 27 delineation sub-slab samples from below the floor slab where the former chrome tanks were formerly located. Accessible elevated chromium soils were excavated in the July 2015 Interim Action (although constrained near the foundations) and were disposed offsite. Although pockets of chromium soils above the Screening Level concentration remain as indicated in two (2) of seven (7) post-excavation samples, they are now isolated below clean backfill and capped by a concrete floor slab. RAIS calculations of soil risk to commercial /industrial workers by total chromium at the 214 mg/kg Screening Level concentration exceeded HSCA allowable 1E-05. However, the area has been capped, and subsurface soil is not (nor will it be in the future) accessible for routine site worker contact. Thus the subsurface soil exposure pathway is not complete, and soil risks are not anticipated to occur for current or future onsite commercial /industrial workers. An acceptable hypothetical risk of 6E-07 was calculated for future Excavation Workers potentially be exposed to chromium at the maximum concentration detected in the post-excavation subsurface soils (392 mg/kg).

GROUNDWATER: Chromium concentration decreased over the four RI groundwater sampling events with 2015 attainment of concentrations below the MCL in 19 of 20 wells, including all offsite wells. The 2015 MW-6 concentration of 115 µg/L, slightly above the 100 µg/L MCL, was 10% of the SI concentration of 959 µg/L. This trend demonstrates a reduction in chromium supply and the action of natural attenuation conditions in the aquifer.

MW-6 (or any other monitoring well) is not used to provide drinking water. Drinking water at the property where MW-6 is located (the site) is provided by the Town of Blades, therefore no complete pathway exists by which site MW-6 groundwater is ingested. The consistent southerly hydrologic gradient demonstrates site groundwater flow direction away from, not towards, the public supply wells to the north. No groundwater ingestion receptors are located on the Site at MW-6 where chromium concentration exceeds the MCL, thus no unacceptable human health risks are posed at or by the Procino Plating Site groundwater under current or likely future conditions. The rapid attenuation trend observed in groundwater chromium concentrations, reinforced by the Interim Action source removal, indicate that future conditions are likely to continue to improve.

Remedial Recommendations: Additional active remediation (beyond the Interim Soil Removal Action and capping of residual subsurface soil) is not warranted due to the incomplete exposure pathways at the limited Procino Plating Site areas where residual chromium exceeds a soil

screening level (sub-slab soil in 2 of 7 post-excavation samples) or a groundwater MCL (the MW-6 well). Both of the "exceedances" occur at locations on the Site. We recommend a remedy to control future Site uses, consisting of an Environmental Covenant (EC) placed upon the Site deed to prohibit both the use of site groundwater for drinking water and the performance of ground-intrusive activities in the Interim Action soil Excavation Area unless granted prior DNREC approval.

To document that future groundwater chromium levels remain below the MCL (or continue to decrease towards the MCL at MW-6), we recommend that Procino Enterprises undertake regular periodic groundwater monitoring at selected wells under a DNREC-approved Long Term Stewardship (LTS) Plan to be summarized and reported annually to DNREC. Upon the recordation of the Environmental Covenant and DNREC's approval of the LTS Plan, Procino Enterprises will be eligible for a Certification of Completion of Remedy (COCR) from DNREC. Once the LTS groundwater monitoring data demonstrates attainment of groundwater chromium with the MCL, monitoring efforts can be terminated (upon DNREC's concurrence) and the groundwater EC restrictions can be removed from the property deed.

1.0 INTRODUCTION

1.1 Purpose of Remedial Investigation Report

This Remedial Investigation Report was prepared by Ten Bears Environmental (TBE) on behalf of Procino Enterprises to present the results of the Remedial Investigation (RI) performed at the Procino Plating Site (DE-0344), herein "the Site" or "the Property," located at 901 South Market Street in the Town of Blades, Sussex County, Delaware (Figure 1). The purpose of the RI was to characterize environmental site conditions as specified by the regulations, guidances, and policies under Delaware's Hazardous Substance Cleanup Act (HSCA) administered by the Department of Natural Resources and Environmental Control (DNREC) Site Investigation and Restoration Section (SIRS), including:

- Delaware Hazardous Substance Cleanup Act, 7 Del. C., Chapter 91;
- Delaware Regulations Governing Hazardous Substance Cleanup (rev. 8/2012);
- HSCA Guidance Manual (October, 1994);
- VCP Guidance Manual (rev. March 1998);
- Remediation Standards Guidance under the HSCA (December 1999);
- Standard Operating Procedures for Chemical Analytic Programs (rev. 2/26/2015);
- HSCA Human Health Risk Assessment Guidance (April 2015).

This Report summarizes the findings of the Remedial Investigation conducted in phases from 2012 to 2015, as well as descriptions of pertinent physiographic characteristics of the Site and vicinity; descriptions of previous Site evaluations; a summary of the RI field exploration and sampling activities; the results of subcontractor laboratory analyses; discussions of the investigation findings; a Human Health Risk Assessment; an Interim Action Soil Source Removal, and the RI conclusions as to whether Site conditions warrant the performance of additional remedial actions to protect human health and the environment.

1.2 Site Background

1.2.1 Facility Description

The Procino Plating Site is located within the Town of Blades, which lies southeast of the City of Seaford in Sussex County, Delaware (Figure 1). The 1.16-acre Procino Plating Site occupies two Sussex County tax parcels (132-1.15-187.00 and 132-1.15-188.00) at 901 South Market Street, also known as US Route 13 (Alternate). The Site is bounded by South Market Street on the east, a Conrail track on the west, West 9th Street to the north, and West 10th Street to the south.

The Site and the surrounding areas to the north, east, and south lie within the municipal boundaries of the Town of Blades (shaded gray on Figure 2), and are provided public water and sewer service by the Town. The surrounding area is largely in residential use as shown on Figure 3 (Town of Blades, 2008), although a commercial use area lies directly south of the Site. A neighborhood west of the Site across the railroad track

(shaded blue on Figure 2) is not currently located within the Town boundaries, thus those residents obtain their potable water from domestic wells; this neighborhood is shown on Figure 4 (Town of Blades, 2008) as a possible future Town annexation area. Approximately 0.5 miles north of the Procino Site is the Peninsula Plating Site, a former metals plating facility and State of Delaware HSCA site where EPA conducted a Removal Action in 1995. The adjacent parcel north of the Peninsula Plating Site is the location of two Town of Blades' municipal water supply wells (shown on Figure 2). Delaware Geological Survey (DGS) provided drilling logs of several existing deep wells (shown on Figure 2), as well as regional stratigraphic and hydrologic information as described in Section 3 of this report.

1.2.2 Site History

The following history was compiled from information provided by Procino Enterprises, the review of aerial photographs obtained from several sources, and regulatory records obtained from Delaware's online Environmental Navigator (DEN) website. Sanborn Fire Insurance Maps are not available for the Site or the vicinity.

Procino Plating Property

According to aerial photographs obtained from the former Delaware DataMIL website, the large building on the eastern part of the Site was constructed sometime after 1937 but prior to 1954; its original use is not known.

Procino Plating began operations in 1983 performing ornamental /decorative plating using copper, nickel and chrome. They moved onto the Blades premises in 1985. Chrome was stored in two tanks inside the plant adjacent to the MW-6 location. When Procino Plating moved into the facility, the building had a wooden floor underlain by a crawl space on top of the soil below the building. The wood floor was removed and a concrete slab was installed by Procino Plating in the late 1990s. A second building was added in 1993 primarily to house silver and electroless nickel plating for commercial and military customers. Procino Plating purchased the two Site parcels in May and July of 1996. In approximately 1996, Procino Plating installed a subsurface wastewater collection and treatment system to collect and treat the wash and rinse "bath" water and the floor drains from the plant. The business employed 60 people at its peak in 1997. Two smaller buildings were constructed between 1997 and 2002, and were visible on the 2002 aerial photograph reviewed by TBE. Following business downturns, the plating process in the second building was dismantled in 2007, and the wastewater piping system and drains were sealed with concrete. The chrome tanks were drained and removed from service in 2009. The business currently employs 10 persons and performs a much reduced operation of fabrication of griddle tops and associated hard chrome plating.

Regulatory Site History

In 1985 Procino Plating applied for and was issued an Industrial Wastewater Contribution Permit by Sussex County which allowed them (subject to permit limitations) to discharge pretreated process wastewater into the Town of Blades Sanitary Sewer system. Procino Plating also generated hazardous waste onsite, including filter-cake from the wastewater

pretreatment system, which was managed under the "cradle to grave" hazardous waste disposal program and shipped off site to permitted disposal or recycling facilities.

In June 1994 Procino received a Notice of Violation (NOV) from DNREC citing labeling, training and operational deficiencies related to the handling of hazardous waste. Corrective action by Procino resulted in an October 1994 DNREC notification letter stating that the deficiencies had been corrected. In October 1995 DNREC again issued a NOV regarding hazardous waste management practices and responsive corrective action was taken and compliance attained as documented in a March 1996 DNREC letter. Another NOV was issued by DNREC in December 1998 with a subsequent corrective action. None of the NOVs cited spillage, discharges, or releases of hazardous wastes.

The US EPA conducted compliance inspections of the Procino facility in September 2001 which resulted in the issuance of a February 2002 NOV citing numerous hazardous waste management violations for exceedance of the 90-day onsite storage timeframe; again no spillage, discharges or releases were involved. In December 2007 and 2008, DNREC and the US EPA conducted inspections, collected samples and interviewed employees at the Procino Plating Site. These inspections coincided with the 2007 discontinuation of plating operations in the second building when equipment was being dismantled to create rental space.

In May 2010 the EPA exercised a search warrant and seized the company records and took samples. These actions and the follow up investigation conducted by the USEPA led to criminal charges against Procino Plating (since resolved) regarding the storage of unpermitted hazardous wastes and violations of the wastewater treatment permit, the latter due to newly imposed permit conditions prohibiting certain hazardous wastes from being treated and then discharged into the sewer system. Although the discharge of cyanide was evaluated in EPA's investigation, no evidence was shown that cyanide was spilled, disposed or released from the site. Likewise, no charges were presented indicative of a release of hazardous substances at the site. Subsequently, Procino Plating terminated its use of the industrial wastewater discharge permit, concreted the piping, and modified its operations by use of a closed loop system. Currently small quantities of hazardous waste are generated and are periodically shipped offsite for disposal at a permitted facility.

1.2.3 Previous Investigations

DNREC SIRS performed a Preliminary Assessment (PA) at the Procino Plating Site in September 2010 under a cooperative agreement with the US EPA. Based upon the approximately 25-year electroplating use of the property, the sandy shallow soil, and shallow groundwater depth, DNREC recommended the performance of a sampling evaluation at the Site.

DNREC SIRS conducted a Site Inspection (SI) in May of 2011 in accordance with their March 2011 Work Plan, also under a cooperative agreement with EPA. Seven shallow soil borings (to 10 feet) and six deeper borings (to 20 feet) were completed for the installation of six groundwater monitoring wells. During drilling, 26 soil samples were

collected (two depths in each of 13 borings) and analyzed at SIRS's lab, from which five were sent to a HSCA approved lab for confirmatory analyses. Six groundwater samples were collected and analyzed by DNREC's Environmental Lab (Dover, Delaware) for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total and dissolved metals; analysis of pesticides, PCBs, and cyanide was performed at a HSCA laboratory. Drinking water samples collected by DNREC's Office of Drinking Water (ODW) were collected from twelve home wells in the neighborhood west-southwest of the Procino Plating property and were analyzed for trace metals, cyanide, and VOCs by the State of Delaware's Public Health Laboratory (Smyrna, Delaware).

DNREC SIRS's soil analyses of the 26 soil samples reported no detectable levels of VOCs or SVOCs, or elevated metals; chromium concentrations were below DNREC's 35 mg/kg Uniform Risk-Based Standard (URS) for residential hexavalent chromium. The results from the HSCA-approved laboratory confirmed that, excepting iron (considered to be background), soil concentrations were below residential URS's. Groundwater sample results reported chromium in one sample and a pesticide (dieldrin) in three samples at concentrations above EPA's Maximum Contaminant Level (MCL) for drinking water, also DNREC's groundwater screening levels. Eight (8) of the 12 domestic well samples contained manganese and one sample contained zinc at concentrations above EPA's secondary MCL; the elevated zinc was not confirmed in a later ODW re-sampling event.

Based upon the detection of chromium and dieldrin in site groundwater samples and the nearby (possibly downgradient) use of groundwater as potable water, DNREC required further evaluation of the Site in a Remedial Investigation performed through the Voluntary Cleanup Program.

1.2.4 RI Planning and Scoping

Procino Plating entered into a Voluntary Cleanup Program agreement with DNREC in 2011. The RI planning and scoping began in January of 2012. RI activities were performed in phases in accordance with TBE's Work Plans and DNREC input.

A Phase 1 Work Plan (January 16, 2012) was submitted to SIRS, revised after a March 1, 2012 scoping meeting, resubmitted to SIRS March 21st, subsequently revised per a DNREC SIRS comment letter of April 2, and resubmitted April 6, 2012 along with a HASP and Sampling and Analysis Plan. Following DNREC's approval, RI field work commenced in late April 2012. Phase 1 RI findings were submitted in September 2012, which included recommendations for additional groundwater sampling.

After a scoping meeting on November 16, 2012, TBE submitted a Work Plan (WP) on December 5, DNREC SIRS' commented on the WP (January 17, 2013), the revised WP was submitted (January 30, 2013) which was approved by SIRS March 12, 2013. Subcontractor procurement and offsite property access approvals were conducted in April of 2013, and the Phase II RI field work was largely performed in May of 2013.

The Phase III scoping began following receipt of DNREC's April 2014 draft RI Report comment letter requiring additional RI work. After a planning and access approval

period, Phase III samples were collected in May of 2014. Upon receipt of those results, DNREC required the expansion of the chromium delineation by installing Phase IV RI wells. After a fall 2014 planning and scoping period with DNREC and a lengthy access negotiation period with property owners, Phase IV wells were installed in April 2015 and sampled in May 2015.

1.2.5 Peninsula Plating Site

A second metals plating facility (Peninsula Plating Site, DE-0287) is located approximately 0.5 miles north of the Procino Plating Site as shown on Figure 2. The Peninsula Plating Site is described below, and site data are found in Appendix A.

In early 1995, DNREC's Hazardous Waste Management Branch conducted an inspection of the Peninsula Plating operation; observations included the presence of various plating chemicals including nickel sulfate, sulfuric acid, chromic acid, nickel chloride, and copper cyanide. The company closed shortly thereafter, according to DNREC records "*...following a history of non-compliance with industrial waste discharge permits, Emergency Planning and Community Right-to-Know requirements, as well as concerns from the Town of Blades Fire and Police Departments.*" DNREC's Emergency Response Team (ERT) visited the site and notified EPA's ERT. According to DNREC site files, the former plating building was abandoned and contained "*numerous vats, tanks, drums and small containers of hazardous materials left unsecured and abandoned, including flammable liquids, corrosive liquids, oxidizers, cadmium-contaminated liquids and chromium-contaminated solids.*" EPA's ERT conducted a CERCLA Removal Action at the abandoned Peninsula Plating site from mid-late 1995 which included the removal of 78 55-gallon drums of hazardous wastes and 30 cubic yards of hazardous solids.

DNREC SIRS conducted a Site Inspection (SI) of the abandoned Peninsula Plating site in late 1999 in which samples of soils and groundwater were collected and analyzed for a broad range of parameters. Metals reported in SIRS' laboratory screening results at concentrations above DNREC's screening levels included arsenic, chromium, iron, manganese, vanadium, thallium, and zinc. Seven soil samples were sent to DNREC's Environmental Lab for confirmatory analysis, of which three were analyzed for metals and cyanide (see Appendix A). No metals were reported at concentrations above DNREC's soil screening levels; however, all three samples contained chromium (2.4 to 9.4 milligrams per kilogram (parts per million)) and cyanide (0.55 to 0.75 mg/kg).

Three 12-16 foot monitoring wells were installed (locations are shown on the map in Appendix A); MW-1 east of the plant; MW-2 northeast of the plant, and MW-3 farther north of MW-2. Silty and sandy clay was logged from 11 to 16 feet in MW-1, and from 10 to 12 feet in MW-3. Only the background metals iron, manganese, and aluminum exceeded DNREC's standards in the groundwater sample lab results. No well elevations were surveyed, thus the groundwater flow direction was not determined. However, based upon the south (to slightly southwest) local groundwater flow direction measured in numerous events for the RI of the Procino Plating Site, none of the three Peninsula Plating monitoring wells were installed downgradient (south-southwest) of the plant. As a result, the SI groundwater samples do not represent groundwater quality downgradient of

the Peninsula Plating plant. A later 2007 Phase II / Brownfield Investigation by others did not include either the installation of new wells or the surveying of the SI wells; again the groundwater flow direction was not determined.

In summary, both chromium and cyanide were detected in soil at the Peninsula Plating facility located 0.5-miles upgradient of the Procino Plating Site. Three groundwater monitoring wells were installed but none were located downgradient (south-to-southwesterly) of the plating building. As a result, groundwater quality downgradient of the Peninsula Plating Site (towards the neighborhood using home wells) was never sampled, and potential chromium or cyanide levels in groundwater downgradient of the Peninsula Plating Site were never determined.

2.0 PHYSIOGRAPHIC SITE CHARACTERISTICS

The physical characteristics of the Procino Plating Site and the surrounding vicinity are described in the following sections.

2.1 Geologic Setting

The surficial and shallow geologic units in the Procino Plating Site vicinity are mapped to a depth of approximately 70 feet below the ground surface (an elevation of -20 feet below mean sea level (msl)) by the Delaware Geological Survey (DGS) in Geologic Map #23 (***Geologic Map of the Seaford West and Seaford East Quadrangles, 2015)***. DGS Map #9 (***Geohydrology of the Seaford Area, 2004***) describes the stratigraphy as "complexly interlayed hydrogeologic units (aquifers and confining beds"). The Coastal Plain unconsolidated sedimentary deposits are described below from shallow to deep, and are illustrated in the DGS cross-section from Map #23 which is shown as Figure 5.

The surface unit comprises up to 10 feet of Quaternary age Dune Deposits (Qd on Figure 5), and consists of well-sorted fine-medium tan sand with thin brown silty soil lamellae.

The underlying Turtle Branch Formation is an older Quaternary deposit (Qtb on Figure 5) formed by fluvial and beach deposition during a high sea-stand. It typically consists of up to 10 feet of clean, well-sorted fine yellow to brown sand, which coarsens with depth, with rare-to-common laminae of gray-to-grayish brown clayey silt within the sand beds.

The older (Tertiary age) Beaverdam Formation (Tbd on Figure 5) underlies the Turtle Branch Fm of the Nanticoke River Group. It is a heterogeneous unit ranging from very coarse sand with pebbles to a silty clay (note the silty zones shown by DGS on Figure 5), which ranges from 50 to 100 feet thick in two facies:

- Upper facies of fine-medium sand with sandy silt, clayey sandy silt, and clayey silt.
- A lower (coarser) facies of medium- coarse sand, sandy gravel, and gravelly sand with rare beds of silty clay and clayey silt, typically with a basal gravel layer.

Although of differing ages, the gravelly base of the Beaverdam Fm is often in hydrologic subcrop with the granular upper portion of the underlying (older Tertiary) Manokin (now

Cat Hill) Formation (DGS, 2004). This results in a combined 100 feet or more of predominantly granular deposits which together comprise the unconfined aquifer.

The Cat Hill Fm (formerly the Manokin Fm per DGS 2004) is mapped (DGS, 2004) to be approximately 30 feet thick in the site vicinity although the thickness varies over the Seaford map area. It also consists of two facies:

- an upper "B-portion" of medium to coarse sand and common gravelly sand; and
- a lower finer "A-portion" consisting of blue-gray silty clayey sand and silty sand.

The St. Mary's Formation underlies the Cat Hill (Manokin) Fm at approximate depths of 90 -100 feet (elevation -80 msl, DGS, 2004). It is comprised of gray to blue-gray fine-grained materials including silty sandy (fine) clay, clayey sandy silt, and silty clay, also with beds of fine-medium sand and fine-medium gravel.

Older sedimentary deposits underlie the St. Mary's Fm to the bedrock found at a depth of 3,700 to 4,000 feet below the surface.

2.2 Land Surface Topography

The U.S. Geological Survey (USGS) topographic map for the Seaford East Quadrangle depicts the surface elevations at the Site as ranging from approximately 10 to 20 feet above mean sea level (msl). A Delaware DataMIL map with a smaller contour interval showed Site surface elevations to range from 14 feet msl on the western border to 18 feet msl on the eastern border. The land surface is fairly flat with a gentle slope to the west-southwest, west towards the Nanticoke River and south towards Morgan Branch a small tributary 1,200 feet south of the Site which flows west to the Nanticoke River. Observations by TBE indicated a flat Site topography with no discernable slope direction.

The runoff of surface water generally follows surface topography towards the west-southwest, although it is considered to be likely that runoff from the eastern part of the Site is directed to the Town of Blades storm sewer system along South Market Street.

2.3 Site Soil Types

The U.S. Department of Agriculture (USDA) Soil Conservation Service soil survey mapped the soils at the Site as entirely underlain by the Henlopen-Rosedale-Urban Land complex, 0-2% slopes. It is a non-hydric soil complex derived from sandy eolian deposits (also described by the DGS as dune deposits) and loamy fluviomarine sediments. The typical soil profile consists of approximately 46 inches of loamy sand, underlain to 62 inches by sandy loam, then from 62 to 80 inches by sand. According to the USDA, the water table typically occurs within depths of 40 to 80 inches (3.3 to 6.6 ft).

2.4 Hydrogeologic Setting

2.4.1 Groundwater Hydrology

As described in Section 2.1, the DGS describes the Seaford vicinity as ***"complexly interlayed hydrogeologic units (aquifers and confining beds)***". Because of the heterogeneity within formations, the DGS also stated that ***"...individual hydrologic units (i.e., aquifers) locally consist of two or more lithostratigraphic units (i.e., formations)"*** (DGS, Hydrologic Map #9).

The shallow water-table aquifer in the Seaford map area is the Columbia aquifer. The main (thickest) lithostratigraphic unit is the Beaverdam Formation and, where present, granular sections of the overlying Dune Deposits and Turtle Branch Fm, and where present, granular sections of the underlying Manokin (Cat Hill) Formation. Although the underlying St. Marys Formation regionally forms the base of the unconfined aquifer, locally fine-grained beds within the Beaverdam Fm and /or the Manokin Fm can also form the base of the unconfined aquifer.

According to the DGS, the Columbia aquifer functions both as an unconfined and a semi-confined aquifer, with a saturated thickness ranging from as little as 30 feet up to more than 100 feet, depending upon the local hydrologic interconnection of the granular deposits and the occurrence of fine-grained clay interbeds. Natural water quality is generally good although locally high iron concentrations can require treatment and low pH can cause corrosion and dissolution of metal plumbing components. The Columbia aquifer is rated "fair to excellent" in water yielding characteristics. The general rate of recharge by infiltration of precipitation through the shallow soil to the groundwater table was mapped as "good" by the DGS on Map #12.

Public drinking water and sewer service is provided to the Procino Plating Site and the surrounding municipal area by the Town of Blades (shown on Figures 3, 4, and 6). According to DNREC well permit records and the Town of Blades' Source Water Assessment Program Plan (SWAPP, January 2002), the town obtains its water supply from two Columbia aquifer production wells located approximately 0.8 miles north of the Procino Plating Site. Both wells are screened from depths of 66 to 96 feet below the ground surface. More information about the public wells is found on Table 1.

An elliptical Wellhead Water Resource Protection Area (WRPA) surrounds the two Town of Blades public water supply wells (Figure 6). The WRPA extends approximately 0.3 miles across and 0.5 miles long, and encompasses the Procino Plating Site.

Private domestic wells provide potable water to homes located in the neighborhood west of the Site which lie outside of the Town of Blades municipal boundaries and thus are not provided public water (see Figures 2, 3, 4, and 6). Available well information regarding the depths and screened intervals of the domestic wells having DNREC well permits was obtained using a Freedom of Information Act (FOIA) well search from DNREC's Division of Water, and is summarized on Table 1; copies of well records are found in

Appendix B. Local home wells extended to depths ranging from 50 feet to 150 feet below the ground surface, and were completed with 10 feet of well screen (one well has 5 feet of screen) placed at the base of each well. Home addresses not listed on DNREC's well permit files are assumed to use wells which were installed prior to the 1969 start of DNREC's well permit process. No Wellhead Water Resources Protection Areas are shown around these neighborhood wells on Sussex County mapping or the Town of Blades Comprehensive Plan.

2.4.2 Surface Water Hydrology

The Town of Blades is located along the southern bank of the Nanticoke River (Figure 1). The Procino Plating Site is located approximately 0.6 miles south-southeast of the Nanticoke River. Uses of the Nanticoke River in the Blades vicinity include industrial water supply, primary and secondary contact recreation, and agricultural water supply in the freshwater reaches (DNREC, Surface Water Quality Standards, 2011).

The Procino Plating Site does not lie within the 100-year flood zone of the Nanticoke River or Morgan Branch as mapped by Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (see Figure 6).

2.5 Ecology

The Procino Plating Site is located within the incorporated limits of the Town of Blades, Delaware. Land uses within the mapped Wellhead WRPA surrounding the Procino Plating property are 71% urban uses and 21% commercial uses (Figure 6, Town of Blades Comprehensive Plan, 2008). The surface cover of town streets and buildings is shown on the Sussex County Tax Map in Figure 2. The Site is not adjacent to the Nanticoke River, mapped wetlands, or any other ecologically sensitive area (ECSA) listed in DNREC's Remediation Standards Guidance. The Site is within 2,000 feet of mapped Palustrine Emergent wetland, however it is separated from the wetland and the Nanticoke River by town streets, a railroad track, and residences. The Site does not meet ECSA criteria therefore ecological evaluation of the Site was not warranted for this RI.

3.0 DETERMINATION OF THE EXTENT AND MAGNITUDE OF CONTAMINANTS

Prior to the RI, DNREC collected of 26 soil and six shallow groundwater samples at the 1.16-acre Site in their 2011 Site Inspection (SI). These samples were analyzed for a wide range of metals (EPA's Target Analyte List) and organic contaminants (EPA's Target Compound List). SI sample results described in Section 3.1 provided the foundation for the sample collection program performed in subsequent RI phases.

The RI work determined the nature and extent of Site-related contamination through the performance of a field sampling program in which samples of soil and groundwater were collected from selected target locations. Soil was sampled from below the former chrome tanks under the plating plant floor. Groundwater was collected from the "worst-case" SI monitoring

wells and SI home well, as well as from twelve (12) new RI wells installed at purposive locations on, and downgradient of, the Procino Plating Site. RI groundwater samples were initially analyzed for full TAL metals and cyanide as representing contaminants detected in the SI and potentially associated with plating operations at the Site. Subsequent analyses focused on chromium and cyanide as the identified Contaminants of Concern, with 2015 sampling program limited to chromium as cyanide had not been detected in previous RI sampling.

No samples of surface water, sediments, or soil gas were collected, nor were any special types of investigative methods (geophysical logging, magnetometer testing, etc.) performed for this RI.

3.1 SI Scope / Identification of Contaminants of Concern

In the SI, 26 soil samples from 13 soil borings were analyzed at DNREC SIRS's lab for selected TCL organics and TAL metals constituents. Five soil samples were analyzed at a HSCA-approved laboratory for full TCL and TAL compounds. Six groundwater monitoring wells were installed and sampled for full TCL and TAL parameters; well construction information is summarized on Table 2. The locations of the 13 SI borings, from which 26 soil samples and 6 groundwater samples were collected, are shown on Figure 7 along with DNREC's interpreted groundwater flow direction (from SI Report, DNREC, September 2011). Twelve domestic wells samples from the neighborhood to the west-southwest of the Site (also shown on Figure 7), were analyzed for trace metals, cyanide, and volatile organic compounds (VOCs).

The locations of, and the laboratory results from, DNREC's SI samples provided the identification and distribution of site Contaminants of Concern (COCs), primarily the detection of chromium in a site groundwater sample at a concentration above the EPA's primary drinking water standards. Other metals and organic compounds detected in the SI sampling were present at levels below the regulatory standards or were determined by SIRS to represent background metals levels. The above SI findings were augmented by the RI sampling of TAL metals, later limited to cyanide and total chromium.

3.2 Phase I RI (2012) – Soil Source Assessment and Groundwater Evaluation

The RI sample network was supplemented in the RI by the collection of additional samples at probabilistic (non-random) locations selected in order to identify the potential locations and volume of the source of the chromium detected in the SI in MW-6 groundwater, and to determine the magnitude (concentration) of chromium occurrence in groundwater and the extent of its migration. RI efforts were performed in several phases, the scope and findings of each are described in the following sections.

3.2.1 Phase I RI Objectives

The objectives of the Phase I RI work performed in May of 2012 were to:

- Determine the nature and extent of chromium at the Plating Plant and underlying soils that may be potential sources of elevated groundwater chromium condition reported at SI well MW-6 installed outside the south side of the plant;

- Confirm the southwesterly shallow groundwater flow direction reported in DNREC's SI; and
- Determine the extent of downgradient groundwater impact, and thereby assess the potential for site-related chromium impacts to groundwater in the adjacent neighborhood where domestic wells are used as a source of potable water, by installing and sampling downgradient shallow groundwater monitoring wells.

3.2.2 Phase I RI General Scope

Phase I work (May 2012) included a soil source assessment and a shallow groundwater evaluation in which three Geoprobe™ wells were installed and groundwater samples collected and analyzed for TAL metals plus cyanide to determine the concentration of chromium in groundwater in a generally downgradient direction from SI well MW-6.

The general scope of Phase I RI work from TBE's approved Work Plan (March / April 2012) is listed below. The locations of these activities are shown on Figure 8.

- 14 soil samples were collected from seven borings drilled in the plating plant floor at the former Chrome Tank location and analyzed for total chromium;
- Soil samples containing greatest total chromium levels were analyzed by EPA 1312 (SPLP) to determine the approximate concentration of chromium in liquid leachate derived from those soils;
- Top of well casing (TOC) elevations were surveyed and depth-to-groundwater was measured to determine relative groundwater elevations in the six SI wells to confirm DNREC's reported southwesterly groundwater flow direction (before installing RI wells) to verify downgradient areas;
- The drilling and installation of three (3) shallow (20 – 30 foot deep) groundwater monitoring wells at downgradient locations;
- The collection and TAL analysis (total and filtered metals plus cyanide) of groundwater samples from the three (3) new wells plus from SI well MW-6 to determine the 2012 groundwater chromium concentration and compare 2012 MW-6 concentration to that from the 2011 SI;
- The examination, depth assessment, development and sampling of an existing onsite "deeper" well located between the two buildings, and sample analysis of TAL metals (total and dissolved) plus total cyanide.

Detailed descriptions of the work scope and findings are provided below.

3.2.3 Description and Findings, RI Phase I Source Assessment – Plant Interior Soil Evaluation

Description

To investigate possible historic releases from the former chrome tanks, TBE personnel collected RI soil samples from below the floor inside the plant in the vicinity of the former chromium tanks (shaded on Figure 8) at the locations shown on Figure 10. Holes were cored at seven locations through the 6-inch thick concrete floor slab to permit

access to the underlying soils. Photographs of the area showing the core holes and the concrete slab are found in Appendix C-1. A 4-inch nominal diameter stainless steel bucket auger was hand-driven to terminal depths ranging from 5 feet up to 8.5 feet to obtain samples of the soil. Descriptive logs for the Hand-Augered soil borings are found in Appendix C-2. Two soil samples, one shallow and one deeper, were collected from each of the seven (7) borings. Soil samples were submitted under Chain of Custody to Eurofins/Lancaster Laboratories Environmental for the analysis of total chromium.

To assess the potential for ongoing leaching of chromium from the soils below the former Chrome Tank Area, the samples with the highest reported total chromium concentration were analyzed by Eurofins/Lancaster Laboratories Environmental for the Synthetic Precipitation Leaching Procedure (SPLP) using SW 846 1312 with a ICP Digestion by SW-846 3010A. The SPLP is similar in concept and procedures to the more common Toxicity Characteristic Leaching Procedure (TCLP) conventionally used to guide proper offsite disposal of potentially hazardous materials under RCRA programs. In both the TCLP and SPLP procedures, the concentrations of target substances in a liquid leachate are determined by an acid and rotary tumbling extraction procedure; the SPLP uses nitric and sulfuric acid in water as the extraction acid to mimic the infiltration of natural, slightly acidic rainfall (pH 4.20). TCLP uses acetic acid and sodium hydroxide at a pH of 4.9 to simulate the conditions of leachate formation within a RCRA landfill.

Findings

The results of the lab analysis of total chromium in the plant interior soil samples are shown on Table 3; the Laboratory Summary Data Packages are found in Appendix C-3. The horizontal and vertical total chromium soil distribution is shown on Figure 10.

- Total chromium concentration in the shallow soil samples (0-2 feet below the slab) ranged from 11.3 to 105 mg/kg;
- Chromium concentration in the intermediate depth (3-5 feet) soil samples ranged from 2.1 to 126 mg/kg;
- Chromium concentration in the deepest soils (6.5 -8.5 ft) ranged from 11.6 to 199 mg/kg, the latter from a sample location directly adjacent to a former tank location.
- All reported soil total chromium concentrations were below DNREC's screening level / reporting level of 214 mg/kg (DNREC, July 2015).
- Chromium concentration diminished with distance from the former tank locations.

The SPLP chromium results for leachate generated using soil samples collected below the former Chrome Tanks (Figure 10) are shown in Table 4. The soil with the greatest chromium concentration (199 mg/kg) generated liquid leachate containing 245 µg/L of chromium using the SPLP protocols. Lab SPLP results typically overestimate actual leachate concentration because ideal laboratory conditions do not account for the heterogeneity and limited soil-to-extractant contact surfaces found in in-situ soils.

A comparison of the SPLP result of 245 µg/L to the MW-6 groundwater chromium concentration (approximately 1,000 µg/L) suggests that chromium was formerly present in the soil at higher concentrations than indicated in the RI samples, and that it had already migrated to the groundwater.

3.2.4 Description and Findings of the RI Phase I Groundwater Assessment

Prior to the installation of RI monitoring wells, TBE performed an independent relative survey of six SI monitoring wells to confirm the reported southwesterly groundwater flow direction (DNREC's interpretation of the groundwater direction is shown on Figure 7). Subsequently, Phase I RI wells were installed. Each effort is described below.

3.2.4.1 Determination of Shallow Groundwater Flow Direction

Description

In order to locate future RI wells in areas downgradient of the Procino Site, it was necessary to confirm the shallow groundwater flow direction prior to well installation. TBE contoured the data reported in the SI Report; the results, shown on Figure 11, indicated a southerly (to slightly southwesterly) flow direction. Although in "general" agreement with DNREC's conclusion, flow was indicated to be more southerly and less westerly than the SI Report (Figure 7). Because TBE's mapped groundwater flow direction differed from that reported by DNREC, TBE performed an April 19, 2012 field survey of the top of PVC well casing elevations at the six SI wells, measured depth-to-groundwater levels, and calculated relative groundwater elevations with the goal to optimize the siting of future RI wells downgradient from the Procino plant area.

Findings

TBE's April 19, 2012 measurement data are found on Table 2, and the calculated relative elevations are contoured on Figure 12. The measurements again indicated a shallow groundwater flow direction slightly west of due south, generally (although not precisely) in agreement with the southwest direction determined in the 2011 SI. Based upon these findings, RI monitoring wells were proposed to be installed at locations shown on Figure 8 to monitor water quality in a downgradient direction from the Procino Plating plant and MW-6.

Further, the confirmation of the south (to southwesterly) direction of shallow groundwater flow led to the finding that the pesticide dieldrin, which was detected in SI sampling in MW-1 and MW-3 and thus identified as a possible site groundwater Contaminant of Concern (COC), lay on the upgradient side of the plant. As a result of the additional groundwater flow characterization, dieldrin was found to be an upgradient or background condition not related to plant operations. Because public drinking water is provided at the Site, the onsite consumption of dieldrin in site groundwater is not a complete risk exposure pathway and further evaluation of dieldrin as a COC in the RI is not warranted.

3.2.4.2 Phase I RI Monitoring Well Installation and Sampling

Description

Three (3) groundwater monitor wells were installed on April 26, 2012 at the Procino Plating property at the locations shown on Figure 8 to total depths ranging from 23.5 to 27.5 feet below ground surface by a Delaware-licensed drilling contractor (Northeast Regional Probing, Newark, Delaware). The locations of the six (6) wells installed in the 2011 SI are also shown on Figure 8. The location of a preexisting onsite well is also shown on Figure 8; it was not in use but presumably was used to supply water to the plant prior to the provision of public water services from the Town of Blades.

The well search by DNREC's Division of Water did not contain information regarding the preexisting deeper Site well. TBE personnel conducted additional search for information about the onsite well using the archived paper files (not electronically available) of existing well logs housed at the Delaware Geological Survey (University of Delaware, Newark); the information obtained from DGS regarding the wells nearest to the Site is found in Appendix B. Based upon the DGS base map depiction of a well at the approximate Site location, TBE hypothesized that the existing deeper Site well might be the well identified as Pc34-08. The Well Log of Pc34-08 indicated the presence of several clay beds of tens of feet in thickness (18-36 feet and 41–70 feet) also seen in the logs of other surrounding wells. Information about the subsurface stratigraphic units, particularly the presence and thickness of relatively low permeability clay layers, is relevant to the potential fate and transport of contaminants in groundwater. Information about the depth and thickness of clay layers described in these well logs was summarized on Table 1.

The RI Phase I well installation program therefore had the following quality objectives:

- to provide groundwater quality assessment points (i.e., monitoring wells) at horizontal locations downgradient from the Procino facility,
- to assess whether a potential vertical chromium concentration gradient was present at increasing depths within individual wells and/or between wells installed at increasing distance from the plating plant.
- to obtain subsurface stratigraphic information from depths below the 20-foot depth of DNREC's SI wells by drilling soil borings for deeper wells, taking care not to penetrate through encountered clay layers (if any) into deeper, possibly uncontaminated, zones of the water table aquifer.

Monitoring Well Locations and Depths

The locations of the Phase I RI wells MW-7, MW-8 and MW-9 are shown on Figure 8. Originally well MW-7 was planned to be located approximately 10 feet

downgradient (southwest) of SI well MW-6, the well in which elevated chromium was detected in the SI (shown on Figure 13). However, just prior to drilling, TBE was apprised of an out-of-service Fuel Oil Underground Storage Tank in the area of the planned MW-7 soil boring/well location. As a result, MW-7 was field relocated approximately 10 feet to the east of MW-6. Wells MW-8 and MW-9 were installed at locations lying southwesterly (downgradient) from MW-6, with MW-8 to the east and MW-9 to the west.

The construction specifications of the three RI groundwater monitoring wells are presented on Table 2. Descriptive Soil Boring and Well Installation Logs for the three Phase I RI monitor wells are found in Appendix C-4. Fine-grained silt or clay layers were encountered during the drilling of the new. Each new RI well was constructed so that the base of the 20-ft section of prepacked well screen was socketed 0.5 feet into the encountered basal clay unit. Well MW-7 was drilled until clay was encountered at a depth of 27.0 feet, and the well screen was placed from 7.5 to 27.5 ft below the ground surface. MW-8 encountered clay at a depth of 23.5 feet, was drilled to a total depth of 24.0 feet and was screened from 4.0 to 24.0 ft below the ground surface. MW-9 was installed farthest to the southwest, approximately 180 feet downgradient from the plant, encountered clay at a depth of 26.5 feet, was drilled to a total depth of 27.0 feet, and was screened from 7.0 to 27.0 ft below the ground surface. During drilling, apparent groundwater was encountered at approximately 9 feet below ground surface (bgs) in MW-7, and at 7.5 feet bgs in MW-8 and MW-9.

Monitoring Well Development and Sampling

In order to evaluate the preexisting "deeper" onsite well (tentatively identified as Pc34-08), Procino Plating personnel disassembled the surface piping connecting the well with an out-of-service jet pump formerly present in the basement of the plating building. Photographs of the well are found in Appendix C-1. An approximate 20-foot section of cast iron pipe was removed from the upper section of the well (photograph, Appendix C-1). TBE personnel measured the depth to groundwater and sounded the well with a weighted tape measure to determine the bottom depth; however, the well appeared to be obstructed at a depth of 35 feet below the top of the well casing. TBE attempted to develop the well on May 1 2012 using an Inertial Pump (Watterra Hydrolift), which was not successful. A diaphragm pump capable of greater pumping rates was then obtained and used on May 3, 2012 to remove an approximate total of 500 gallons of groundwater from the deeper preexisting well with a drawdown of 12 feet pumping at a rate of 15 to 20 gallons per minute. The water was clear and odor-free. Based upon a 2010 laboratory report of a chromium concentration of 22 µg/L at this well (well below the 100 µg/L MCL), purged water was discharged to the ground surface.

TBE performed development of the three (3) new monitoring wells on May 2, 2012 using alternate periods of pumping at various rates using a peristaltic pump until the groundwater appeared visually clear. Development water was contained in 55-gallon drums pending lab analysis of the samples.

Well purging and groundwater sampling were conducted by TBE personnel at five monitoring wells and one home well on May 9, 2012 in accordance with SOPs. Field measurements of pH, temperature, conductance, oxidation-reduction potential, turbidity, and dissolved oxygen were recorded until parameter stabilization on the Groundwater Sampling Field Sheets found in Appendix C-5. To assess whether a vertical chromium concentration gradient exists in individual wells or in wells located at increasing distances from the plating plant, two (2) depth-discrete groundwater samples were collected (one from the top and one from a deeper section) of the 20-foot long screened interval from new RI monitor wells, from existing MW-6, and from the preexisting deeper onsite well. The deeper sample collected near the base of the 20-foot screened interval was analyzed for full Target Analyte List metals (total and dissolved) plus cyanide. The sample collected from the upper portion of the 20-ft screened interval was analyzed for total and dissolved chromium. Groundwater samples plus QA/QC samples were submitted under Chain of Custody to Eurofins/Lancaster Laboratories Environmental for the analyses of TAL total and dissolved metals plus total cyanides (4 samples of each) or for total and dissolved chromium (11 samples of each). The Chain of Custody form for this groundwater sampling event is found in the Lab Summary Data Package in Appendix C-6.

TBE surveyed the top of PVC well casing (TOC) elevations and measured the depth-to-groundwater levels in the three (3) new monitor wells, the onsite deep well, and the SI monitoring wells. This information was used to calculate the relative elevation of the water table surface at the Site, and from those elevations, to determine the direction of shallow groundwater flow.

Phase I RI Groundwater Findings

Table 2 summarizes groundwater depth and elevation measurements made on May 2, 2012 and May 9, 2012. The chromium and cyanide groundwater concentrations are shown on Table 5; the results of the full TAL total metals and cyanide analyses are shown on Table 6. The maximum total chromium concentration detected at each well is mapped in Figure 14. Groundwater elevation and shallow flow direction for May 9, 2012 is mapped on Figure 15. A chromium isoconcentration map of the May 2012 sample results is shown in Figure 16.

The findings of the Phase I RI groundwater assessment were:

- The soil borings drilled for the installation of the three Phase I RI wells encountered fine-grained silt or clay units in the subsurface at depths of 27 feet (MW-7), 23.5 feet (MW-8), and 26.5 feet (MW-9). This confirmed the occurrence of clay encountered at the 20-foot depth in DNREC's MW-4 and MW-6 soil borings, also reported in Peninsula Plating Site borings MW-1 and MW-3 located approximately 0.5 mile north of the Procino Site.
- The mapping of the water table elevation demonstrated a south-to-slightly southwesterly direction of shallow groundwater flow (shown on Figure 15), an orientation consistent with previous TBE measurements but more southerly and less westerly than shown in DNREC's SI (Figure 7).

- The RI re-sampling of MW-6 confirmed DNREC's SI findings of total chromium in the sample from this well at a concentration of approximately 1 milligram per liter (mg/L, parts per million). The well is located outside the plating building immediately south of the former location of the Chrome Tanks. The detected concentration exceeded the Drinking Water MCL of 100 micrograms per liter (µg/L, parts per billion). As stated previously, the Site is provided with public water; onsite groundwater is not used for any purpose.
- Within approximately 10 feet to the east of MW-6, groundwater chromium concentrations in the MW-7 samples decreased by an order of magnitude. Total chromium concentration was 78.5 µg/L in the shallow sample and slightly lower (65 µg/L) in the deeper sample, both below the 100 µg/L MCL.
- The samples from the onsite former production well contained low estimated concentrations of total chromium; 7.4 (J) µg/L at 35 feet and 5.9 (J) µg/L in the 12-foot deep sample, not indicative of vertical chromium migration. Dissolved chromium was not detected in either shallow or deep samples collected at MW-7.
- The MW-8 groundwater samples contained low concentrations of total chromium; 24.8 µg/L in the 23-foot deep sample and 20.7 µg/L in the shallower 9.5-foot sample, both below the 100 µg/L MCL. These results indicate that chromium has migrated downgradient approximately 150 feet from the MW-6 area, but does not exceed drinking water standards.
- Chromium was not detected in the groundwater samples from MW-9, located approximately 50 feet west of MW-8 and in between the Procino Site and the domestic wells. This result supports the southern groundwater flow direction (rather than southwestern), which is not towards the home well neighborhood.
- Total chromium concentration had decreased in the home well sample from a 2011 concentration of 24.2 µg/L to a 2012 concentration of 15.5 µg/L.
- The property to the south of the Site downgradient of MW-8 is not currently developed, has no potable water wells installed, and is located within the Town of Blades public water service area.

RI Phase I well sampling results are summarized on Figure 16. Groundwater total chromium concentration exceeded the EPA Drinking Water MCL in one well, MW-6, located on the Procino Plating property directly outside the plating plant. Samples from wells lying to the east and to the west contained significantly lesser chromium concentrations than the MW-6 sample. Chromium was not detected in the groundwater collected from the westernmost well MW-9, located between the plant and the nearby neighborhood. The groundwater flow direction mapping shown on Figure 15 and the chromium concentration isocontours shown on Figure 16 indicate a slightly more southerly flow direction than indicated in the SI. The homes using well water lie generally farther west than the indicated direction of groundwater flow depicted on Figure 15 and Figure 16. Homes to the south of the Procino property are within the Town of Blades limits, and are

connected to public water rather than using groundwater for their potable supply. Site-specific drilling confirmed the occurrence of subsurface fine-grained beds in all three RI well borings, also seen in two SI wells and two Peninsula Plating Site wells. Although not continuous, the fine-grained materials will generally create zones of lower permeability which impede the vertical migration of groundwater.

3.3 Phase II RI (2013) – Expanded Groundwater Evaluation

A ***Preliminary Data Assessment*** report summarizing Phase I activities and findings was prepared by TBE and submitted to DNREC in October of 2012. A project meeting was held with DNREC SIRS, Procino Plating, and TBE personnel on November 16, 2012, to discuss the Phase I findings. At that meeting, DNREC stated that additional groundwater evaluation was required to further determine the downgradient extent and vertical extent of chromium in the groundwater.

Phase II RI planning and scoping commenced, a draft Work Plan was submitted on December 5, 2012, which after DNREC comments and TBE revision, was approved on March 12, 2013. Subcontractor procurement and offsite property access approvals were performed by TBE in April of 2013, with field work installing and sampling the Phase II RI wells performed in May of 2013.

3.3.1 Phase II RI Objectives

The objectives of the Phase II RI work (May 2013) were:

- to determine the current (2013) concentration of chromium in groundwater in the Phase I RI wells and its horizontal distribution in shallow RI Phase II wells to be installed southeast and south of the Phase I wells, and
- to evaluate the deeper stratigraphy below the depth of 29 feet sampled in the Phase I RI to determine the thickness and extent of fine-grained silt or clay layers especially between the Site and the neighborhood using wells; clay layers of tens of feet in thickness were reported on drillers' well logs of well Pc 34-01 through Pc 34-08 obtained from the DGS files (see Appendix B); and
- to characterize the water quality in the deeper portion of the aquifer lying below the first clay layers (if present) in the area between the Procino Property and the neighborhood located to the west-southwest where domestic wells are in use.

3.3.2 Phase II RI General Scope

The general scope of Phase II RI work was designed to attain the above objectives, was contained in TBE's approved Work Plan and is summarized below. The locations of Phase II wells are shown on Figure 17. The scope included:

- The drilling and installation of three (3) downgradient shallow (20 – 30 ft deep) groundwater monitoring wells by which to determine the chromium concentrations in shallow groundwater east and south of the chromium-impacted shallow wells;

- The collection of 3 groundwater samples from the new shallow Phase II wells and their analysis for total chromium;
- The re-sampling of shallow wells MW-6, MW-7, MW-8, and MW-9 to assess possible changes in shallow groundwater chromium concentration over the 1-year period since the May 2012 samples;
- The collection of two depth-discrete groundwater samples from the above seven (7) wells to assess the potential for a vertical chromium concentration gradient within individual wells and/or between wells at increasing distances from the plating plant;
- The drilling and installation of two (2) deeper double-cased hollow-stem auger wells at locations between the Procino Property and the westerly neighborhood.
- Continuous split-spoon sampling during the drilling of the deeper wells to evaluate the stratigraphy below the 24-27.5 foot total depths of Phase I RI well depths and to describe the occurrence, thickness and depth of fine-grained layers (if any);
- Groundwater sampling of the deeper wells for total chromium to determine its presence and concentration in the Columbia aquifer below the first clay; and
- The re-sampling of the shallowest SI home well (8140 First Street) for analysis of total chromium and cyanide to assess concentration changes over the year elapsed since the 2012 sample.

Detailed descriptions of the work scope and findings are provided below.

3.3.3 Description and Findings of the Phase II RI Groundwater Evaluation

The 2013 Phase II RI groundwater evaluation consisted of additional shallow Geoprobe™ well installation and sampling as described in the section below. Two deeper wells were also installed in 2013 by a separate drilling contractor, as described in the section following.

3.3.3.1 Phase II Shallow Monitoring Well Program

Shallow Well Locations and Depths

Three direct push soil borings were drilled to depths ranging from 24 to 28 feet on May 7, 2013 by Northeast Regional Probing, a Delaware-licensed drilling contractor. All three were completed as shallow groundwater monitoring wells (designated MW-10, MW-11 and MW-12) at the locations shown on Figure 17. Well MW-10 was situated to assess the eastern margin of the shallow groundwater plume. Wells MW-11 and MW-12 were situated to determine the chromium concentration downgradient (south-southwest) of the Phase I wells.

The Phase II RI shallow wells were constructed in the same manner (by Geoprobe™) and with the same construction specifications as the May 2012 Phase I wells; the construction specifications of the Phase II groundwater monitor wells are found on Table 2. Photographs of the well installation are found in Appendix D-1. The encountered conditions and materials are found on Soil Boring / Well Installation Logs in Appendix D-2.

As encountered during drilling of the Phase I RI shallow wells and described on the drilling logs from preexisting local wells, silt and/or clay layers were encountered in the subsurface at depths below 20 feet. A clay layer was encountered at a depth of 22.5 feet in MW-10, a depth of 25.0 feet in MW-11, and at 23.7 feet depth in MW-12. Each well was constructed so that the base of the 20-ft section of prepacked well screen was socketed into the clay at the base of the soil boring. Apparent groundwater was encountered at approximately 7 feet below ground surface (bgs) in MW-10, and at 6 feet bgs in MW-11 and MW-12.

Shallow Well Development, Survey, and Sampling

TBE personnel developed the Phase II shallow monitor wells MW-10, MW-11, and MW-12 on May 9, 2013 using alternate periods of pumping at various rates using a peristaltic pump until the groundwater appeared visually clear. TBE personnel also surveyed the top of PVC well casing (TOC) elevations at the new wells relative to the existing wells and measured the depth-to-groundwater levels in all of the RI wells to be sampled. This information was used to calculate the relative elevation of the water table surface at the Site, and from those elevations, to determine the direction of shallow groundwater flow.

Groundwater samples were collected from seven shallow wells on May 16, 2013 for lab analysis. Groundwater was purged until field parameters were stable, as recorded on the field purging / Sampling Field Sheets in Appendix D-3. As in the prior RI sampling, two (2) depth-discrete groundwater samples were collected to assess the potential for a vertical chromium concentration gradient, one from the top and the second from near the base of the 20-foot long screened interval at each of the three new shallow monitor wells and from the Phase I RI wells (MW-7, 8, 9) and DNREC's SI well MW-6. These 14 groundwater samples plus QA/QC samples were submitted under Chain of Custody to Eurofins/Lancaster Laboratories Environmental for the analyses of total chromium. The Chain of Custody form for this groundwater sampling event is found with the Lab Summary Data Package in Appendix D-4.

Findings - Phase II Shallow Well Installation/ Groundwater Sampling

The laboratory results of the 2013 RI analysis of shallow well samples MW-6 through MW-12 for chromium are shown on Table 5 along with previous sampling results. The maximum total chromium concentration reported at each well is mapped in Figure 18. Groundwater depth and elevation measurements made on May 9, 2013 are shown on Table 2 and mapped on Figure 19. The findings of the 2013 Phase II RI shallow groundwater assessment are summarized on the chromium isoconcentration map shown as Figure 20.

- As encountered in the drilling of the 2012 RI soil borings, the new Geoprobe™ borings encountered fine-grained sediments in the subsurface at depths of 22.5 feet (MW-10), 25 feet (MW-11), and 23.7 feet (MW-12).

- The contour mapping of the water table elevation demonstrated a southerly direction of shallow groundwater flow as shown on Figure 19; this orientation is more to the south and less to the west than that measured previously.
- The MW-6 chromium concentration of 319 µg/L was significantly less than the 1,170 µg/L reported one year prior (May 2012); although still above the 100 µg/L MCL, Site groundwater is not used for drinking water.
- The groundwater chromium concentration decreased laterally from MW-6 to MW-7 approximately 10 feet away, with reported MW-7 concentrations of 60.7 µg/L (shallow) and 82 µg/L in the deeper sample, both below the MCL.
- The sample from new shallow well MW-10, located southeast of MW-6, was reported to contain a total chromium concentration of 193 µg/L, above the MCL. This water quality data supports the groundwater elevation data in indicating a southward direction of groundwater flow, rather than southwest or west towards the homes using domestic wells.
- The sample from new shallow well MW-11 contained total chromium at a low estimated level of 6 (J) µg/L.
- Chromium was not detected in the MW-8 sample. The May 2012 MW-8 concentrations were 20.5 µg/L (shallow sample) and 23.7 µg/L in the deeper sample. This finding indicates either plume migration to the east or attenuation of the plume size on its western margin.
- As in both 2012 MW-9 samples, chromium was not detected in either of the MW-9 samples.
- Chromium was not detected in either sample from new RI well MW-12, the westernmost well located nearest to the neighborhood on private wells.
- The downgradient plume boundary does not extend to or approach areas of groundwater discharge to the surface water bodies. Morgan Branch lies at a distance of 1,100 feet to the south of the MW-6, while the southernmost plume boundary (approximately MW-11) lies at a distance of approximately 200 feet (see Figure 21). The Nanticoke River is even farther from the Site, about 1,300 feet west.

The shallow groundwater flow direction mapped from the 2013 Phase II elevations shown on Figure 19 indicated a somewhat more "southerly" flow direction than had been previously indicated. The elevation of the water table surface was essentially equivalent in MW-3 and MW-4 to the north of the plating building, and again to the south side of the building between MW-6/MW-7 and MW-2 to the west. The perpendicular groundwater flow direction as indicated by these equipotential lines is almost due south. The neighborhood homes using domestic well water lie farther west than the southerly direction of groundwater flow indicated in the May 2013 data on Figure 19, also seen in the May 2012 data mapped previously on Figure 15.

The findings of the Phase II RI shallow groundwater assessment are summarized on the chromium isoconcentration map shown in Figure 20. Two shallow groundwater samples

contained chromium at concentrations above the EPA Drinking Water MCL; again the onsite well sample from MW-6, and the new Phase II well MW-10 located approximately 60 feet southeast of MW-6. Chromium was not detected in shallow or deeper samples collected from wells MW-8, MW-9 and MW-12 which are located to the west between the Procino Plating plant and the nearby neighborhood.

The 2013 RI drilling expanded the area known to contain subsurface fine-grained beds from the two SI wells (MW-4 and MW-6) and three Phase I wells (MW-7, -8, and -9) to also include all three shallow Phase II wells MW-10, -11, and -12. Although encountered at variable depths and therefore not continuous, the lower permeability of these fine-grained interbeds impede the vertical migration of groundwater within the unconfined aquifer.

3.3.3.2 Description and Findings, RI Phase II - Deeper Monitor Well Installation and Sampling

Description

At DNREC's request, two deeper monitoring wells (DMW) were installed in May 2013 to form nested well pairs with shallow RI wells MW-8 and MW-9 (see Figure 17) to enable the measurement of the vertical hydrologic gradient in the vicinity. DMW-1 and DMW-2 were also laterally situated to serve as downgradient sentry wells for the homes on domestic wells.

Well Drilling and Construction

To prevent the downward migration of potentially chromium-containing shallow ground water during drilling, the two deeper wells were constructed as double-cased Hollow Stem Auger wells. Photographs of the deep well installation are found in Appendix D-1. A 12-inch diameter auger boring was advanced to a depth of 20 feet, a depth above the 27 feet at which clay was encountered in the MW-8 and MW-9 borings. Continuous split-spoon sampling collected subsurface soil from 20 feet to encountering the contact with subsurface clay layers. A 6-inch threaded flush joint PVC casing was installed through the augers from the ground surface to the contact with the clay, and grouted in place. After the grout had set, the borehole was drilled inside the surface cased section, and advanced by 2-foot increments using continuous 2-ft split-spoon sampling followed by mud rotary drilling in order to permit the descriptive logging of the geologic units lying below the top of the first encountered clay to determine the thickness of the clay and determine the depth at which underlying granular materials were encountered. A well was installed to monitor water quality in the sandy zone under the clay.

The monitor wells were constructed using a 10-foot long section of threaded flush joint 2-inch diameter PVC 10-slot screen and a No.1 sand filter pack. Above the screen and extending above grade, the wells were constructed of threaded flush joint 2-inch diameter solid PVC casing, which was grouted into the annular space above the filter pack. The wells were completed flush-to-grade with cement grout. Well specifications are found on Table 2.

Well Depth

The actual terminal drilling depth and depth of the screened interval were determined in the field on the basis of conditions encountered during the drilling. An apparent clay layer was encountered in DMW-1 from 29.9 feet to 33.5 feet, underlain by sands to a depth of approximately 46 feet, where a second apparent clay unit was encountered. The well screen was therefore placed from 34 to 44 feet deep to monitor the sandy zone below the first encountered apparent clay. In DMW-2, fine-grained apparent clay extended from 25 feet to 33.6 feet, below which sands were encountered down to 42.2 feet. The screen was therefore placed from 33 to 43 feet to monitor the sandy zone below the clay unit.

Two wells were approved in the Work Plan with a third deep well as a contingency if variability was observed in the subsurface stratigraphy during the installation of DMW-1 as compared to DMW-2. Because the subsurface conditions were comparable, the third deep well was not installed.

Well Surveying and Development

After installation, wells DMW-1 and DMW-2 were developed by the well drillers using airlift techniques to remove fine particulates from the well screens. Development water from the Phase II wells was contained in 55-gallon drums which were staged in the plating plant pending the results of the groundwater sample lab analyses. Ten Bears Environmental personnel conducted a relative elevation survey of the top of the PVC well casings which was tied to the existing well casing elevation data.

Well Sampling

Depth-to-groundwater was measured prior to collecting groundwater samples from the five new RI (2013) wells, the three 2012 RI wells MW-7, MW-8 and MW-9, and DNREC's SI well MW-6 using EPA Low-Flow methods on May 16, 2013. The wells were purged prior to sample collection in accordance with EPA's low-flow protocol; the measurements of field parameters are found on the Groundwater Sampling Field Data Sheets in Appendix D-3. The seven shallow Geoprobe™ wells were sampled for total chromium from two depths, the top and just above the base of the 20-foot screened interval. The two deeper wells were sampled for total chromium and total cyanides from one depth at the approximate middle of the 10-foot screened interval. Groundwater samples plus QA/QC samples were submitted under Chain of Custody to Eurofins/Lancaster Laboratories Environmental. The Chain of Custody form for the May 2013 RI groundwater sampling event is found with the Lab Summary Data Package in Appendix D-4.

Re-Sampling of a SI Residential Well

A second RI sample was collected from the SI home well (it was sampled in the 2012 RI as well) which was analyzed for total chromium and total cyanide. The well was purged prior to sample collection; the Field Data Sheet is found in Appendix D-3 and the sample Chain of Custody and Data Summary Report are found in Appendix D-4.

Findings - RI Phase II Deep Well Installation/ Groundwater Sampling

The laboratory results of the deeper well samples DMW-1, DMW-2 and the re-sampling for home well #8 (Wingate) are shown on Table 5 with previous sampling results. The maximum total chromium concentration detected at each well has been mapped on Figure 18. Groundwater depth and elevation measurements made on May 9, 2013 are shown on Table 2 and mapped on Figure 19. A 2013 chromium isoconcentration map is shown as Figure 20.

- Fine-grained silt and/or clay beds were encountered in the drilling of DMW-1 and DMW-2. A 3.6-foot thick clay layer was penetrated in DMW-1 from 29.9 to 33.5 feet, with a deeper clay bed encountered at the termination depth of 46 feet. In DMW-2, an 8.6-foot thick clay unit was penetrated from 25 to 33.6 feet.
- The 2013 re-sampling of the SI home well (Wingate or 8140 First Street) showed continued reduction in chromium concentration (11.5 μg/L) from the level of 15.5 μg/L in May 2012 by the Office of Drinking Water, and 50% of the 24.2 μg/L concentration reported in the 2011 SI. All reported chromium concentrations at home well #8 were well below the drinking water MCL of 100 μg/L.
- The 2013 Wingate well re-sampling also showed a reduction of over 50% in cyanide concentration (8.8 μg/L) from that measured in DNREC's SI sampling two years ago (20.0 μg/L). The 2012 cyanide sample was reported as "less than 50 μg/L". All measured cyanide concentrations have been well below the 200 μg/L MCL for cyanide.
- The DMW-1 and DMW-2 samples contained low chromium concentrations reported as 1.1 (J) and 4.1 (J) μg/L, respectively; the laboratory-assigned "J" qualifier indicates concentrations above the lab Method Detection Limit but below the lab Quantitation Limit, which should be considered as "estimated."
- A downward vertical hydraulic gradient was measured in both nested well pairs. An elevation difference of 2.69 feet was seen between shallow MW-8 (20.235 ft) and deep DMW-1 (17.54). Between shallow MW-9 (19.65) and deep DMW-2 (17.47) the elevation difference was slightly less, at 2.18 feet. The more than two feet of difference in water elevations indicates that the fine-grained subsurface layers encountered above the screened intervals in the deeper wells are providing hydrologic separation between the shallowest and the underlying water-bearing zones although all are parts of the unconfined to semiconfined Columbia aquifer.

Information from Phases I and II of the RI was compiled and submitted to DNREC in a draft Remedial Investigation Report (TBE, August 2013). It was concluded that because public water was provided to properties located downgradient of the Site plume, no complete exposure pathway existed for the ingestion of plume groundwater containing (in some portions) chromium at a concentration above the MCL.

3.4 Phase III RI (2014) – Updated Groundwater Evaluation

DNREC's April 2014 letter in review of the 2013 draft RI Report required additional delineation of groundwater chromium to the east-southeast of well MW-10 from which the

2013 sample chromium concentration (193 μg/L) exceeded the 100 μg/L MCL. DNREC further stated that the Site location within the delineated Wellhead Water Resource Protection Area for the Town of Blades' public wells constituted a "de facto" complete groundwater ingestion pathway which required further assessment of possible groundwater ingestion risks from the chromium plume.

3.4.1 Phase III 2014 RI Objectives

In response to DNREC's letter of April 2014, a Phase III RI scope of work was developed with the following objectives:

- Determine the 2014 groundwater chromium concentrations present in samples from SI wells and RI wells to characterize current (May 2014) horizontal plume distribution and rate of attenuation since 2013 sampling;
- Collect current depth–to-groundwater measurements to assess the 2014 shallow groundwater flow direction;
- If the 2014 MW-10 sample chromium concentration exceeded the MCL, to begin the process of parcel owner identification and procurement of access agreements at properties located southeast and south of MW-10 for additional RI wells;
- If warranted based upon the results of the 2014 chromium analyses, to install additional shallow and deep groundwater monitoring wells in a downgradient (generally southerly) direction and collect samples from them to measure the concentration of chromium in groundwater.

3.4.2 Phase III 2014 RI Scope

Nearly a year elapsed between the May 2013 RI groundwater sampling event and the issuance of DNREC's April 2014 letter requiring additional RI groundwater evaluation. Because a relatively rapid attenuation in chromium concentration was observed between the 2011 SI results and the 2012 RI results (see Table 2) and between the May 2012 and the May 2013 results, the initial Phase III (2014) RI effort was to resample the RI well network in order to quantify 2014 chromium distribution, assess the need for further delineation, and assess the rate of contaminant attenuation. Groundwater depth was measured at each sampled well and evaluated to determine the direction of shallow groundwater flow.

Groundwater samples were collected on May 29, 2014 from 15 existing SI and RI wells (shown on Figures 19 and 20) to quantify chromium and cyanide concentration distributions and to obtain depth-to-groundwater measurements. Wells evaluated included seven (7) wells sampled in DNREC's Site Inspection (MW-1 through MW-6 and the domestic Wingate well); six (6) shallow RI wells (MW-7 through MW-12); and two deeper RI wells DMW-1 and DMW-2.

Groundwater samples were collected per DNREC groundwater sampling SOPs using EPA's Low Flow methodology, including the collection of field parameters until stabilization was attained. Field purging measurements are found on Groundwater

Sampling Field Sheets (GSFS) in Appendix E. The 15 groundwater samples and QA/QC samples were submitted to Eurofins Lancaster Laboratories Environmental Inc. for analyses of chromium ant total cyanide.

3.4.3 Findings of RI Phase III Groundwater Sampling (May 2014)

The results of the laboratory analysis of the 15 groundwater samples collected in the May 2014 event are summarized on Table 5 and mapped on Figure 21. The Laboratory Summary Data Report is found in Appendix E. Cyanide was not detected in any of the 15 groundwater samples collected and analyzed in 2014, including the sample from the home well (Wingate) where cyanide was detected at decreasing concentrations since 2011. Chromium plume concentrations in 2014 (Figure 21) decreased at all wells other than MW-7. Chromium concentration exceeded the MCL in samples from MW-6 (222 µg/L), adjacent MW-7 (129 µg/L), and MW-10 (139 µg/L) located approximately 100 feet south of MW-7. Chromium was not detected above the laboratory detection limit in 10 of 15 samples collected in the 2014 event.

The measured depth to groundwater on the date of sample collection was recorded on the Groundwater Sampling Field Sheets and summarized on Table 2 which shows water depths converted to relative elevations. Groundwater elevations were plotted (Figure 21) and contoured as a potentiometric surface map to depict the direction of shallow groundwater flow. Relative 2014 groundwater elevations were consistent with five previous RI events and the SI in depicting a southerly direction of shallow groundwater flow, also reflected by the detection of chromium in MW-10 located south of MW-6.

3.5 Phase IV RI (2015) - Groundwater Evaluation

The May 2014 groundwater data showed that groundwater chromium concentration, although continuing to diminish over 2011 to early 2014, remained above the 100 µg/L MCL in the easternmost (MW-7) and southeastern MW-10 samples. DNREC required further evaluation of groundwater to delineate the eastern and southeastern extent of the chromium plume.

3.5.1 Phase IV 2015 RI Objectives

The objectives of the RI groundwater assessment performed in 2015 were to.

- Determine the 2015 groundwater chromium concentrations present in samples from selected SI and RI wells to characterize the current (May 2015) horizontal plume distribution and rate of attenuation since the 2014 sampling;
- Collect current depth–to-groundwater measurements to assess the 2015 shallow groundwater flow direction;
- Install and sample additional wells with which to delineate the eastern and southeastern extent of the chromium plume.

3.5.2 Scope of 2015 RI - Well Installation and Groundwater Sampling

After a fall-winter 2014 property access negotiation period, permission was obtained and four new RI wells were drilled and installed in early 2015 on properties to the east and southeast of the Procino Site. Three shallow wells (MW-13, MW-14, and MW-15) and one deeper well (DMW-3) were installed in late April of 2015 at locations shown on Figure 22. Soil Boring logs from the drilling of the new RI 2015 wells are found in Appendix F, along with copies of the DNREC Well Completion Forms.

Groundwater samples were collected on May 14, 2015 using EPA's Low Flow protocol, per DNREC groundwater sampling SOPs and the approved Sampling and Analysis Plan, from nine (9) wells including the four new RI wells and five existing SI or RI wells. Depth to groundwater and field groundwater parameters were measured during well purging until stabilization was attained; measurements are found on Groundwater Sampling Field Sheets (GSFS) in Appendix F. SI wells other than MW-6 and RI wells in which chromium was previously not detected (the preexisting onsite well, MW-9, MW-12, DMW-1, and DMW-2) were not resampled. Depth to groundwater measurements were converted to relative elevations; data are shown on Table 2. The groundwater samples were submitted under Chain of Custody to Eurofins Lancaster Laboratories Environmental Inc. for analysis of dissolved chromium.

3.5.3 Findings of RI Phase IV Groundwater Sampling (May 2015)

Mapping of relative groundwater elevations again showed groundwater flow in a direction slightly west of due south, as illustrated on Figure 23. This direction is south and east of the home wells located in the neighborhood to the west-southwest of the Site.

Chromium concentrations reported for the 2015 groundwater samples are listed on Table 5 and mapped on Figure 24; the 2015 Laboratory Data Report is found in Appendix F. May 2015 groundwater results showed consistent decreases in chromium levels in all samples, and concentrations below the MCL in all samples other than MW-6. The chromium concentration in the MW-6 sample (115 µg/L) was slightly above the 100 µg/L chromium MCL, although diminished by nearly 90% to a level approximately 10% of the 959 µg/L concentration reported in the SI. Chromium concentrations in samples from all wells located off of the Procino Site were below the drinking water MCL.

These data show the continuation of the decreasing chromium trend reported in the 2013 draft RI Report, presumably resulting from of the cessation of the former chrome tank release to soil, a reduction in chromium migrating from soil to groundwater, and the resulting attenuation of the size and concentration of the chromium plume.

4.0 INTERIM ACTION - SOIL SOURCE DELINEATION AND REMOVAL

Procino Plating, with planning and field monitoring by Ten Bears Environmental and DNREC oversight, performed an Interim Action (IA) Soil Source Removal to remove chromium-contaminated soils presumed to be the source of the groundwater chromium plume from an area

below the floor inside the Procino Plating facility. The soil removal was performed in accordance with the procedures specified in a draft Interim Action Work Plan (IAWP), revised based upon DNREC's comments of March 31, 2015, with a Sampling & Analysis Plan and a Site-specific Health & Safety Plan (TBE, May 2015) approved by DNREC on May 19, 2015.

4.1 Interim Action Objectives

The qualitative Remedial Action Objective (RAO) of the IA Soil Removal was to remove chromium-contaminated soils inside the building to the extent practicable without compromising the building foundation. DNREC's total chromium soil Screening Level of 214 mg/kg represented the target quantitative RAO. However, the horizontal extent of the Excavation Area was limited by the approximate 15-foot width of the building, and the excavation depth was limited by the need to avoid undermining nearby building foundation footings. Therefore, actual soil removal depth was dictated by site conditions rather than a goal of complete soil removal to a specified soil concentration (RAO). This was explicit in the DNREC-approved Work Plan.

4.2 Interim Action – Scope, Description, and Findings

The locations sampled in the prior (2012) soil delineation effort did not indicate the presence of soil chromium at a concentration above DNREC's Screening Level (described in Section 3.2 and shown as Figure 10). However, the chromium concentrations in groundwater samples from wells MW-6 and MW-7 outside (south of) the plating building indicated a soil source was likely present in the immediate well vicinity. Therefore, a second soil sampling event was conducted in 2015 at regular intervals and a closer grid spacing to search for, and delineate the horizontal and vertical extent of, soil containing chromium at a concentration above 214 mg/kg. The 2015 soil sampling effort and scope of the Interim Removal Action are described in the following.

1. Concrete Slab Removal

   Based on our discussions with the owners, the concrete floor slab had been poured on top of clean soil backfill in approximately 1999 when the former chrome tank was taken out of service. The 2012 soil sample results (see Figure 25) from 0-2 feet directly below the slab showed total chromium to range from 11.3 mg/kg to 105 mg/kg, all below DNREC's chromium soil screening level of 214 mg/kg, therefore, some of these samples likely were collected from backfilled soil. Following DNREC approval of the IA Work Plan, OSHA-trained Procino Plating personnel jackhammered and removed the existing concrete floor slab from the Excavation Area shown on Figure 25. Concrete rubble from the slab demolition and the clean underlying soils were stockpiled for reuse as backfill.

2. Pre-Excavation Soil Sampling - Chromium Delineation

   Once the concrete slab was removed allowing access to the subsurface, a grid of nine (9) hand-augered soil borings was performed at the locations shown on Figure 26 to permit the collection of subsurface soil samples for laboratory analyses in order to delineate the dimensions of the proposed Excavation Area. Continuous soil sampling was performed to a depth of approximately 8.5 feet where groundwater was encountered, therefore deeper sampling was prevented by soil caving. Soil samples were submitted to Eurofins Laboratory for total chromium analysis. The soil sample total chromium results, shown

on Table 7 indicated the horizontal and vertical distribution of chromium above the screening level, delineating the planned Excavation Area.

Laboratory analyses were also required to characterize the specific soil proposed for 2015 excavation and off-site disposal. The 2015 soil samples with highest reported chromium concentrations were composited to create a large sample representative of the materials that would likely require offsite disposal; this sample was split into three replicate samples which were submitted to Eurofins Laboratory for analysis of disposal characterization parameters including full Target Compound List (TCL) organic compounds, full Target Analyte List metals and cyanide, RCRA characteristics (pH, ignitability, corrosivity, and reactivity), Toxicity Characteristic Leaching Procedure (TCLP), and Total Petroleum Hydrocarbons (TPH) for review by disposal facilities. The Laboratory Report of the disposal characterization analyses is found in Appendix G.

3. Excavation of Chromium-Impacted Soil

Using the results of the 2015 subsurface soil sampling effort, soils containing chromium at a concentration above DNREC's total chromium screening level (214 mg/kg) were removed to the extent practicable without compromising the building foundation. During excavation, chromium-impacted soils above the RAO based on the 2015 delineation soil sampling results as well as visually stained concrete debris from the former tank vault were placed into a 17 cubic yard roll-off for later transport by Low Country Environmental (Walterboro, SC) for disposal at Envirite EQ of Pennsylvania (York, PA). Photographs of the soil removal are in Appendix G.

Area of the Excavation: The 2015 soil sample results on Table 7 indicated that the Excavation Area would extend approximately 10 feet long and 10 feet wide at the surface, as shown on Figure 26. The vicinity of the proposed excavation is shown on the photographs. Note the surrounding elevated wooden bulkheads.

Excavation Method: The subslab soil and the concrete block from a former block "vault" surrounding the subsurface portion of the former chrome tank were removed using a small Bobcat excavator. Excavated materials were placed on a conveyor system which emptied into a cart. Once filled, the cart was wheeled to a roll-off container located exterior of the building (see photographs in Appendix G).

Excavation Depth: The excavation depth based upon the soil sample results was approximately 8 feet in the area of SB-1 and SB-5, and approximately 6 feet in surrounding areas. The excavation sidewalls were benched inward to avoid destabilizing building foundations as well as to meet OSHA requirements for excavation entry, maintaining an approximate "1 to 1" slope. Figures 27, 28, and 29 depict the target excavation depths for each of the nine grid cells.

Estimated Excavation Volume: Initial assumptions of an average excavation area of 10 feet square (100 square feet) and a depth of 6 feet resulted in a calculated excavation volume of 600 cubic feet (20 cubic yards) of material to be excavated, some portion of which was used to backfill the excavation as described below.

Staging of Excavated Materials: The 2012 and 2015 soil sample results were used to guide the segregation and staging of excavated material. Figures 27, 28, and 29 depict the strategy employed to stockpile excavated material. Removal of shallow soil having chromium levels below the 214 mg/kg RAO was needed in order to access underlying contaminated soils; those soils were stockpiled then backfilled into the excavation.

4. Collection of Post-Excavation Samples

Following excavation of each grid to the target depth, one post-excavation grab soil sample was collected using the backhoe bucket from the loose material at the approximate bottom of each of the nine (9) grid cells, and was submitted for laboratory analysis to document the concentration of chromium remaining in place on the site. The locations and depths of the post-excavation samples are shown in Figures 27, 28, and 29. Post-excavation soil sample results are shown on Table 8. It was stated in the DNREC-approved IA Work Plan that it was considered likely that some post-excavation soil samples may exceed the 214 mg/kg RAO; this occurred in two (2) of the seven (7) post-excavation soil sample results. However, further excavation is not practicable without compromising the integrity and bearing capacity of the soils underlying the foundations. The Interim Action goal was to remove the maximum soil volume practicable.

5. Installation of PVC Piping for Optional Future Groundwater Treatment

The IAWP scope included an initial application of a groundwater metals treatment (EHC-M©) into the open excavation. EHC-M©, developed by the Adventus Group, is a controlled release carbon and zero-valent iron technology for in-situ chemical reduction which encourages precipitation and adsorption to soil of dissolved metals in groundwater. However, due to logistical difficulties in obtaining the product at the time of the fast-track schedule of the Soil Removal, the EHC-M© was not applied into the open excavation. However, a PVC piping system was installed per the IAWP to permit future access to the subsurface Excavation Area. A six-foot length of perforated 4-inch diameter PVC pipe was installed within a 12-inch stone bed at an approximate 6-foot depth at the bottom of the excavation. The horizontal pipe run was joined to a solid PVC riser pipe, which was extended to the ground surface and capped. Photographs of the PVC piping system are found with the Interim Action photographs in Appendix G.

6. Backfill of the Excavation

The Excavation Area was backfilled above the PVC pipe and stone layer using stockpiled excavated soil with chromium levels below the RAO (per 2012 and 2015 laboratory analysis), which was compacted to the extent practicable using the bucket as it was placed, taking care not to damage the PVC riser pipe. Clean concrete rubble from the demolition of the slab was then backfilled. Remaining excavation space was backfilled to grade with virgin crushed rock and bagged sand, chosen because they are clean virgin rock material free of contaminants that could potentially be present in fill soils obtained from another location, and further, will provide a dense, compactable subgrade upon which a new floor can be constructed. Photographs of the completed backfilled excavation are found in the Interim Action photographs in Appendix G.

7. Replacement of the Concrete Floor Slab

   Procino Plating restored the Excavation Area by performing a cleanup of all soil from the surrounding area, and replacing the concrete floor slab in the interior of the building. Photographs of the completed concrete-capped Excavation Area are shown on the Interim Action photographs in Appendix G.

8. Offsite Disposal of Chromium-Impacted Soil and Debris

   Using the results of the disposal characterization soil samples (Appendix G), TBE and the site owners identified a Transport & Disposal (T&D) facility (Envirite / EQ of Pennsylvania, York PA) to transport the rolloff containing the chromium-containing soils and visibly stained "vault" concrete block rubble for disposed at an offsite facility. The soil transport manifest, weight ticket, and Certificate of Disposal were obtained from the T&D facility, and are found in Appendix G.

5.0 GROUNDWATER CONTAMINANT FATE AND TRANSPORT

The following section provides information about chromium, the sole Procino Plating Site COC, including its likely mechanism of release at the Site and fate and transport characteristics of chromium and of the Site environment which together control its distribution in soil and groundwater. The extent to which chromium will be transported in the environment from the source area is influenced by the properties of the contaminant itself (state, density, solubility, etc.) as well as the properties of the subsurface soil and aquifer materials such as organic carbon, grain size, porosity, permeability, hydraulic conductivity, and transmissivity. Many interactive geochemical processes between the contaminant and the environment influence the occurrence and concentration of chromium released into the environment, including sorption and transformation between chromium species.

5.1 Chromium Properties

Chromium is a heavy (density of 7.14) metallic element which occurs in a range of oxidation states (species) from -II to +VI, with the trivalent (III) and the hexavalent (VI) the most prevalent. Elemental chromium (chromium 0) does not occur naturally. Although a divalent state exists, chromium II (also known as "chromous") is unstable under normal environmental conditions and readily oxidizes to the trivalent (III or chromic) state. Chromium compounds are most stable in the trivalent state under typical environmental conditions and occur naturally in ores such as ferrochromite (FeCr2O4). The hexavalent (VI or chromate) state is the second most stable state; however, it only occurs naturally in rare minerals such as crocoite (PbCrO4). Hexavalent chromium compounds primarily arise from anthropogenic sources (ATSDR, see Appendix H).

5.2 Chromium Source Area

Chrome, along with nickel and copper, was used in the onsite plating operations at the Procino Plating Site. Chrome was formerly stored in two tanks inside the plant adjacent

to the exterior location of well MW-6 (see Figures 8 and 10). Prior to approximately 1999, this area had a wooden floor overlying a soil-covered crawlspace. It is presumed that spillage or leakage of the chrome-plating solutions from the tanks or during tank operations, and subsequent leakage between the planks of the wood flooring was the primary source of the chromium detected in the soil samples collected below the former tank locations. Chromium was detected in 2012 soil samples at concentrations ranging from 2 mg/kg (parts per million) up to 199 mg/kg, with most samples in the 20 to 50 mg/kg range (shown on Figure 10). Although infiltration of precipitation through the impacted soil was restricted by the plant roof and wood floor and later a concrete slab, chromium released to the soil apparently migrated from the surface soil downward to deeper soil under density and gravity, ultimately reaching soil below the water table where portions of chromium were able to be transported by groundwater flow.

5.3 Chromium Occurrence and Transformation in Soil

The ability for chromium to migrate (leach) from the soil medium to groundwater depends on the oxidation state (species) of the soil chromium, which itself depends upon soil Oxidation–Reduction Potential (ORP or redox) and pH. In most native soils, chromium is present predominantly in the III oxidation state, in which very low solubility and low reactivity result in low mobility to the aqueous environment. Under oxidizing conditions (such as the approximately 10-foot thick site vadose zone), trivalent chromium transforms to chromate (the hexavalent state), which is relatively soluble and thus more mobile than trivalent chromium. A 2003 leachability study found that chromium had the least mobility of all metals studied, particularly when present in the III oxidation state. Chromium mobility was studied for 4 years in a sandy loam soil, which found that after an initial period of mobility, the chromium formed insoluble complexes which sorbed to soil, and little leaching was observed thereafter (from ATSDR; see Appendix H). In soils with high concentrations of iron and manganese oxides, chromium can readily be removed from the soil by sorption processes (Malcom Pirnie, 2004), which may be relevant to Delaware soils in general, and the site soils in particular.

5.4 Chromium Occurrence and Transformation in Groundwater

The species of chromium present in groundwater depends upon the ORP and pH conditions in the aquifer. As with soil, hexavalent chromium (CrVI) predominates under oxidizing conditions such as shallow oxygenated aquifers while trivalent chromium (CrIII) is dominant under reducing conditions existing in deeper, anaerobic groundwater (ATSDR, see Appendix E). Many studies have investigated the transformation between these two prevalent oxidation states; the reduction of CrVI to CrIII and the oxidation of CrIII to CrVI. In water, the CrVI species is transformed (reduced) to the CrIII species in the presence of reducing agents such as organic matter, iron oxides, hydrogen sulfide, sulfur, iron sulfide, ammonium, and nitrate. In particular, the reduction by sulfur (-2) or iron (+2) occurs rapidly, instantaneously to a few days. The reduction of CrVI to CrIII is also favored under acidic pH conditions (ATSDR). The transformation of soluble metal species (such as chromate CrVI) to a less soluble species (such as chromic CrIII), resulting in precipitation of the metal from the groundwater and associated decrease in its

aqueous concentration are the processes utilized in conventional technologies for remediation of elevated metals concentrations in groundwater.

The transport of aqueous chromium and subsequent sorption to soil particles generally increases with decreasing pH, so sorption of chromium to downgradient soils can be very significant in areas of neutral to acidic groundwater. The reduction of CrVI to CrIII with subsequent precipitation and sorption to soil are the processes which largely control the mobility of CrVI. In iron-rich environments (such as Delaware's unconfined aquifer), the reduction of CrVI to CrIII will not permit CrVI to migrate significantly (M. Pirnie, 2004).

Site Groundwater Geochemistry

Geochemical characteristics of onsite groundwater were measured and recorded in the RI on Groundwater Sampling Field Sheets; these parameters change as stagnant groundwater is purged from standing wells, while the attainment of stability in field measurements indicates the inflow of consistent aquifer water. Site-specific measurements of groundwater pH, Dissolved Oxygen, and ORP were reviewed to assess whether site groundwater conditions were favorable to the previously described transformation of soluble CrVI to insoluble CrIII, with subsequent precipitation and sorption to aquifer soils by which natural attenuation may be occurring at the site.

Site pH Measurements

Acidic groundwater (pH <7) was measured during the low-flow purging prior to groundwater sample collection at most of the shallow RI monitoring wells installed on and downgradient of the Procino Plating Site as follows:

Shallow well pH	May 2012	5.41 to 6.02 (Appendix C)
	May 2013	5.70 to 6.68 (Appendix D)
	May 2014	6.02 to 6.88 (Appendix E)
	May 2015	5.73 to 6.71 (Appendix F)

Deeper well pH

- The pH in the preexisting onsite well was circum-neutral to slightly basic, ranging from 7.26 to 7.54 units. The total depth and screened interval of this well are not known due to an obstruction encountered at a depth of 35 feet; however water from this well appears to be hydrologically distinct from that in the shallow wells.
- The pH measured at deep well DMW-1 (screened 34-44 feet) was clearly basic, ranging between 10.9 and 11.36; also distinct from the shallow well groundwater.
- The pH measured in DMW-2 (screened 33- 43 feet) ranged between 6.47 and 6.56; the similarity to pH measured in groundwater from shallow wells suggests a hydrologic connection between the two zones at this well.

Oxidation/Reduction Potential (ORP): The Oxidation/Reduction Potential (ORP) of site groundwater also varied with well depth and water pH. Most shallow wells had ORP values between 190 and 260. The ORP measurements at the on-site former production well and DMW-1 were markedly different from the others, with levels of -194 and -62 in

2013 and a 2014 DMW-1 value of 16. However, the measured ORP of 300 in DMW-2 was similar to that from shallow wells, as was ORP of 128 at DMW-3 in 2015.

Dissolved Oxygen (DO): Dissolved Oxygen (DO) measurements were also recorded during well purging. DO levels in the shallow water table wells in contact with the atmosphere generally ranged between 4.5 and 5.6 mg/L, reflecting aerobic conditions. Lower DO in the two deeper wells (2 to 3 mg/L) again suggests a geochemical difference from the shallow wells, with lower DO likely reflecting less atmospheric contact.

The above geochemical indicator parameters, including a slightly acidic pH, high dissolved oxygen, and high Redox level, measured during the RI in the groundwater at shallow RI wells demonstrates the presence of conditions supportive of the reduction of CrVI to CrIII. The variability in field parameters seen between shallow wells and two of the three deeper wells supports the interpretation of a degree of hydrologic separation between the shallow well groundwater and the deeper groundwater, indicative of "semi-confined" aquifer conditions in some portions of the Site.

5.5 Aquifer Constraints on Chromium Transport in Groundwater

In addition to geochemical conditions, the migration of chromium in groundwater in the Site vicinity is influenced by the geologic and hydrogeologic framework and site-specific aquifer characteristics as described in Sections 2.1 and 2.3. Aquifer characteristics are revisited below that are relevant to the migration of chromium-bearing Site groundwater.

5.5.1 Aquifer Composition

Regional Geologic Formations

The geologic formations present within the shallow subsurface at the Site and the vicinity consist of heterogeneous fluvial and estuarine deposits consisting of granular sediments interlayered at various depths (generally below 20 feet) with fine-grained silt and clay beds of varying thicknesses. The geologic formations comprising the subsurface from ground surface to a depth of approximately 100 feet are described by the DGS as follows:

- Dune Deposits consist of up to 10 feet of well-sorted fine-medium sand with thin brown silty soil lamellae.
- The Turtle Branch Formation consists of up to 10 feet of clean, well-sorted fine yellow to brown sand, which coarsens with depth, with rare-to-common laminae of gray-to-grayish brown clayey silt within the sand beds.

Below a depth of approximately 20 feet, the subsurface materials are represented by the more variable deposits of the Beaverdam Formation, possibly underlain by the upper granular facies of the Manokin (Cat Hill) Formation.

- Beaverdam Fm ranges from 50-100 feet thick (from depths of 20 +/- feet to 70-120 feet below ground surface in the Site vicinity); upper facies includes silty

fine-medium sand, clayey sandy silt, with a silt or clay matrix; lower facies is medium –coarse sand with beds of dark gray silty clay and clayey silt.

- Cat Hill Fm (formerly Manokin) Fm; ranges from 30 to 50 feet thick, depth estimates of 70-120 feet extending to depths of 100-150 feet; a fine-coarse sand with clayey to silty sand beds, with a lower facies of silty clayey sand.

Site-Specific Geologic Units

The shallowest 20 feet of subsurface materials encountered in the site RI soil borings consisted predominantly of clean well-sorted fine-to-medium sand; this texture comports with the above DGS descriptions for the two shallowest formations. Below depths of 20 feet, fine-grained silt and/or clay layers were encountered within the predominantly sand matrix in the soil borings drilled for the installation of all RI wells. Clay was previously encountered at the site at a depth of 20 feet in DNREC's MW-4 and MW-6 soil borings (SI, 2011) and at the Peninsula Plating Site in soil borings MW-1 and MW-3 (DNREC SI, 2007).

The subsurface stratigraphy as encountered in RI soil borings and compiled from existing DNREC well data is presented in two schematic cross-sections across the Site vicinity, along with the subsurface materials and depths reported on DGS drilling logs of local deep wells. Due to the lack of surveyed elevation data, the cross-sections are schematic and do not account for ground surface elevation differences. The locations of the two lines of section are shown on Figure 30. Cross Section A-A' is found on Figure 31, and Cross Section Line B – B' is found on Figure 32.

The North-South Cross-Section A-A' (Figure 31) illustrates several features. The two Town of Blades public wells are screened above a thick basal clayey unit; likely the lower facies of the Cat Hill Formation (Cat Hill B). Most of the borings penetrated fine-grained beds of varying thicknesses between depths of 15 and 60 feet. Local drinking water wells were screened generally below depths of 60 feet, which corresponds to depths below the zone of fine-grained material. Descriptive drillers logs were not available for local drinking water wells other than the recent Williams well; however depths of the well screens and other well construction information was provided by DNREC Division of Water. These domestic water wells are superimposed in the center of Line A-A' for purposes of illustration.

The NE-SW Cross-Section B-B' (Figure 32) provides a more detailed depiction of the shallower subsurface as encountered the RI monitor well borings. The primary feature illustrated in Figure 32 is the occurrence of fine-grained beds in the RI monitoring well borings. In contrast to the home well screen depths shown on Line A-A', the monitoring well screen depths shown on Line B-B' do not indicate a significant local water-bearing zone.

5.5.2 Aquifer Characteristics

The occurrence of fine-grained subsurface beds is relevant to the vertical movement of groundwater through the solid media, thus to migration of contaminants in groundwater. Fine-grained sediments (silt and clay) consist of smaller particle sizes (below the #200 sieve), and contain fewer granular mineral constituents (e.g. quartz and feldspars) and more platy minerals (e.g. biotite, muscovite, and finer clay minerals) providing greater

surface area for sorption than granular sand and gravel. As a result of these textural features, fine-grained sediments have lesser porosity and permeability than granular units, resulting in lowered hydraulic conductivity (interconnected pore spaces) through which water can travel. As a result, transmissivity is much lower through fine-grained deposits. These characteristics distinguish aquifers (granular porous materials able to contain and release large quantities of groundwater) from aquitards (a confining bed that retards but does not prevent the flow of water to or from an adjacent aquifer; a leaky confining bed).

The complex hydrologic nature of the unconfined Columbia aquifer in the Site vicinity was described as

> "...consists of the Beaverdam Formation with a hydraulic connection to the Manokin aquifer at depth...the two formations form an unconfined, or water-table, aquifer thickness of close to 150 feet..." (Town of Blades Source Water Assessment, DNREC Division of Water, 2000).

and

> "...The shallowest water-bearing unit is the Columbia aquifer, which includes the Beaverdam Formation and where present, the Manokin (renamed Cat Hill Fm) and Columbia Formations, and Nanticoke deposits. ...The Columbia functions as both an unconfined and a semi-confined aquifer. Saturated thickness ranges from below 30 to 100 feet. The variation in aquifer type and thickness is due to the complex interlayering of aquifer and confining beds" (DGS, 2004).

Vertical Groundwater Migration

The forgoing description states that the boundaries of the Columbia aquifer do not correspond with lithostratigraphic formation boundaries. DGS mapping of the unconfined aquifer in Sussex County shows some locations where the Columbia aquifer is as thin as 30 feet thick due to the presence of local confining layers. In other places, the aquifer extends to 100 feet thick or more, presumably in locations where fine-grained interbeds are thinner, less clayey in texture, discontinuous, or where granular portions of several formations are in subcrop (overlap).

The occurrence of localized fine-grained beds constrains the thickness of the Columbia aquifer and limits the vertical migration of groundwater. At the Site, fine-grained beds were encountered in all borings at depths between 20 and 30 feet. Further, the fine-grained layers were present in both of the deepest wells at continuous thicknesses of 3.6 feet and 8.5 feet. The top of the first clayey bed, an approximate depth of 23 feet, represents the base of the interconnected unconfined aquifer at the Site where chromium was generally detected.

Much lower chromium levels (1 to 4 μg/L, parts per billion) in the underlying "deeper" zone wells indicates a limited hydrologic interconnection to the shallow zone, that the clay layers are "leaky" to a small degree. These semi-confined conditions within the

deeper zone are also indicated by distinctly lower groundwater elevations and difference in geochemical parameters of pH, Dissolved Oxygen, and Redox as previously discussed.

Lateral Groundwater Migration

The horizontal (lateral) extent of chromium migration in the shallow groundwater is controlled by:

- The volume of chromium present in the secondary soil source area;
- The rate of removal / leaching of chromium to the groundwater from the soil;
- The transformation processes acting on the chromium within the groundwater medium, including: dissolution; sorption to the aquifer soil/sediment matrix as it migrates downgradient, dilution by upgradient and side-gradient clean groundwater; and transformation to less soluble species and/or compounds;
- The rate and direction of shallow groundwater flow.

Chromium Source: The former Chrome Tanks were removed in approximately 1999 and no longer act as a source of chromium to the soil. Impacted soil then acted as a secondary source of chromium to the groundwater. Out of 27 secondary source soil samples collected in 2015 below the tank locations, 19 samples (70%) had chromium at acceptable concentrations below DNREC's 214 mg/kg screening level. Sub-slab soil from the 8 grid locations where chromium exceeded 214 mg/kg was excavated and disposed offsite in the July 2015 Interim Action Soil Removal described in Section 4. As a result of the removal of the primary Chrome Tank source and the excavation of the most contaminated subsurface soils (the secondary source), chromium sources have been removed from the site to the degree logistically practicable. The cessation of the input of additional chromium will permit further attenuation of the groundwater plume.

Soil Leaching Rate: The sub-slab soil with the greatest 2012 chromium concentration (199 mg/kg) generated liquid leachate containing 245 µg/L of chromium using the Synthetic Precipitation Leaching Procedure protocols. A comparison of the 2012 MW-6 groundwater chromium concentration (approximately 1,000 µg/L) to the SPLP result of 245 µg/L suggests that chromium formerly in the soil had been removed (leached) from the soil and had already migrated to shallow groundwater. Although future soil chromium concentrations were considered likely to diminish over time due to gravity and the greater density of chromium compared to the soil matrix, the SPLP results also suggested that future groundwater chromium concentration in the soil source vicinity at MW-6 could remain above the MCL of 100 µg/L for some period of time.

These findings supported the performance of the 2015 Soil Removal Action in which chromium source soil was removed to the degree logistically practicable. Future leaching of chromium from residual subsurface soil below the Excavation Area and below the replaced concrete slab is considered to be minor.

Transformation / Plume Attenuation Processes: Chromium transformation processes and their cumulative effect of reducing plume size and volume were described in Section 5.4.

Groundwater Flow Direction: In six RI measurement events between April 2012 and May 2015, the direction of groundwater flow has consistently been determined to be to the south or slightly west of due south. Monitoring wells were installed in the RI in these directions to quantify downgradient chromium groundwater concentrations. The 2015 chromium concentration in downgradient well MW-15 was an estimated concentration of 12.9 (J) parts per billion, essentially at the lab limit of detection. The 2015 plume extended laterally an approximate distance of 250 feet to the south of the Procino Plant, as shown on Figure 24.

5.6 Fate and Transport Summary

The Chrome Tanks, the presumed primary source of the chromium released to the soils, are no longer present, thus no additional releases of chromium from those tanks will occur. The secondary source, the soil impacted by the release from the former tanks, has been excavated to the extent possible and removed from the Site in a 2015 Source Removal Interim Action. Residual chromium remaining in soil within the former chrome tank area lies below the building roof, clean backfill, and the concrete floor slab, thus is not subject to infiltration by incident rainfall. With no additional input of chromium and the lack of incident precipitation to facilitate leaching, the chromium in the pore spaces in the unsaturated vadose zone above the water table is anticipated to slowly migrate downwards although some chromium will remain sorbed to soil particles.

In the saturated zone below the water table, the removal (leaching) of chromium from the soils will continue to decrease the concentration of incident chromium via several geochemical processes collectively termed natural attenuation, including dissolution of primarily hexavalent chromium into groundwater, reductive transformation of the hexavalent species to trivalent species due to oxidation in the aquifer, and subsequent sorption of the trivalent chromium onto downgradient soils. Site conditions of slightly acidic pH and high oxygen groundwater in a geologic substrate of iron- and organic-rich estuarine deposits will support the adsorption of chromium from the groundwater to downgradient aquifer sediments, minimizing its migration and sequestering the chromium as insoluble chromium III.

Attainment of a stable equilibrium condition between influx and attenuation is typically indicated by a flattening in the reported plume concentration. Thereafter, in the absence of a continuing source of chromium to soil or from the soil to the groundwater, the volume and concentration (the magnitude and extent) of chromium present in the groundwater must decrease over time. Site chromium groundwater concentrations notably decreased in the year elapsed between the SI (2011) and the Phase I results (May 2012), and continued to attenuate as shown in the 2013 RI results. The marked attenuation indicated that the plume had passed the equilibrium stage, and the rate of chromium supply was not sustaining the plume at the same rate at which chromium was diminishing by natural attenuation processes. This trend continued over 2014 and 2015, at which time the chromium was significantly lowered, and in all but one well, attained concentrations below the drinking water MCL.

6.0 HUMAN HEALTH RISK ASSESSMENT

6.1 Risk Assessment Approach

A Human Health Risk Assessment for the RI at the Procino Plating site was conducted using a "risk-based" approach. The risk-based approach to site risk evaluation is based upon methodology developed by the US EPA as described in ***"Risk Assessment Guidance for Superfund (RAGS), Part 1, Human Health Methods" (EPA, 1989)***. The most recent 2014-5 sampling results were assessed and compared to the 2011 Site Inspection results and the 2012-2013 RI data to evaluate the potential for current conditions at and surrounding the Procino Plating Site to result in current or future human health risks. The Human Health Risk Evaluation was also performed in accordance with the State of Delaware DNREC's HSCA law, the HSCA Regulations, HSCA Guidance Manual, and the 2015 SIRS Human Health Risk Assessment Policy. Because no ecologically sensitive areas (ECSA) as described in DNREC's Remediation Standards Guidance were present at or near the site, ecological risk evaluation was not performed in the RI.

The "Conceptual Site Model" approach for Risk Assessment requires three criteria which must be present in order for risks to be potentially incurred:

1. A source of one or more contaminants at a concentration (a dose) above a regulatory standard sufficient to incur adverse health effects;
2. A pathway(s) of exposure by which the contaminant(s) can reach receptors and expose them to the possible health risk(s); and
3. A receptor(s) which is exposed to the contaminant(s) at the concentration sufficient to incur adverse health effects.

All three of the above criteria, if present, comprise a "complete exposure pathway" by which potential health risks may occur. If one or more of the above is not present, the pathway is incomplete, and risks cannot be potentially incurred.

6.2 Contaminant (COC) Identification and Occurrence

In DNREC's 2011 Site Inspection, one contaminant of concern (COC), the metal chromium, was identified at a concentration above a regulatory screening level. Chromium exceeded the EPA drinking water MCL in one of six onsite monitoring well groundwater samples (from MW-6). A nearby home well sample contained chromium and cyanide at concentrations well below MCLs.

Subsequent 2012-2013 RI groundwater samples showed a decrease in chromium concentrations, with exceedances of the MCL in MW-6 and one new RI monitoring well (MW-10) located approximately 60 feet from the plant on an adjacent property. Soil sampling efforts below the floor in the Procino Plant did not indicate chromium at a concentration above DNREC's 214 mg/kg Background Screening Level. No new COC contaminants were identified in the RI data.

The 2015 groundwater assessment confirmed the continuation of decreasing chromium concentrations in all sampled monitor wells. The MW-6 sample, although diminished from the 2014 level, contained chromium at 115 µg/L, still slightly above the 100 µg/L drinking water

MCL. Eight (8) of 27 soil samples collected in the 2015 soil delineation below the floor of the plating plant contained chromium at a concentration above 214 mg/kg; the accessible volume of those contaminated subsurface soils was removed in the July 2015 Interim Action.

In sum, contaminants of concern quantified in 2011- 2015 RI sampling efforts at the Procino Plating Site remain limited to the metal chromium. Locations where chromium concentration exceeded regulatory levels based upon May 2015 samples were limited to two (2) post-excavation subsurface soil samples below the concrete floor at a 10-foot by 10-foot Excavation Area inside the Procino Plating plant, and groundwater in the immediate vicinity of one non-potable monitoring well (MW-6) also on the Procino Plating Site where the 2015 chromium concentration (115 µg/L) slightly exceeded the 100 µg/L MCL.

6.3 Exposure Assessment

This section contains an evaluation of the potential routes of exposure by which current or reasonably anticipated future site users could be exposed to chromium detected at COC concentrations, i.e., above the soil screening level in the limited elevated subsurface soil chromium sample areas, and in groundwater above the MCL from MW-6 at the Procino Site.

6.3.1. Soil Exposure Pathways

The pre-excavation soil samples containing a chromium concentration above the Screening Level were collected from a 10-foot by 10-foot Excavation Area at depths up to 8 feet below the floor of the building. This limited area of elevated soil chromium is not within the zone of general commercial / industrial site worker contact, as such, this pathway is considered to be incomplete. Furthermore, that area was remediated in a July 2015 by the excavation of the accessible volume of contaminated subsurface soil, followed by the placement of clean concrete debris and crushed rock backfill, then covered with a concrete slab. Exposure of a future Excavation worker to residual chromium-containing subsurface soil remaining below the Excavation Area after the removal action, now also beneath clean backfill and a concrete slab, is considered to be a possible but not a likely future exposure pathway.

6.3.2 Groundwater Exposure Pathways

The site location where groundwater currently contains chromium at a concentration above the drinking water standard is limited to one monitoring well (MW-6) on the Procino Site outside the south side of the Plating building. Groundwater from that immediate well vicinity is not used as a source of drinking water for the Procino Plating Site or any surrounding property. Nor is groundwater from any of the RI monitoring wells on or near the site used as a source of drinking water for the Procino Plating Site or any surrounding property. The chromium concentration from MW-10, the closest well to MW-6 located 50 feet downgradient (south) of MW-6, had decreased below the MCL in the 2015 sampling. Procino Plating and surrounding Town properties obtain drinking water from the Town of Blades, a regulated public water provider. Chromium concentration in the public well groundwater is evaluated annually per EPA requirements. The location of Procino Plating within the public well Wellhead Protection Area indicates that site groundwater may provide a small contribution of groundwater within the cone of influence captured by the public wells; however, groundwater flow towards the public wells

has never been measured by site-specific groundwater elevation measurements. The 2011 SI and six (6) subsequent site-specific RI depth-to-groundwater measurements have shown shallow groundwater flow in the chromium plume to be towards the south, away from (not towards) the public wells located 0.8 mile north of the Site. Further, the 2015 chromium concentrations within the offsite plume meet the drinking water standards thus could be ingested as drinking water without incurring adverse human health risk. Although not indicated to be occurring, if captured within the public well cone of influence, the low plume chromium concentrations would be further diluted by the large volume of water moving through the unconfined aquifer.

The nearest homes to the west of the Procino Site which obtain potable water from groundwater do not contain, nor on the basis of the 2011–2015 data have they ever contained, chromium at a concentration approaching or above the MCL. Nor are future home well chromium concentrations likely to exceed the MCL because the concentration upgradient of the homes (at the Site and surrounding areas) has diminished markedly in all measured wells and currently only one well (MW-6) contains chromium marginally above the MCL.

Based upon the foregoing, the exposure pathway of the hypothetical ingestion of site groundwater from the MW-6 area where chromium concentration exceeds the MCL is an incomplete exposure pathway due to lack of receptors. Hypothetical ingestion of groundwater in the home wells, from site wells other than MW-6, or from the plume as a whole, while unlikely, could possibly occur in the future. However, groundwater chromium concentrations off of the site are insufficient to pose human health ingestion risks; in the absence of a risk-causing dose, this exposure pathway is also incomplete.

6.4 Toxicity Assessment

6.4.1 Soil Risk Quantitation

Soil risk levels for total chromium are not included in the Risk Assessment Information System (RAIS) calculator tool. DNREC (July 2015) published a total chromium Screening Level of 214 mg/kg, which represents a statewide background average concentration rather than a health-based concentration reflective of toxicity. DNREC also published a trivalent chromium Screening Level of 12,000 mg/kg for a Hazard Quotient (HQ) of 0.1 and a hexavalent Screening Level of 0.3 mg/kg (for a cancer risk level of 1E-06). These same concentrations are also listed by EPA Region III June 2015 Regional Screening Levels (RSLs) for a residential land use scenario. EPA's commercial / industrial soil RSLs are 180,000 mg/kg trivalent chromium (HQ of 0.1) and 6.3 mg/kg hexavalent chromium for a cancer risk level of 1E-06. The corresponding soil concentrations that would result in acceptable commercial / industrial risk levels under HSCA (those yielding a HQ=1 and a cancer risk of 1E-05 for a single contaminant) would then be 10 times the RSL, or 1,800,000 mg/kg (trivalent chromium) and 63 mg/kg (hexavalent chromium).

From the preceding, it can be concluded that soil would not generally pose a potential for unacceptable commercial /industrial worker risks for chromium as a sole contaminant if it were to contain up to 1,800,000 mg/kg of trivalent chromium or up to 63 mg/kg of hexavalent chromium. The distribution of chromium species in the soil at the Procino Plating Site has not been analyzed; however, plating facilities typically utilize predominantly hexavalent chromium

in their operations. Consequently, it was conservatively concluded that Procino site soil total chromium levels above 63 mg/kg have a potential to pose commercial / industrial worker health risks because all the detected chromium may be present in the hexavalent form if a complete soil exposure pathway to the soil chromium is present.

A conservative estimation of soil toxicity for a concentration of DNREC's 214 mg/kg Screening Level was determined using RAIS assuming 214 mg/kg of total chromium was present in the hexavalent form. Assuming that a complete pathway of soil exposure were present, the potential soil risk to onsite workers under this very conservative scenario ranged from 2E-05 (for Indoor Workers) to 4E-05 (for Composite Workers); the RAIS printouts are found in Appendix I. Although site soils with a chromium concentration above 214 mg/kg were removed to the extent practicable in the 2015 Interim Action Soil Removal, two of the post-excavation soil samples exceeded the 214 mg/kg chromium Screening Level.

The small dataset of seven post-excavation samples does not permit calculation of a representative statistical "average" subsurface soil concentration, therefore the maximum post-excavation soil sample concentration of 392 mg/kg was used as the exposure concentration to assess potential risk to future Construction / Excavation workers. Assuming all chromium was present as hexavalent chromium, the RAIS calculated potential soil risk to future Construction / Excavation workers was 6E-07, which is acceptable; RAIS printouts are found in Appendix I.

6.4.2 Groundwater Risk Quantitation

The calculation of hypothetical risk levels posed by the ingestion of total chromium in groundwater (as tap water) is not able to be performed using conventional methods such as RAIS. Instead, the MCL established under EPA's Safe Drinking Water Act is used herein as the indicator of groundwater toxicity. The concentration of chromium in 2015 groundwater samples collected on and surrounding the Procino Site was below the EPA MCL of 100 μg/L, with the exception of one sample (MW-6) at a concentration of 115 μg/L. Human health impacts from the ingestion of groundwater from offsite plume areas or from onsite wells other than from MW-6 are not indicated based upon the 2015 groundwater chromium concentrations, nor would ingestion exposures occur from MW-6 under the incomplete pathway of onsite groundwater ingestion.

A statistical "average plume chromium concentration" of 43.3 μg/L was calculated using ProUCL software for the 20 RI groundwater samples collected in 2014 and 2015 as represented by the 95% Upper Confidence Limit of the mean of the reported groundwater concentrations; the data are shown on Table 5 and the ProUCL printout of the 95% UCL is found in Appendix H. Neither the "plume average" 95% UCL concentration (43.3 μg/L) nor the individual "worst case" maximum chromium concentration (115 μg/L from MW-6) indicate potential adverse impacts to human health in light of the observed trend of rapid attenuation and the absence of onsite MW-6 groundwater ingestion receptors.

6.5 Risk Evaluation Conclusions

Soil Risks: Onsite subsurface soil with chromium above DNREC's Screening Level of 214 mg/kg was delineated in the 2015 soil boring program and subsequently excavated and disposed

offsite in the Interim Removal Action. Only two samples from subsurface soil below the Excavation Area (below the plant floor slab at the former chrome tank location) contain chromium at a concentration above the 214 mg/kg Screening Level. Because the subfloor area is not and will not be accessible for routine site commercial / industrial worker exposure, no exposure pathways are complete for current or future on site commercial / industrial workers to contact residual subfloor soils with chromium above the Screening Level. The potentially complete pathway of subsurface soil exposure to future Excavation /Construction workers was found to result in acceptable risk levels using the conservative assumptions of exposure to the maximum reported chromium concentration all of which is in the hexavalent species.

The 2015 reported groundwater chromium concentrations were below the EPA MCL of 100 µg/L for all sampled wells other than one site monitoring well adjacent to the south side of the plating building (MW-6), in which chromium was reported at 115 µg/L, slightly above the MCL. The groundwater ingestion exposure pathway is not complete at the MW-6 well; neither the well nor the surrounding site grounds are used for potable groundwater. Further, based upon the trend in diminishing chromium concentrations, it is anticipated that the current concentration of 115 µg/L will attenuate to a level below the MCL in the near future.

Offsite groundwater does not currently contain chromium or other plating-related metals at a concentration above the drinking water standards. Nor is it anticipated, given the decrease in groundwater chromium concentration observed since 2011, that future chromium concentration conditions beyond the boundaries of the Procino Site can or will exceed the MCL in the future. The direction of contaminant flow in the chromium plume was consistently measured to be towards the south, away from (not towards) the public supply wells to the north, or towards the neighborhood of private wells to the west. The hypothetical ingestion of groundwater from the other 19 of the 20 wells sampled in 2014-2015, either individually or collectively, would not result in an exposure to chromium in excess of the MCL, therefore would not pose human health risks in the unlikely event of an ingestion exposure.

6.6 Data Quality Assessment

The Data Quality Objectives (DQOs) for the Remedial Investigation were to obtain accurate, reliable, replicable, and defensible sampling and measurement data sufficient to characterize the environmental nature of site media and to evaluate its potential for risks to human health and the environment for remedial decision-making. These DQOs were met or exceeded by the quality and quantity of the site measurement data collected in all phases of the RI.

Representativeness: The locations selected for the collection of RI soil and groundwater samples were purposively chosen using a non-random approach biased to target likely worst-case soil and groundwater areas such as onsite source soils, wells directly adjacent to and downgradient of presumed soil sources, and sentry wells between the site and potential drinking water receptors. Other sample locations were sited at presumed plume margins in order to determine the magnitude and maximum extent of site-related chromium contamination.

41 soil samples were collected and analyzed in the RI which collectively provided a thorough characterization of the chemical nature and the extent of the chromium release to soil below the former chrome tanks. No hazardous waste characteristics were reported in the soil samples

analyzed for disposal facility profiles including a full TCL and TAL analysis. Twelve (12) groundwater monitoring wells were installed and sampled at least once, most several times, in addition to the six wells installed and sampled by DNREC SIRS which were also resampled in the 2014 RI work. These efforts resulted in a large set of sampling data that were collected and evaluated for the RI of this 1.16-acre Site. The quantity of the RI data and its representativeness of actual site conditions are considered to be high.

The accuracy and precision of the laboratory analytical data were evaluated by the lab using specific Quality Assurance procedures and samples. Percent Recovery values were calculated for spiked samples and Relative Percent Difference values were calculated for matrix spike samples and matrix spike duplicate samples. The reported QA results were generally within accepted ranges. None of the sample results were "qualified" in the QA review as unreliable, out of hold time, or rejected.

The use of standard analytical methods provided comparability of the generated sampling data. Eurofins/Lancaster Laboratories Environmental (ELLE) performed the laboratory analyses of soil and groundwater samples using EPA SW-846 methods in accordance with DNREC-SIRS protocols, including the use of site-specific quality assurance / quality control (QA/QC) samples. Lab data packages and electronic data deliverables were prepared by the lab in accordance with the Delaware Data Deliverable Model (3DM). Because Eurofins/Lancaster Labs is a "pre-approved HSCA contracting laboratory", a comprehensive third-party validation for the sampling data was not required per DNREC-SIRS policy.

The completeness of the RI dataset was 100 percent. All media samples planned to be collected were able to be collected although some wells had to be relocated or replaced with wells at comparable locations. All of the collected samples were analyzed by the laboratory, with none rejected for failure to meet data quality standards.

The scope of the RI sampling over 2012 - 2015, coupled with DNREC's 2011 SI data, was appropriate and sufficient to identify the nature and extent of contaminants of concern (COCs), to evaluate potential COC sources and migration pathways; to assess the risks to human health and the environment associated with site COCs; and to determine whether or not remedial actions were warranted.

6.7 Uncertainty Evaluation

Because many sources of uncertainty and/or error exist in any set of measurements, the conclusions based on those data are also subject to a measure of uncertainty. The goal of an uncertainty analysis is to identify whether the magnitude of the uncertainties is small, and therefore does not contribute to uncertainty in the conclusion, or large, potentially rendering the conclusions erroneous.

Small levels of uncertainty are typically associated with the precision and accuracy of the laboratory results of the analyses of the site samples. Because the data quality objectives set for accuracy and precision of the lab data collected in the RI efforts were met, the level of associated uncertainty in the reported results is believed to be very small. Because depth to groundwater was measured multiple times (six events in the RI period and 1 in the SI) with consistent results

reported, there is little uncertainty in the reported southerly direction of groundwater flow. Similarly, the collection of four rounds of water quality data from the early RI wells MW-7, MW-8 and MW-9 resulted in a robust characterization of the central plume area over time and reduced the potential for analytical uncertainty.

7.0 REMEDY EVALUATION

Delaware's HSCA Act and promulgated HSCA Regulations require that unacceptable levels of risks to human health posed by site conditions under current or likely future site uses must be lowered to meet HSCA quantitative risk levels by the performance of a Remedial Action.

RI data did not identify complete exposure pathways by which unacceptable levels of human health risk would be posed by current Site soil or groundwater conditions. No human ingestion of Site groundwater containing chromium at concentrations above the MCL from MW-6 is currently occurring or likely to occur in the future. No current onsite commercial / industrial workers can experience direct contact with subsurface soil below the clean backfill under the concrete plant floor.

However, chromium concentration in two post-excavation subsurface soil samples at the base of the excavation located below the Excavation Area under the plant floor exceeded DNREC's Screening Level, thus a protective soil remedy is warranted. A remedy is also needed in order to prevent future ingestion exposures to MW-6 groundwater.

7.1 Remedial Action Objectives

Remedial Action Objectives (RAOs) are statements that both qualitatively and quantitatively identify the desired remedial outcomes. The following RAOs have been established for the Procino Plating Site:

QUALITATIVE RAOS

- To prevent potential future human ingestion of chromium currently present in Site groundwater at MW-6 at a concentration above the MCL; and
- To prevent potential future commercial / industrial worker direct contact exposures to chromium in soil currently present in subsurface soil at a concentration above the DNREC Screening Level.

QUANTITATIVE RAOS

- To prevent human ingestion of groundwater from one well containing total chromium at a concentration above the US EPA Maximum Contaminant Level of 100 micrograms per liter; and
- To prevent potential future human direct contact exposures to chromium in subsurface soil at a concentration above DNREC's 214 mg/kg Screening Level.

7.2 Identification and Evaluation of Applicable Remedial Technologies

The following section lists remedial technologies by which the RAOs can be attained.

7.2.1. Source Removal

A potential remedial means to reduce elevated soil (and therefore groundwater) COC concentrations is to remove the soil impacted by the release from the Chrome Tanks source that resulted in the groundwater contamination. This Source Removal remedy was already implemented as an Interim Remedial Action in July of 2015 at the Procino Plating Site. Based on the removal of the subsurface soil which presumably was contaminated by the release from the Chrome Tanks, residual soil chromium concentration remaining at the Site has been lowered. As a result of the secondary source removal, groundwater chromium concentration is also anticipated to continue to attenuate.

7.2.2. Groundwater Treatment

Several treatment alternatives are commercially available which can be utilized to lower elevated metals concentrations in groundwater. A system of PVC pipes was installed at the site below the Excavation Area following the soil removal to provide access for a future subsurface application of EHC-M or other treatment slurry if warranted. Because no current onsite receptors exist to groundwater ingestion, and because offsite concentrations are all below the MCL, groundwater treatment is deferred pending further monitoring to demonstrate whether chromium concentrations will continue to attenuate on their own. If they "stall" and remain elevated above the MCL, the ECH-M product will be purchased and applied in accordance with the procedures described in the DNREC-approved Interim Action Work Plan.

7.2.3. Institutional Controls

Institutional controls are legal vehicles which are placed to restrict the allowable future actions resulting in an unacceptable risk on relevant properties. Institutional controls on groundwater use can be implemented via an Environmental Covenant (EC) which would prohibit the use of groundwater for drinking water purposes until the groundwater contaminants (chromium) diminish to a concentration below the MCL at all wells.

7.3 Remedial Recommendation

No unacceptable levels of human health risk are posed by the site under current conditions. An Interim Source Removal Action in July 2015 removed accessible areas of the soil chromium secondary source area. The exposure pathway of ingestion of onsite groundwater at MW-6, the sole location where chromium concentration currently exceeds the MCL, is incomplete. As a result, the performance of additional active remedial actions is not warranted.

In order to control future inadvertent exposures to onsite groundwater chromium at a concentration above the MCL, we recommended the placement of an Environmental Covenant (EC) prohibiting groundwater potable use on the Procino Plating property where chromium concentration exceeds the MCL. The EC should also include a prohibition on subsurface excavation by untrained personnel which could inadvertently expose future onsite workers to elevated chromium concentrations in the residual soil below the Excavation Area not able to be removed during the Interim Removal Action.

It is further recommended that Procino Enterprises perform ongoing monitoring of groundwater chromium concentration conditions through the implementation of a DNREC-approved Long Term Stewardship (LTS) monitoring program at selected existing monitoring wells, with the data to be summarized and reported annually to DNREC. Upon DNREC's approval of the LTS Plan and the recordation of the EC, Procino Plating will be eligible for a Certification of Completion of Remedy from DNREC. Once the groundwater monitoring data demonstrate a reduction in groundwater chromium to concentrations below the MCL, the monitoring will be terminated (upon DNREC's concurrence) and the EC restrictions will be removed from the property deed.

8.0 INTERIM ACTIONS

Following their 1985 acquisition of the property, Procino Plating removed the Chrome Tanks and replaced the wood floor in the former Chrome Tank area with a poured 6-inch concrete slab in approximately the late 1980's. As a part of the 2007 decommissioning of permitted onsite water treatment system, the plant floor drains and subsurface piping were grouted with cement to eliminate them serving as migration pathways by which plating metals could enter the subsurface.

In July of 2015, A DNREC-approved Interim Soil Removal Action was performed as described in Section 4 of this report.

9.0 SUMMARY, CONCLUSIONS, and RECOMMENDATIONS

9.1 RI Scope

A Remedial Investigation (RI) was conducted from 2012-2015 by Ten Bears Environmental of the Procino Plating Site located at 901 South Market Street in Blades, Sussex County, Delaware, to further assess environmental site conditions, primarily to determine the magnitude and extent of chromium in groundwater that was identified in an onsite monitoring well installed by DNREC SIRS in their 2011 Site Inspection.

The RI field work was performed in four separate phases:

1. Phase I (May 2012) included a soil-sampling chromium source assessment at the former Chrome Tank locations and a shallow groundwater evaluation in which 3 Geoprobe™ wells were installed and sampled with 2 SI wells for TAL metals plus cyanide.
2. Phase II (May 2013) consisted of installation and sampling of 3 shallow Geoprobe™ wells for total chromium, and of 2 deeper double-cased Hollow Stem Auger / mud rotary wells for total chromium and cyanide. One domestic well sampled in the SI was re-sampled for total chromium and cyanide. A 2013 Draft RI Report included subsurface stratigraphic data from site borings and surrounding wells, compiled along with soil and groundwater sample analytical results and multiple measurements of shallow groundwater elevations and flow direction.
3. Phase III RI efforts were conducted in May of 2014 which consisted of a site-wide chromium groundwater assessment at 20 wells.

4. Phase IV work included the installation (April 2015) of 3 additional shallow and 1 deeper Geoprobe™ wells and the May 2015 collection of groundwater samples from nine wells which were analyzed for dissolved chromium.

9.2 Nature and Extent of Chromium Contamination

Total chromium was the single site-related COC identified in the Procino Plating Site RI sample data at a concentration above a regulatory soil screening level or groundwater standard.

9.2.1 Soil

Although 2012 soil chromium levels from samples collected under the plating plant floor slab were all below DNREC's Screening Level of 214 mg/kg, a 2015 systematic grid soil boring /sampling effort delineated localized and discontinuous pockets of higher chromium within a 10-ft by 10-ft area from depths ranging between 3 feet to 8 feet. These areas were excavated in July of 2015 to the extent practicable although the excavation depth was hampered by interior wall footings and a limited area of operation. To obtain approval for a disposal facility to accept the excavated site soils, samples of "worst case" soil were composited from delineation samples having highest reported total chromium concentrations. These samples were analyzed for a robust hazardous waste profile of laboratory parameters (e.g. full TCL and TAL, RCRA characteristics, Toxicity Characteristics Leaching Procedure, etc.) with no results indicative of hazardous conditions or materials. Post-removal residual soil chromium concentrations above 214 were reported from the analysis of two of seven post-excavation soil samples, both located at depth below the backfilled and concrete capped Excavation Area.

9.2.2 Groundwater

The horizontal extent of the area over which chromium exceeded the MCL in the Phase I RI (2012) using data from six SI wells and three Phase I RI wells was the immediate vicinity of MW-6 and extended downgradient less than 100 feet to the south based on interpolation between MW-6 and the nearest downgradient well MW-8 where chromium was not detected. DNREC requested additional chromium delineation horizontally to the south and vertically.

Using three new (Phase II) shallow wells to supplement data collected from existing wells, the 2013 horizontal extent of the chromium plume with a concentration above the MCL generally coincided with the 2012 interpolated extent of 100-foot downgradient. A southerly flow, rather than southwesterly, was indicated based on new well MW-10, located approximately 55 feet south-southeast of MW-6. The downgradient (southern) margin of the apparent 100 µg/L plume area was interpolated as the mid-point between MW-10 (193 µg/L) and MW-11 (6 J µg/L). The vertical extent of the chromium plume above the MCL was limited to the shallow 20-24 feet depths of MW-6 and MW-10. Chromium in two deeper (44-feet deep) downgradient well samples was 1 (J) to 4 (J) µg/L, very low estimated (J-qualified) concentrations well below the MCL. DNREC again requested additional chromium delineation horizontally and vertically to the southeast from MW-10 to confirm interpolated plume boundaries.

Groundwater with a chromium concentration above the MCL was reported in 2015 from the MW-6 well sample only, which at 115 µg/L, was slightly above the 100 µg/L MCL. Chromium

ranged from non-detect to 0.0129 J µg/L in samples from three new shallow and one deeper well installed south and southeast of MW-10. All chromium concentrations for samples collected from offsite wells were below the MCL where detectable; most (12 of 19) groundwater samples collected in 2014 or 2105 had reported chromium concentrations below the limit of detection.

The extent and magnitude (concentration) of chromium in groundwater has been delineated by sampling of a 20-well network. May 2015 maximum chromium was 115 µg/L at onsite monitor well MW-6. Other than MW-6, chromium levels are below the MCL. Chromium concentrations in samples from all wells sampled more than once have diminished significantly (90% at MW-6) over the RI period (May 2012 to May 2015).

RI Groundwater Evaluation Summary

From the RI start in May of 2012, groundwater sample collection and laboratory analysis has documented a 4-year trend of significant reduction of groundwater chromium concentrations. Further, the 2015 groundwater evaluation revealed the significant finding that all offsite groundwater samples showed attainment of drinking water standards. An assessment of the potential for site soil and groundwater concentrations to result in human health risks is found in Section 6 of this report. However, the following findings can be made upon the basis of the data presented in preceding Section 3, including:

- The 2012 SPLP soil leaching test reported that leachate with 245 ug/L chromium was extracted from soil collected below the former Chrome Tanks (the presumed secondary source);
- Higher groundwater chromium concentration (959 ug/L) from onsite MW-6 indicated that most of the mass of chromium released to the soil had already migrated to the groundwater;
- Decreasing groundwater chromium concentrations measured since 2011 support the finding that release of chromium presumably from the former chrome tanks was halted, and the migration of chromium from the soil underlying the tanks to groundwater had slowed;
- The subsurface soil secondary source was mitigated to the extent practicable by the performance of a 2015 Interim Soil Removal Action;
- The "post-removal" residual chromium remaining below the Plant floor as indicated by the post-excavation samples does not represent a significant source of future chromium to groundwater per the 2012 SPLP results;
- Chromium concentrations within the monitored groundwater plume have continuously and consistently attenuated since 2011;
- Consistent decreases in plume chromium concentrations coupled with shrinking plume margins show that the rate of supply of new chromium to groundwater is less than the natural attenuation processes acting to remove it;
- Boundaries of the groundwater chromium plume have been delineated to "non-detect" concentrations in all directions surrounding the Procino Plating plant, both horizontally and vertically;

- The area over which chromium currently is present at detectable levels in groundwater is limited to an area south of the former Chromium Tank location extending south approximately 300 feet and having an east-west width of approximately 100 feet;
- The areal extent of the plume containing chromium above the MCL is approximated as less than 50 feet long (to the south of MW-6) and 35 feet wide (east-west)
- Groundwater samples collected from three deeper wells (DMW-1, -2 and -3) screened below the first encountered clay layer (at 20–30 feet) do not contain chromium at detectable concentrations although low levels were reported from the shallow wells (MW-8, MW-15) at these locations; this indicates that fine-grained aquifer materials are preventing vertical chromium migration at those locations (and likely at other surrounding locations where they may be present);
- Multiple and consistent site-specific measurements of groundwater elevations and of contaminant distribution in relation to the onsite source area, have determined a south (to slightly southwest) direction of shallow groundwater flow at the Procino Site and the plume areas downgradient.
- Consistent southern groundwater flow direction indicates that site groundwater is not captured by the cone of influence of the pumping from the Town of Blades wells 0.8 miles north of the Site. If such were occurring, site-specific water-table measurements and elevations would indicate a northerly elevation gradient and flow direction rather than the southerly direction measured in every RI event to date as well as in DNREC's 2011 SI.
- DNREC Water Supply and Delaware Geological Survey (DGS) well records substantiate that potable water wells in the Site vicinity obtain water from deeper, more granular sections of the 100-150-foot thick unconfined aquifer; typical screen settings included 66-96 feet (two Town wells); four wells screened 100–110 feet; two wells screened 70-80 feet; one 60-70; one 75-85. In combination with Well Logs describing clay encountered at various depths below 20 feet, the preponderance of the available historical information indicates that local water supply wells were intentionally installed to obtain water from greater aquifer depths to minimize the potential impacts from onsite septic systems, possible surface spills and other shallow releases of contamination.
- The subsurface materials encountered in the RI drilling of monitoring wells were consistent with published DGS descriptions of fine to coarse sand and estuarine clayey silts to silty clays deposited during interglacial periods of high sea level. Fine-grained (silt or clay) layers were encountered within predominantly granular materials in the drilling of all RI wells below 20 feet. Clay layers were described in the Well Logs of most of the home wells drilled near the Site. Although these beds may or may not extend laterally to form a continuous "confining layer", the occurrence of fine grained layers of a few inches up to 8 feet thick provides localized zones of lower permeability which inhibit the vertical migration of shallow groundwater within the 100-to-150 feet thick Columbia aquifer and provide some degree of protection to deeper water supply wells from shallow contaminants.
- Because offsite chromium concentrations have diminished to a level below the EPA MCL for drinking water, offsite groundwater ingestion does not represent a potential pathway for risk to human health.
- Residual chromium concentration in onsite MW-6 groundwater directly adjacent to the former chrome tank (the presumed source of the release) has also attenuated and

diminished to a level which, although marginally above the MCL, is not used for drinking water therefore does not represent a potential human health risk, and based upon observed data trends, should continue to diminish over time.

9.3 Assessment of Human Health Risk- Summary

Chromium was the only soil contaminant detected at concentrations above Screening Levels in the RI soil sample data. Samples with elevated chromium were located erratically in subfloor subsurface soil from a delineated Excavation Area, which was subsequently excavated and backfilled with clean materials in July of 2015. A future excavation worker exposure at the specific post-excavation subsurface soil sample locations below the backfilled Excavation Area is the only potentially complete soil exposure pathway by which future Site users could incur soil-related exposures or risks. Although an unlikely pathway, risk was quantified along this pathway and calculated to be acceptable.

Groundwater chromium concentration exceeds DNREC and EPA's MCL in one monitoring (not potable water) well south of the plating building (MW-6). The current concentration of 115 µg/L is marginally above the MCL of 100 µg/L, which may (or may not be) sufficient to pose chromic human health impacts if ingested over time. The property on which MW-6 lies is located within the Town of Blades and is provided with public drinking water, thus the groundwater ingestion exposure pathway to MW-6 groundwater on the Site is incomplete. Offsite groundwater from all wells other than MW-6, although not currently occurring or likely to occur in the future, does not contain MCL-exceeding chromium levels, therefore ingestion of offsite groundwater is not indicated to pose human health risks.

9.4 Remedial Recommendations

Under current conditions, no complete exposure pathways to human site users are present at the very limited areas where residual chromium exceeds a screening level (the subfloor soil) or an MCL (the groundwater in the MW-6 well). Therefore, no unacceptable level of risk is posed to human health at or by the Procino Plating Site under current conditions. Further, an active Soil Removal Action has already been implemented which not only eliminated worker soil contact exposures, but also removed the secondary source impacting the groundwater. Chromium groundwater concentrations have declined markedly and are generally below regulatory standards. As a result, an active remedy is not warranted.

However, chromium concentration in two post-excavation soil samples exceeded the 214 mg/kg Screening Level, which was calculated to potentially pose unacceptable human health risks if all chromium were present in the hexavalent form. MW-6 site groundwater slightly exceeds the MCL, therefore is considered to pose a modest ingestion risk. Therefore we recommend in an abundance of caution, a remedy to control future, possibly unacceptable exposures by placing an Environmental Covenant on the deed of the Procino Plating property which prohibits the future use of site groundwater for drinking water and prohibits future ground-intrusive activities at the Interim Action soil Excavation Area unless prior DNREC approval is granted.

Further, to document the continuation of the decreasing groundwater chromium concentrations, we recommend that Procino Plating undertake periodic monitoring of groundwater conditions at selected monitoring wells under a DNREC-approved Long Term Stewardship (LTS) program in which the data is summarized and reported annually to DNREC.

Monitoring Program Recommendations

Ten Bears recommends that a groundwater monitoring program be instituted at selected site monitoring wells to document chromium groundwater levels over time. Although not considered likely based on trends in the existing SI and RI data, a chromium increase would indicate a continued or renewed source of chromium being supplied to the groundwater. A pattern of stable chromium concentration suggests an equilibrium condition between supply of chromium and the action of attenuation processes. The anticipated future condition of a continuing decrease in chromium concentration will demonstrate that the attenuation processes are acting faster than chromium is supplied, and the plume is diminishing in extent and magnitude.

The well locations recommended for sampling and selection rationale for the monitoring program are:

- MW-6, to assess chromium levels in groundwater immediately downgradient of the former Chrome Tanks to demonstrate changes in groundwater quality closest to the former source, and to document the timeframe for the attainment of onsite concentrations below the MCL which will trigger cessation of the groundwater portions of the EC;
- MW-8 and DMW-1 as sentry wells to monitor chromium concentration in both the horizontal and vertical directions to the southwest, closest to the adjacent neighborhood;
- MW-10, to monitor offsite chromium concentration immediately downgradient to the south-southeast of the Site.

An initial semi-annual frequency of groundwater monitoring is recommended for the analytical parameter of dissolved chromium. After the first four events (2 years) the trends in the data, if any, may suggest modifications to the semi-annual frequency of sample collection or may indicate a need for changes in the locations sampled. Under equilibrium conditions, the plume will neither increase nor decrease in the short term, in which case the attainment of the target groundwater MCL for chromium (100 μg/L) at MW-6 may require a period of time. However, ongoing monitoring will quantify changes to the plume magnitude and extent through time.

Upon the recordation of the Environmental Covenant and DNREC's approval of the LTS Plan, Procino Plating will be eligible for a Certification of Completion of Remedy from DNREC. Once the groundwater data demonstrate a reduction in groundwater chromium to levels below the MCL, the groundwater monitoring program will be terminated (upon DNREC's concurrence) and the EC groundwater restrictions removed.

9.6 Schedule for Project Completion

Milestone / Deliverable Date

The following dates are estimated, but represent reasonable projections of timelines for the completion of the RI project.

Late November 2015	Receive DNREC-SIRS comments on Revised RI Report, TBE to edit and resubmit the final RI Report to SIRS.
	TBE will prepare and submit a draft Long Term Stewardship Plan to DNREC SIRS
December 2015	Upon receipt of DNREC LTS Plan comments, TBE will edit and submit the Final LTS Plan to DNREC.
	TBE will prepare and submit a draft Environmental Covenant to SIRS, edit and submit the Final EC for approval then recordation.

This report has been prepared in accordance with our understanding of generally accepted geological and engineering principles and practices. The conclusions and recommendations are based on our professional evaluation of indicated subsurface conditions as summarized herein. The professional judgments and opinions stated herein are based on current, local standards of practice and have been developed within the scope of work and budget designated for this effort. While generalized subsurface conditions have been inferred through interpolation and/or extrapolation of these data, subsurface conditions beyond those observed during the exploration are, in fact, unknown. The observations, conclusions, and recommendations presented in this report are based solely on conditions encountered at the time of our assessment. Latent conditions and other contingencies bearing upon the environmental condition of the site may be evident in the future.

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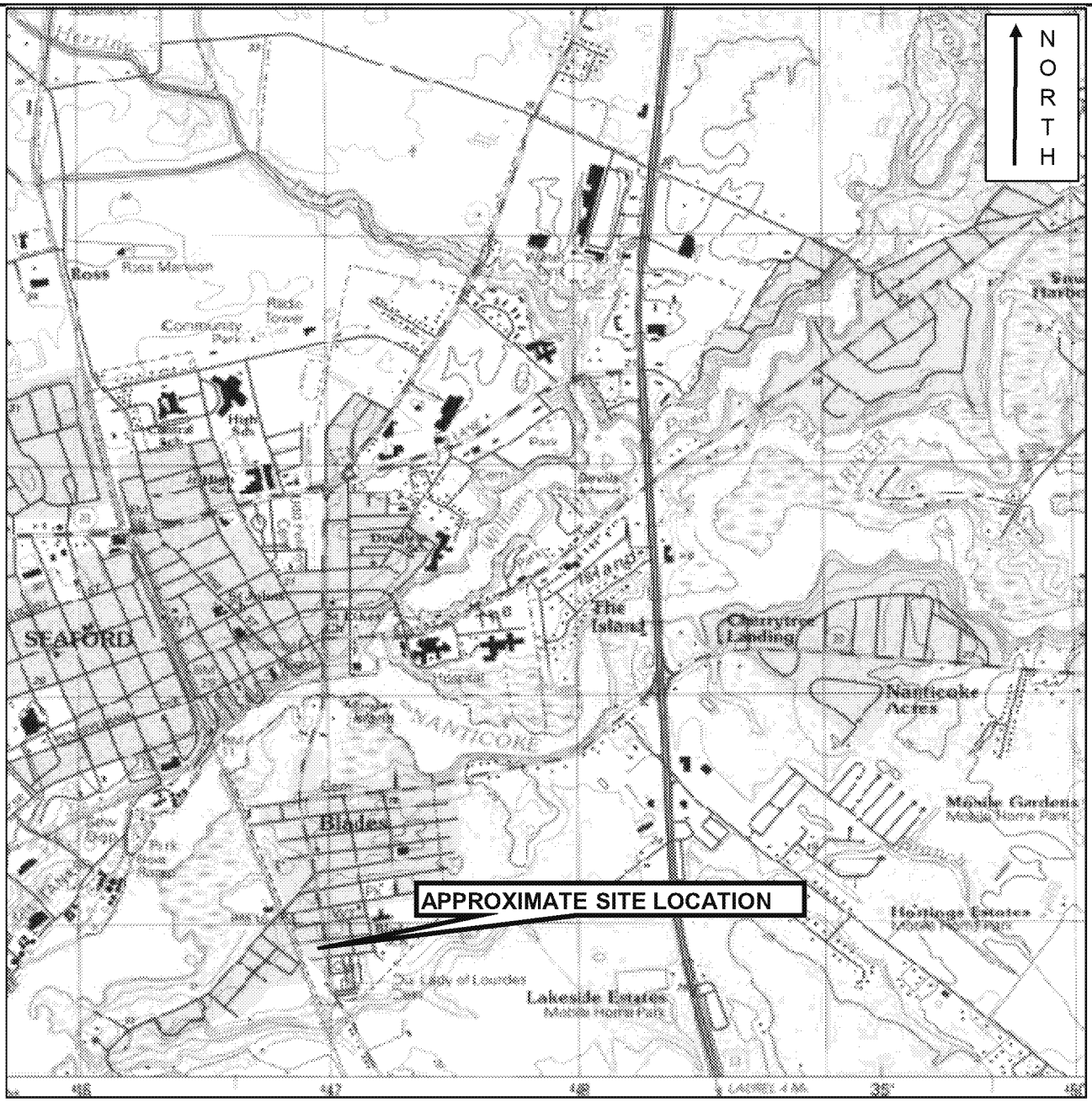
FIGURES



This location sketch was adapted from the USGS Topographic Map
for the Seaford East Quadrangle, Sussex County, Delaware (1992)

Ten Bears Environmental

Ten Bears Environmental
1080 South Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

FIGURE 1 - SITE LOCATION MAP

PROCINO PLATING PROPERTY

901 SOUTH MARKET STREET

BLADES, SUSSEX COUNTY, DELAWARE

DATE:	5/28/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	BKG	SCALE:	1 inch = approx 2,000 feet
CHECKED BY:	EWR	FIGURE NO:	1
FILE NO:	11-1027.AFIGS	SHEET 1 OF 1	

Ex. 9 Wells

0 400 800 1,600 2,400 3,200 Feet

Procino Plating Site

Preexisting Deep Well

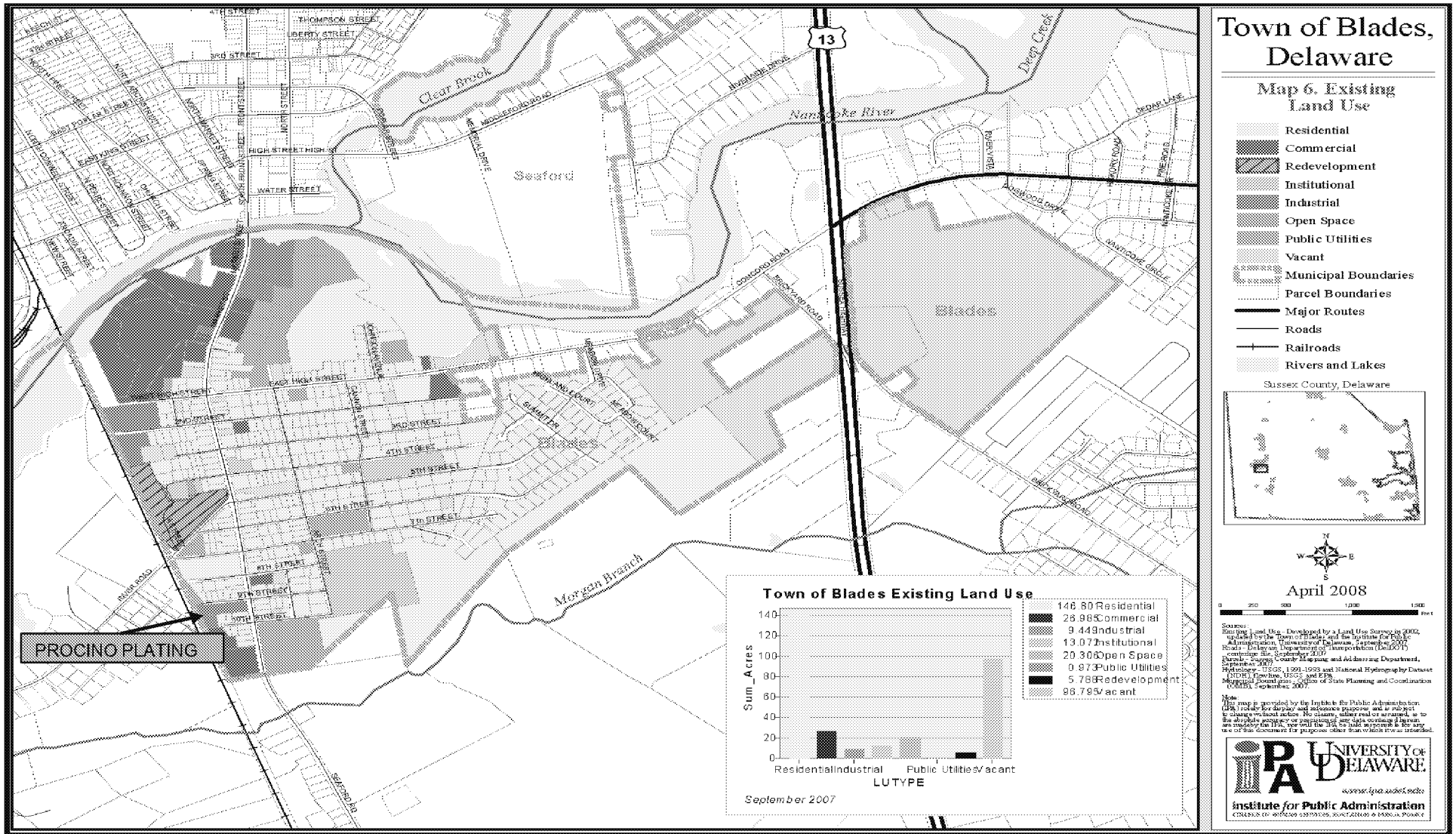
(from Sussex County, Delaware Tax Parcel Map)

Ten Bears Environmental

Ten Bears Environmental
1080 S. Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

FIGURE 2 - SITE VICINITY MAP
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	6/10/2013	JOB NUMBER:	12-1027.C
DRAWN BY:	BKG	SCALE:	as noted
CHECKED BY:	EWR	FIGURE NO:	2
FILE NO:	12-1027.CFIG5	SHEET 1 OF 1	



Ten Bears Environmental

Ten Bears Environmental
1080 South Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

FIGURE 3 - TOWN OF BLADES - LAND USES
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

DATE:	8/1/2013	JOB NUMBER:	11-1027.C
DRAWN BY:	BKG	SCALE:	as shown
CHECKED BY:	EWR	FIGURE NO:	3
FILE NO:	111027.C	SHEET 1 OF 1	

Ten Bears Environmental

Ten Bears Environmental
1080 South Chapel Street
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FIGURE 4 - TOWN OF BLADES - ANNEXATION AREAS
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

DATE:	8/1/2013	JOB NUMBER:	11-1027.C
DRAWN BY:	BKG	SCALE:	as shown
CHECKED BY:	EWR	FIGURE NO:	4
FILE NO:	111027.C	SHEET 1 OF 1	

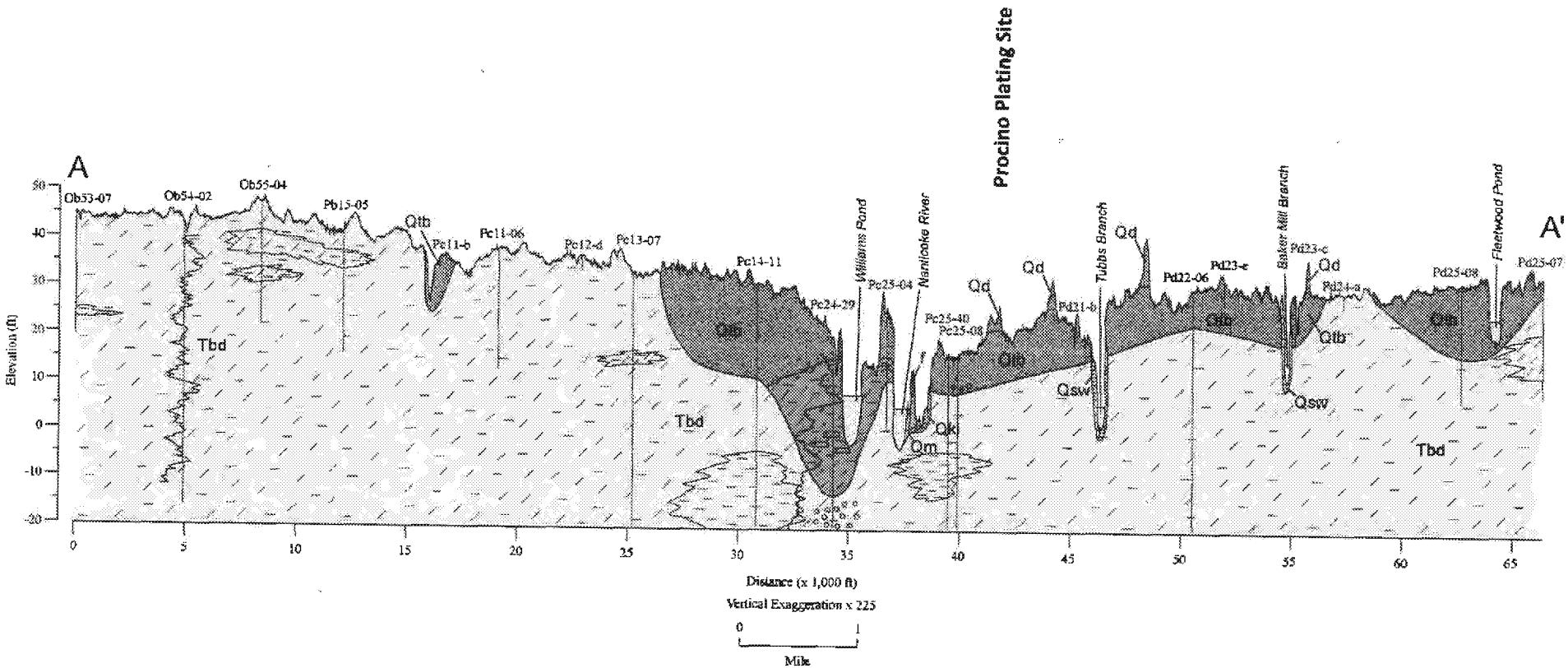

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FIGURE 5 - GENERAL GEOLOGIC SETTING
(from Delaware Geologic Survey, Geologic Map #23, 2015)
PROCINO PLATING PROPERTY
TOWN OF BLADES, SUSSEX COUNTY, DELAWARE

DATE:	9/16/2015	JOB NUMBER:	12-1027.C
DRAWN BY:	EWR	SCALE:	as shown
CHECKED BY:	RCG	FIGURE NO:	5
FILE NO:	121027.C	SHEET 1 OF 1	

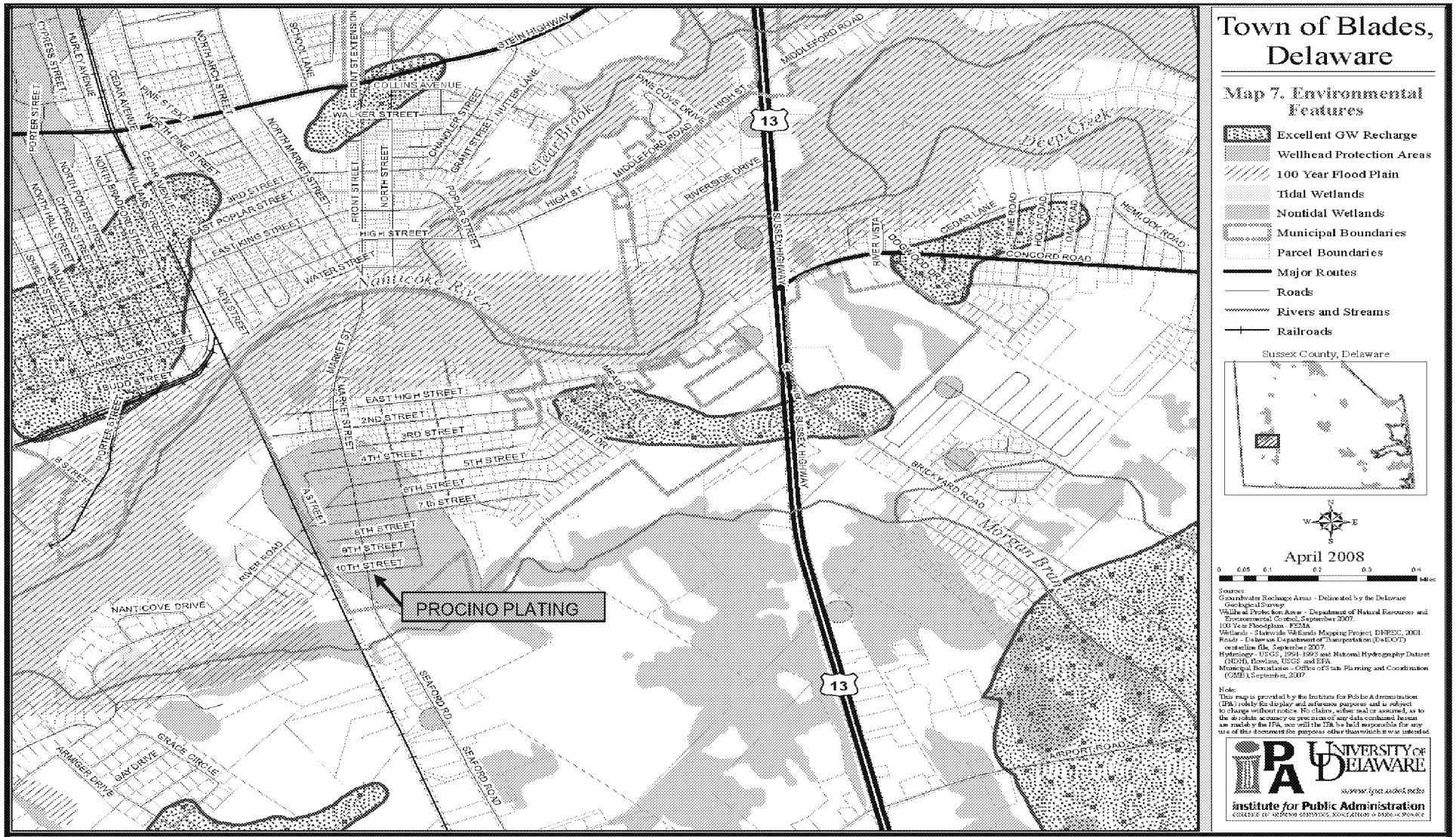

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FIGURE 6 - TOWN OF BLADES - ENVIRONMENTAL FEATURES
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

DATE:	8/1/2013	JOB NUMBER:	11-1027.C
DRAWN BY:	BKG	SCALE:	as shown
CHECKED BY:	EWR	FIGURE NO:	6
FILE NO:	111027.C	SHEET 1 OF 1	

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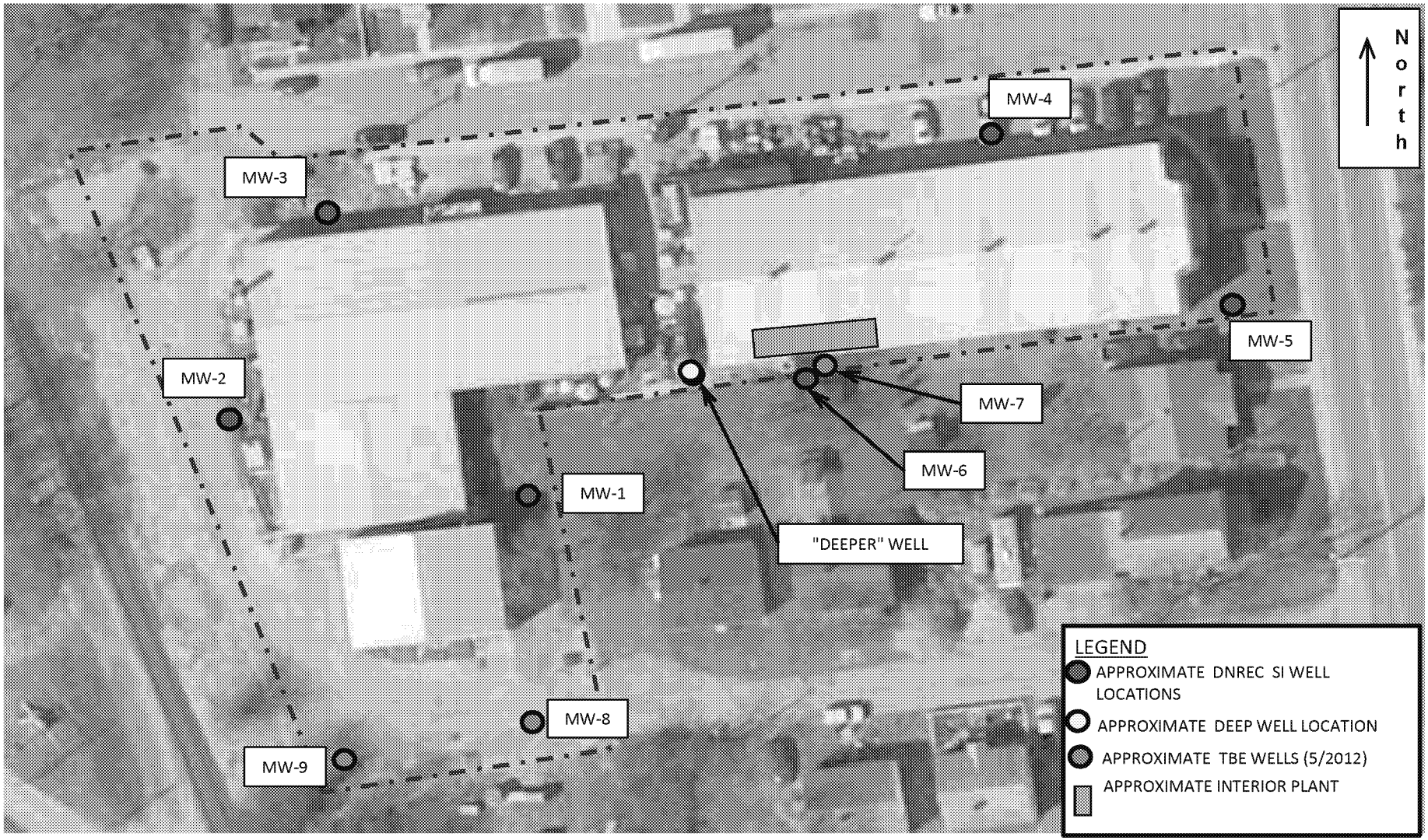
FIGURE 7- DNREC SAMPLE LOCATIONS, 2011 SITE INSPECTION

PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	5/28/2015	JOB NUMBER:	12-1027.C
DRAWN BY:	BKG	SCALE:	0 240 ft
CHECKED BY:	EWR	FIGURE NO:	7
FILE NO:	12-1027.CFIG7	SHEET 1 OF 1	



Note: This drawing was adapted from a 2007 aerial photograph obtained from the Delaware DataMIL Internet site.

FIGURE 8 - RI PHASE I SAMPLING LOCATIONS (MAY, 2012)
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

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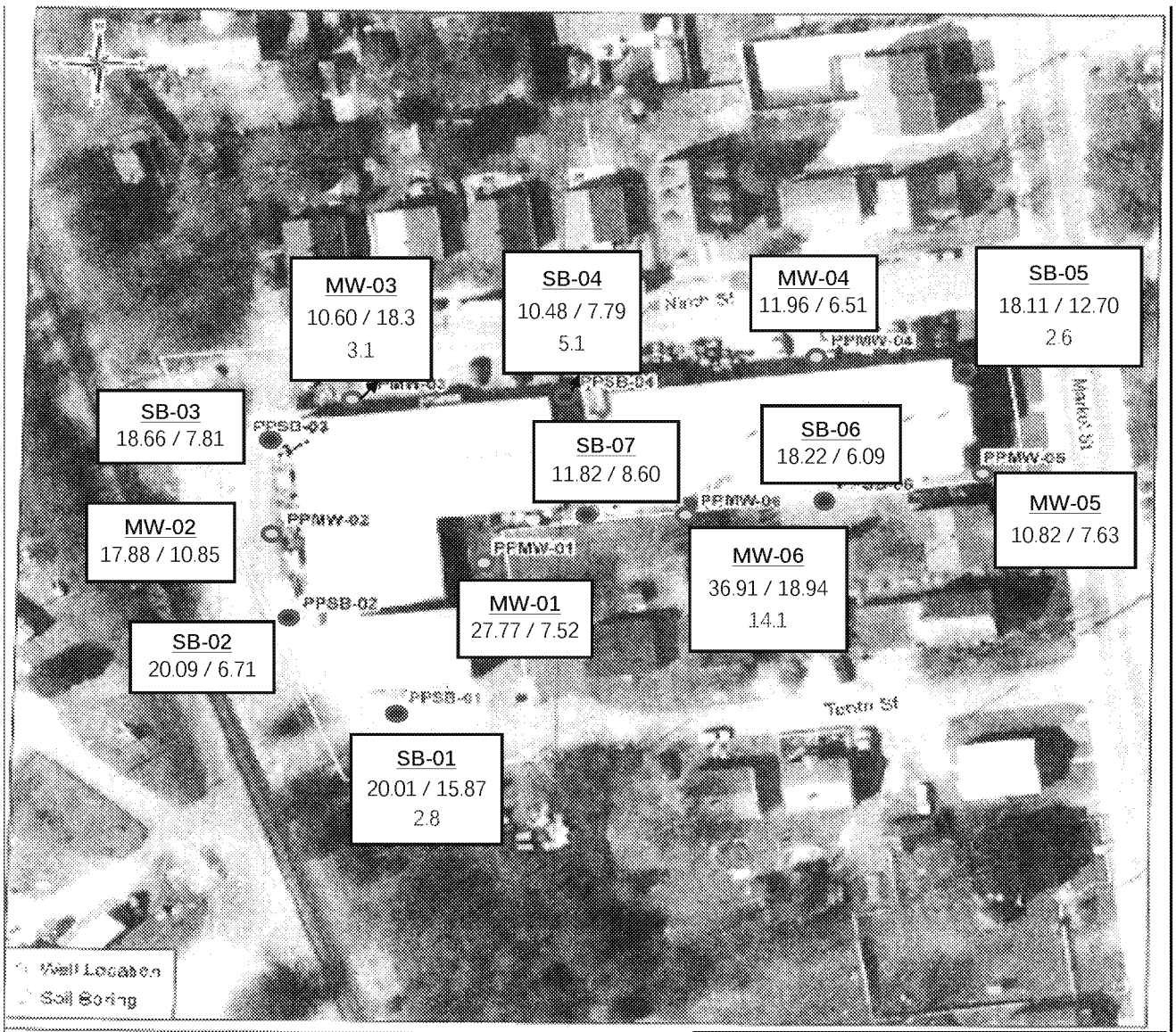
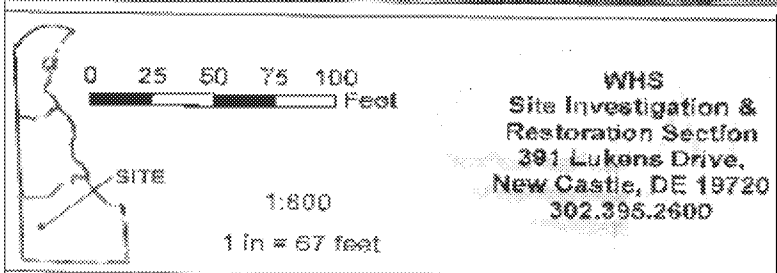
DATE:	5/30/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	KJL	SCALE:	1" = approx. 50'
CHECKED BY:	EWR	FIGURE NO:	8
FILE NO:	111027B.FIG	SHEET 1 OF 1	





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Restoration Section
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302.395.2600

LEGEND

MW-06 MONITOR WELL BORING

SB-01 SOIL BORING LOCATION

14.1 / 10.6 SIRS LAB CHROMIUM in SOIL(mg/kg)
SHALLOW SOIL / DEEP SOIL SAMPLE

14.1 LAB DATA CHROMIUM in SOIL (mg/kg)

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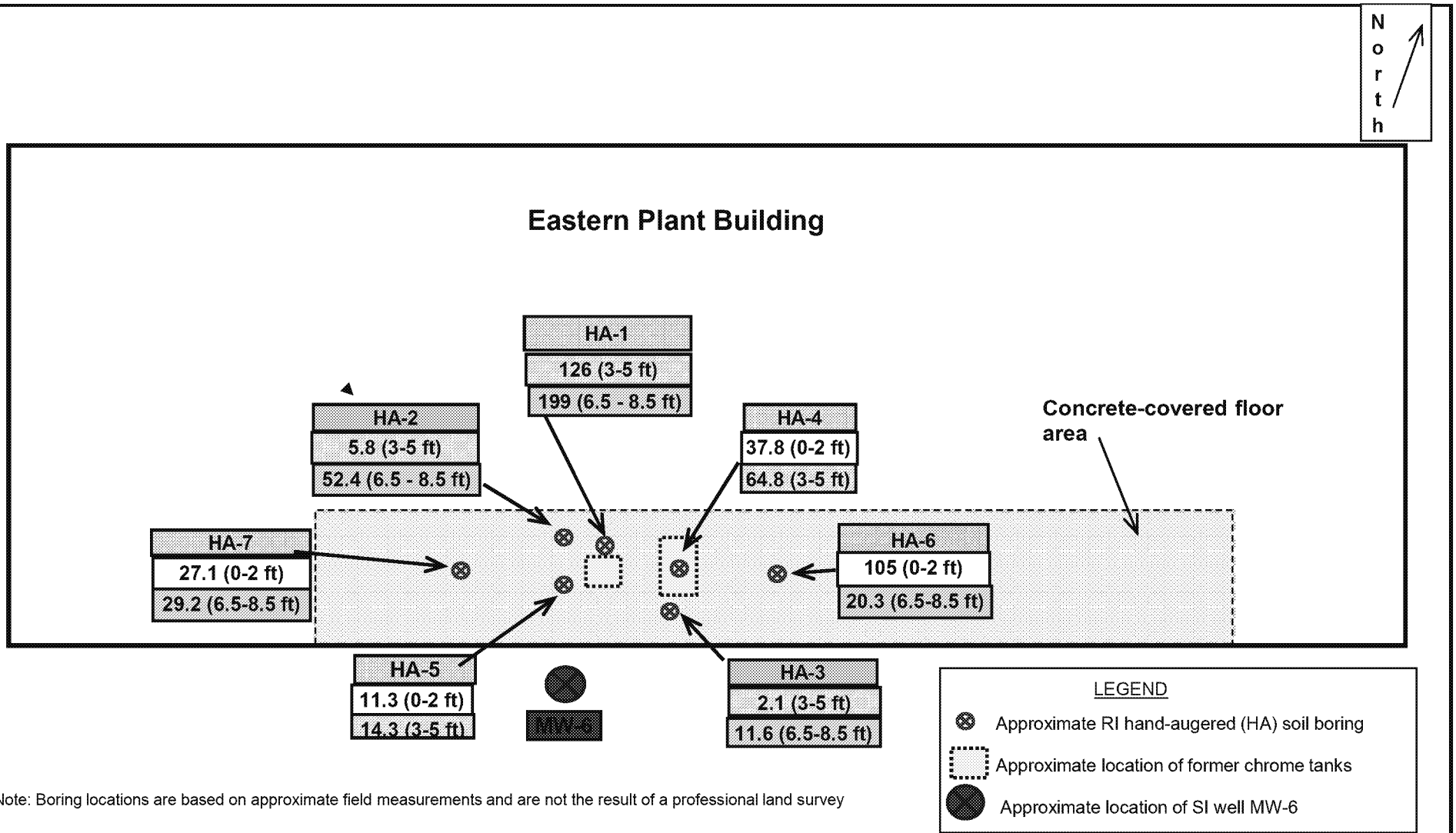
FIGURE 9

TOTAL CHROMIUM IN DNREC SI SOIL SAMPLES, May 2011
PROCINO PLATING PROPERTY
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	05/30/2013	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	as noted
CHECKED BY:	RCG	FIGURE NO:	9
FILE NO:	11-1027.C-FIGS	SHEET	1 OF 1



Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

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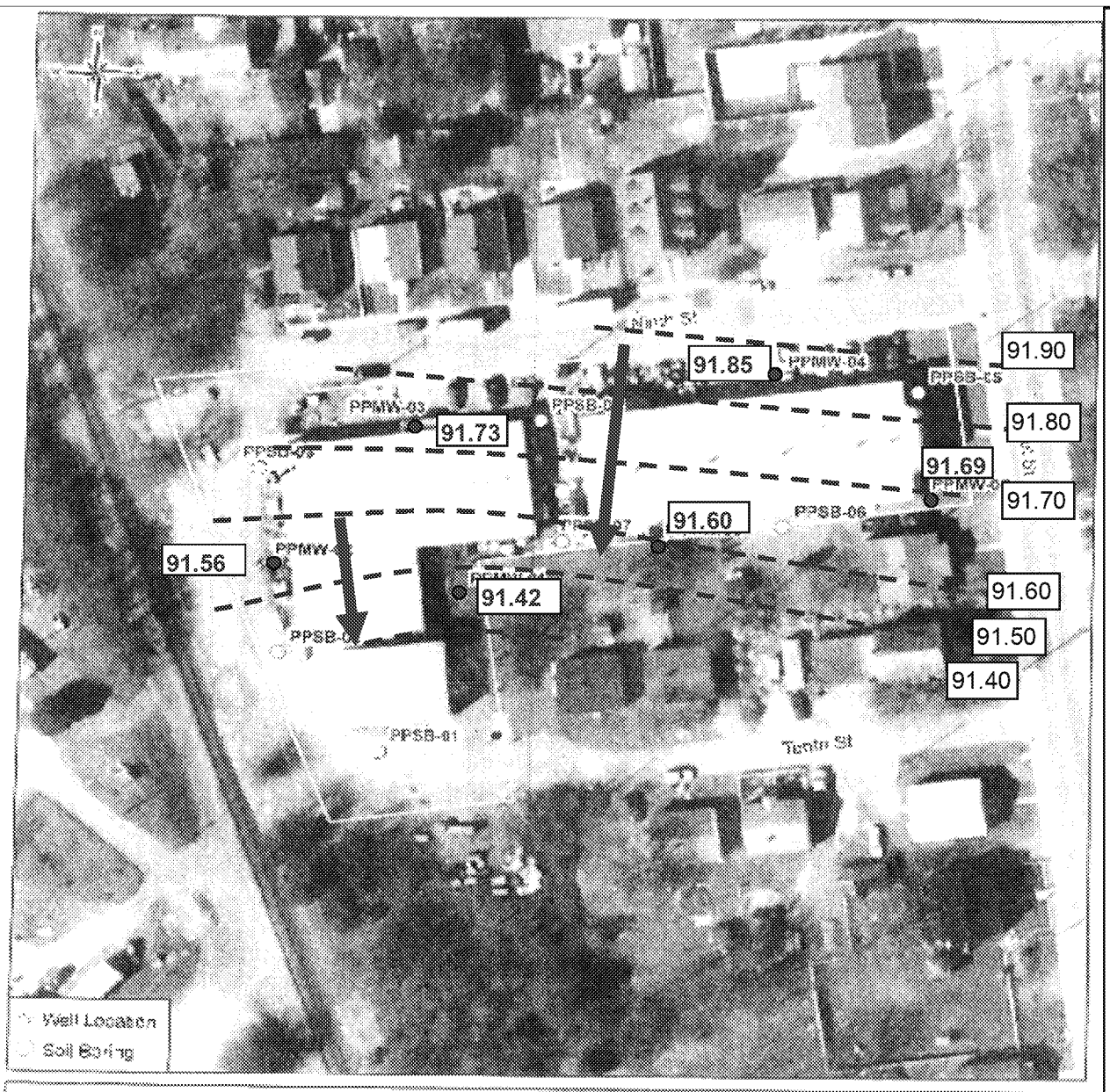
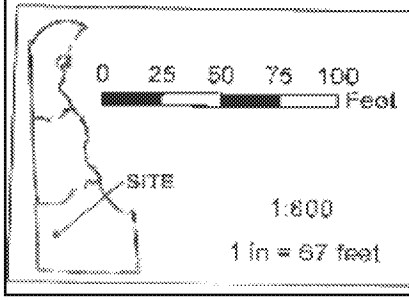
FIGURE 10 - PLANT INTERIOR SOIL SAMPLE CHROMIUM RESULTS (mg/kg)
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

DATE:	5/10/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	BKE	SCALE:	1" = approx. 17'
CHECKED BY:	EWR	FIGURE NO:	10
FILE NO:	111027.FIG	SHEET 1 OF 1	





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● APPROXIMATE MONITOR WELL LOCATION

91.42 RELATIVE SHALLOW GROUNDWATER ELEVATION (as MEASURED BY DNREC-SIRS)

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FIGURE 11- SHALLOW GROUNDWATER ELEVATIONS (DNREC-SIRS) and FLOW DIRECTION (TBE)
PROCINO PLATING PROPERTY (May 2011)
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	5/23/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	EWR	SCALE:	as noted
CHECKED BY:	JMM	FIGURE NO:	11
FILE NO:	11-1027-FIGS	SHEET	1 OF 1

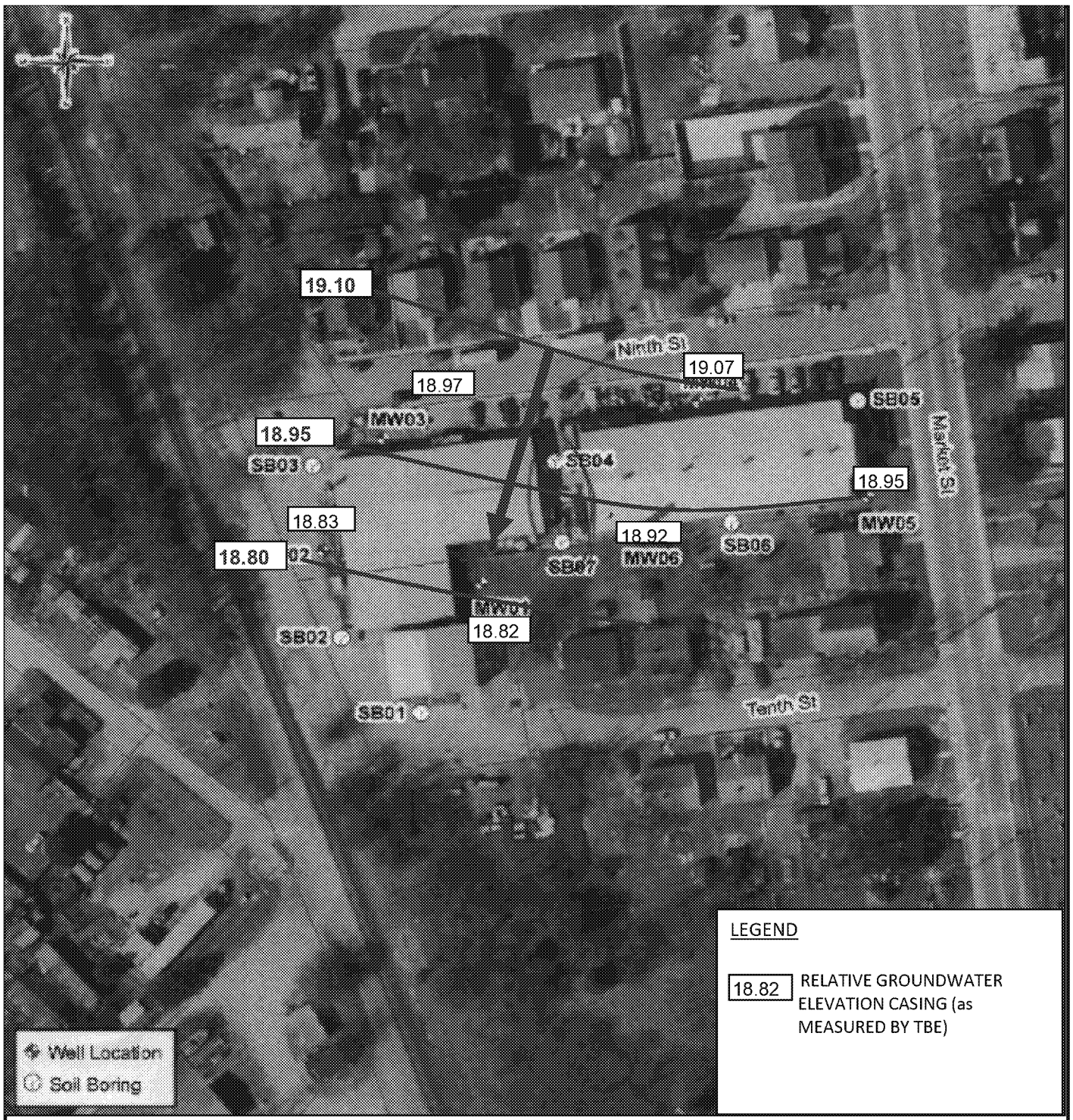

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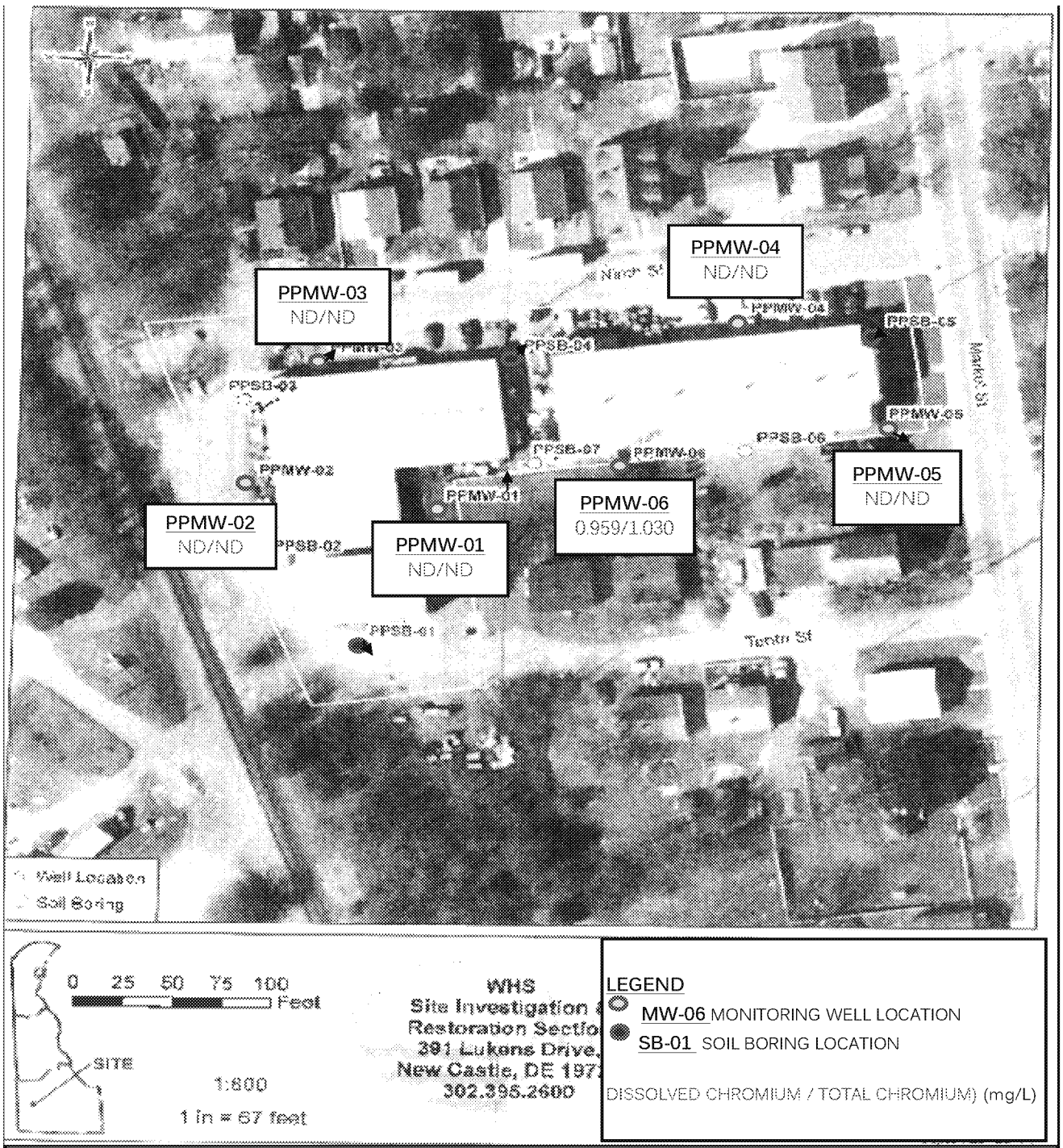
FIGURE 12 - SHALLOW GROUNDWATER FLOW DIRECTION

PROCINO PLATING PROPERTY (4/19/2012)

901 SOUTH MARKET STREET

BLADES, SUSSEX COUNTY, DELAWARE

DATE:	5/23/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	EWR	SCALE:	as noted
CHECKED BY:	JMM	FIGURE NO:	12
FILE NO:	11-1027-FIGS	SHEET 1 OF 1	



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LEGEND
MW-06 MONITORING WELL LOCATION
SB-01 SOIL BORING LOCATION

DISSOLVED CHROMIUM / TOTAL CHROMIUM) (mg/L)

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FIGURE 13

TOTAL CHROMIUM IN DNREC SI GROUNDWATER SAMPLES, May 2011
PROCINO PLATING PROPERTY
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	05/30/2013	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	as noted
CHECKED BY:	JMM	FIGURE NO:	13
FILE NO:	11-1027.C-FIGS	SHEET	1 OF 1

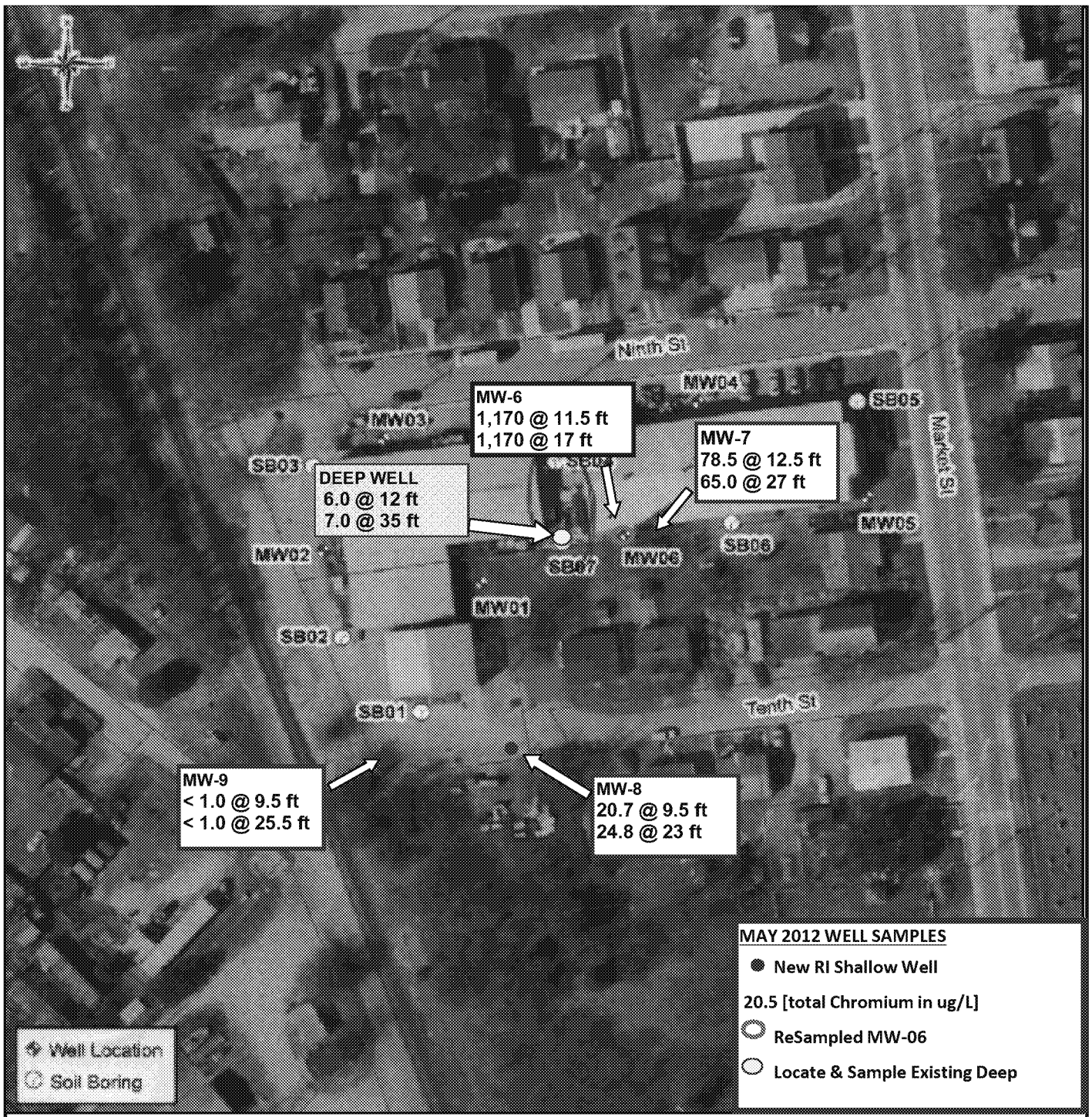

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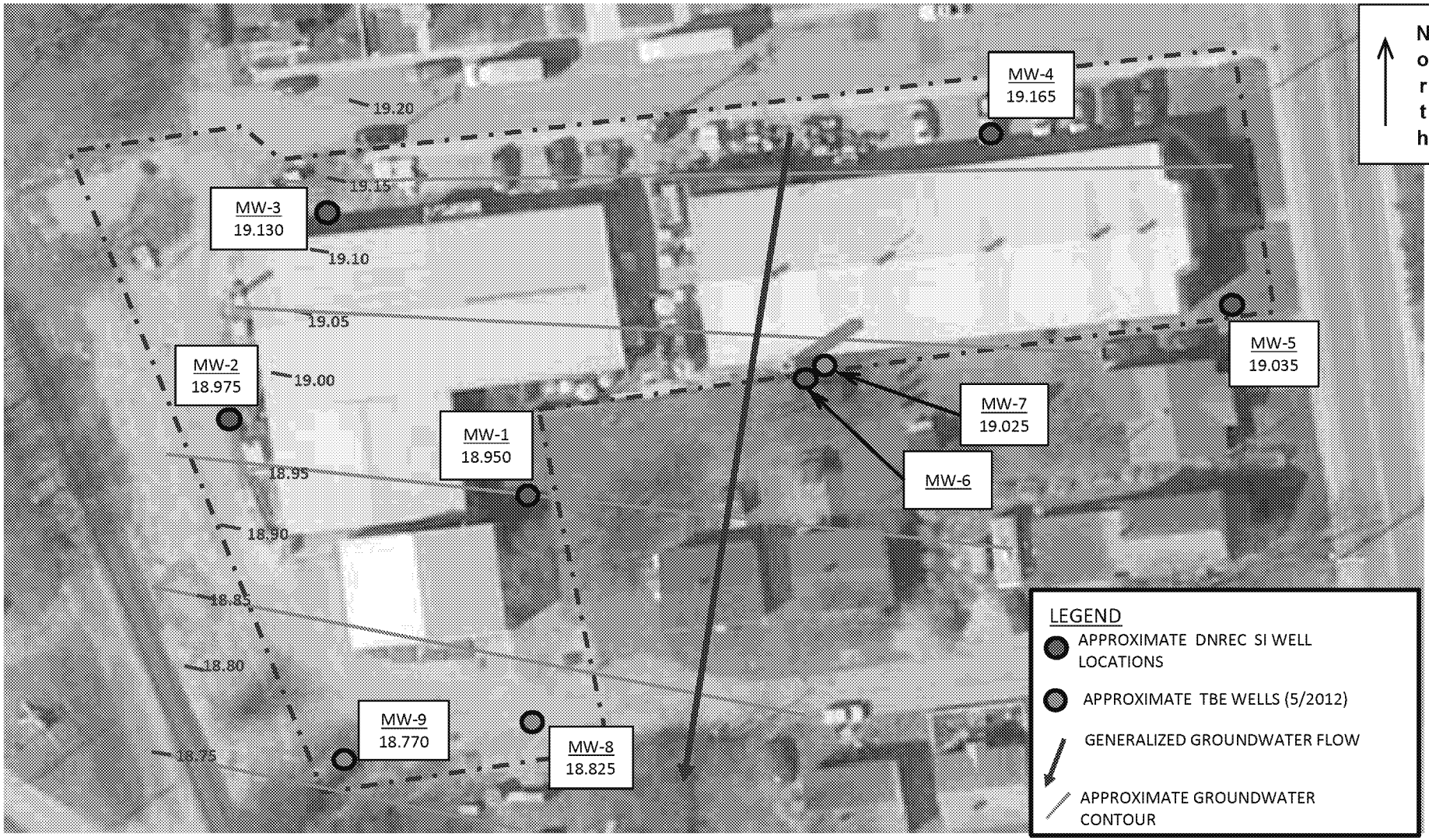
FIGURE 14 - TOTAL CHROMIUM in GROUNDWATER (5/2012)
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	5/23/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	EWR	SCALE:	as noted
CHECKED BY:	JMM	FIGURE NO:	14
FILE NO:	11-1027.A-FIGS	SHEET	1 OF 1



Note: This drawing was adapted from a 2007 aerial photograph obtained from the Delaware DataMIL Internet site.

FIGURE 15 - SHALLOW GROUNDWATER FLOW DIRECTION (May 9, 2012)
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

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DATE:	5/30/2012	JOB NUMBER:	11-1027.B
DRAWN BY:	EWR	SCALE:	1" = approx. 50'
CHECKED BY:	JMM	FIGURE NO:	15
FILE NO:	111027B.WLFIG	SHEET 1 OF 1	

Ex. 9 Wells & Ex. 6 Personal Privacy

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FIGURE 16 - APPROXIMATE CHROMIUM ISOCONCENTRATIONS IN SHALLOW GROUNDWATER (May 2012)

PROCINO PLATING PROPERTY

BLADES, SUSSEX COUNTY, DELAWARE

DATE: 5/28/2015	JOB NUMBER: 11-1027.B
DRAWN BY: EWR	SCALE: 1 inch = approx 110 feet
CHECKED BY: RCG	FIGURE NO: 16
FILE NO: 11-1027.A-FIGS	SHEET 1 OF 1

Ex. 9 Wells & Ex. 6 Personal Privacy

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FIGURE 17 - RI PHASE II GROUNDWATER SAMPLING LOCATIONS

PROCINO PLATING PROPERTY

BLADES, SUSSEX COUNTY, DELAWARE

DATE:	05/28/2015	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	1 inch = approx. 110 feet
CHECKED BY:	RCG	FIGURE NO:	17
FILE NO:	11-1027.C-FIGS	SHEET 1 OF 1	

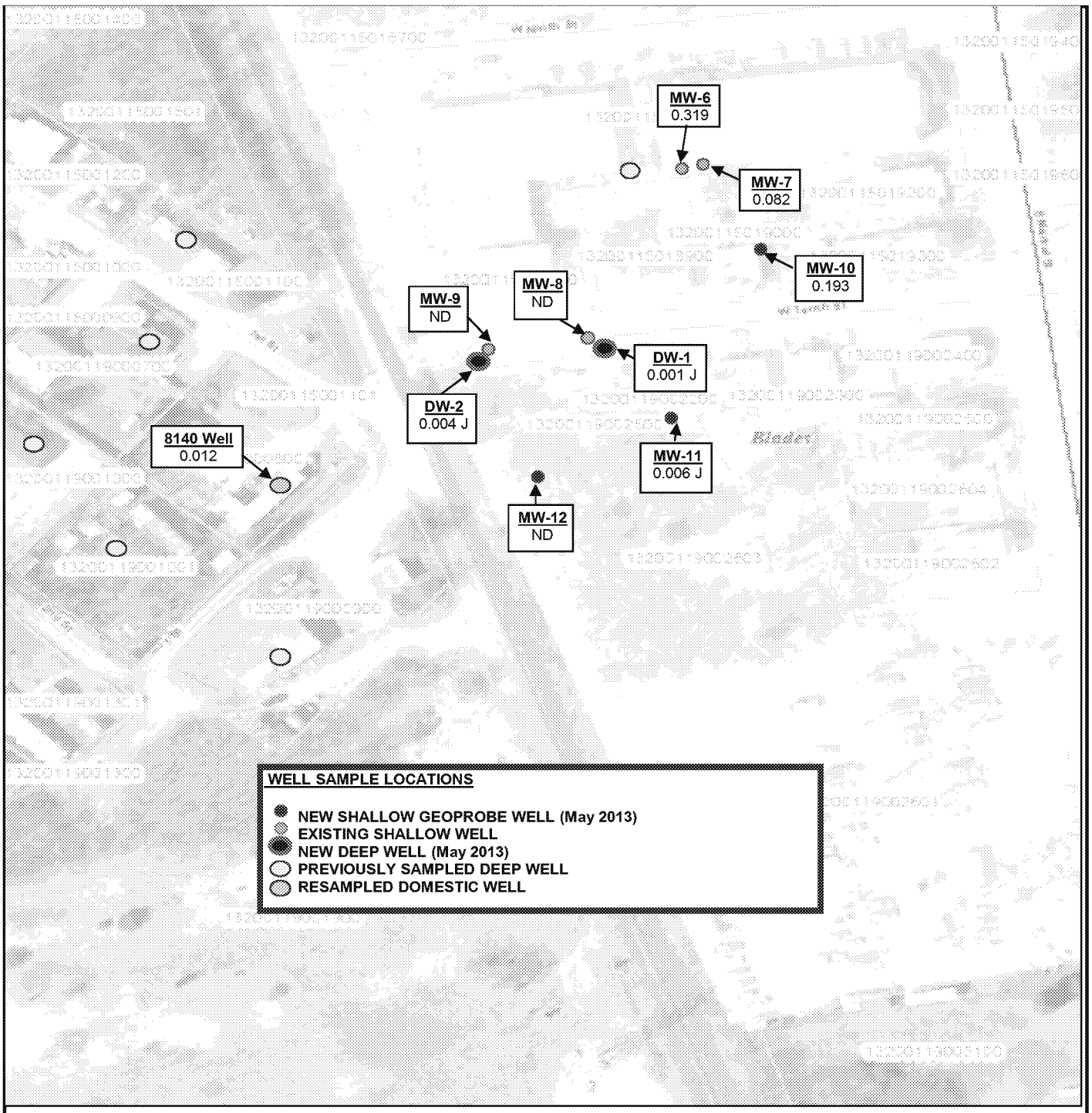

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FIGURE 18

TOTAL CHROMIUM IN GROUNDWATER SAMPLES, May 2013 (mg/L)

PROCINO PLATING PROPERTY

BLADES, SUSSEX COUNTY, DELAWARE

DATE:	05/28/2015	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	1 inch = approx. 110 feet
CHECKED BY:	RCG	FIGURE NO:	18
FILE NO:	11-1027.C-FIGS	SHEET 1 OF 1	

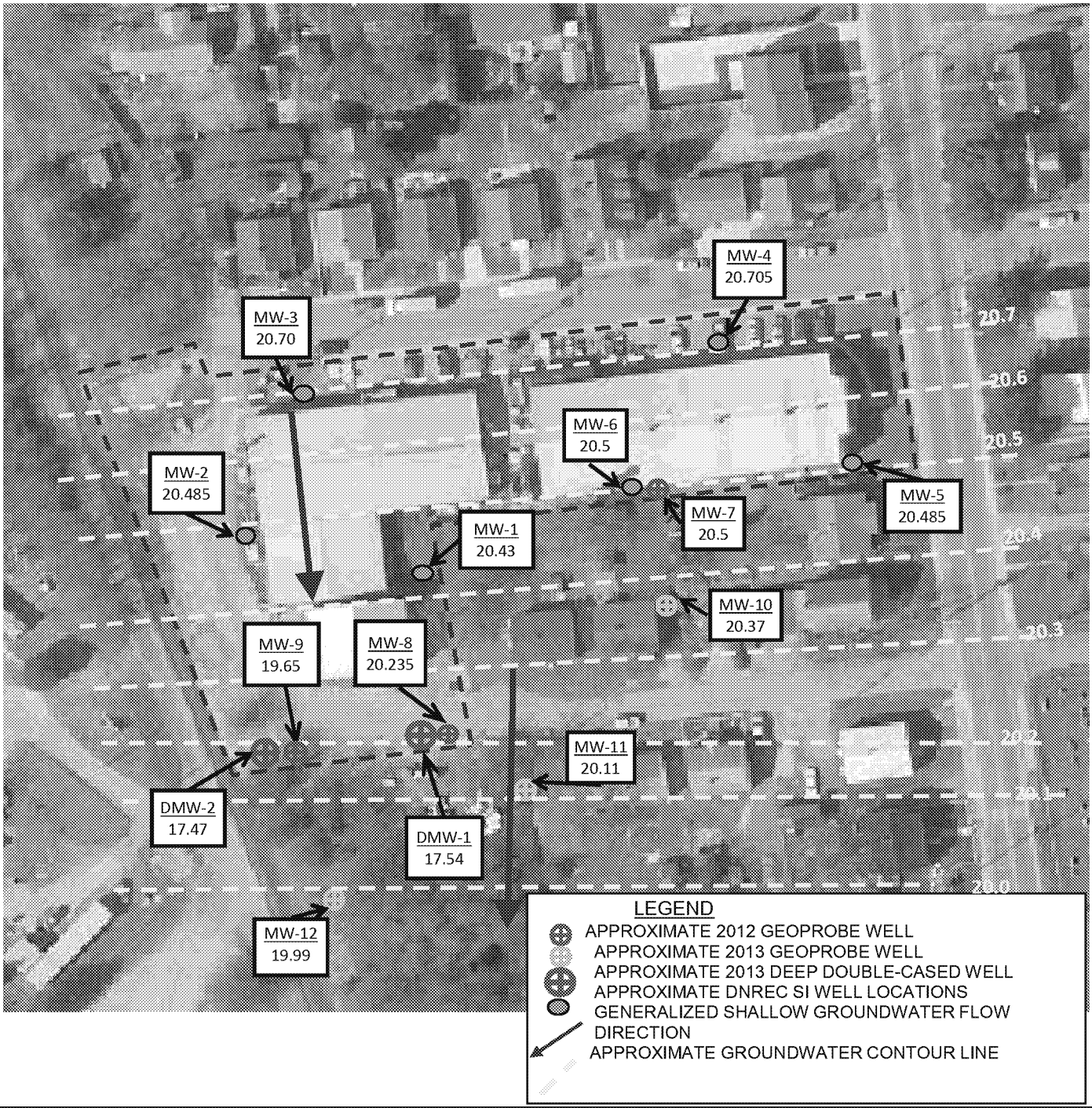

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FIGURE 19- SHALLOW GROUNDWATER FLOW DIRECTION (May 9, 2013)

PROCINO PLATING PROPERTY

901 SOUTH MARKET STREET

TOWN OF BLADES, DELAWARE

DATE:	05/28/2015	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	1 inch = approx. 115 feet
CHECKED BY:	RCG	FIGURE NO:	19
FILE NO:	111027.C	SHEET 1 OF 1	

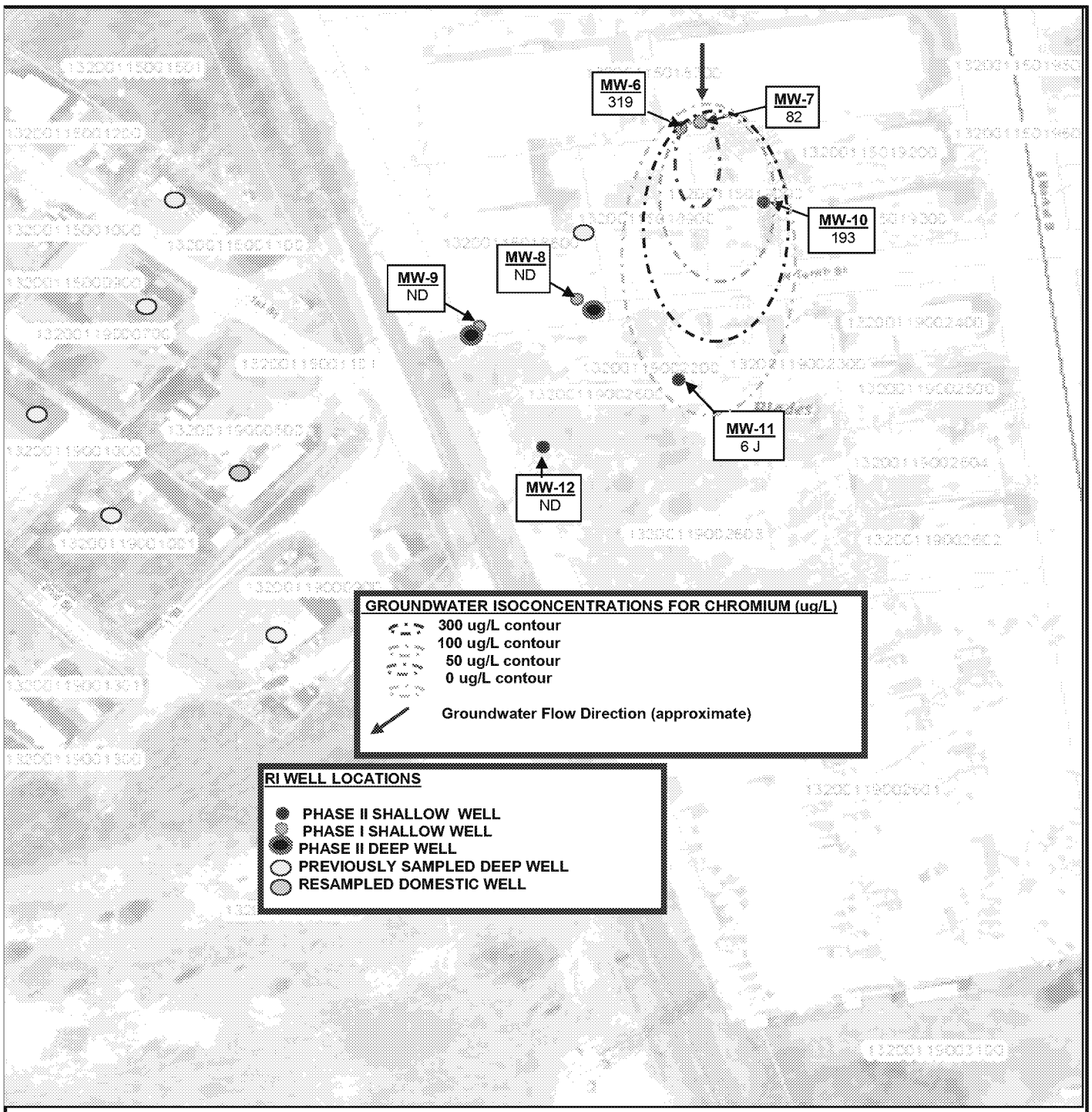

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FIGURE 20 - APPROXIMATE CHROMIUM ISOCONCENTRATIONS IN SHALLOW GROUNDWATER SAMPLES, May 2013 (ug/L)

PROCINO PLATING PROPERTY

BLADES, SUSSEX COUNTY, DELAWARE

DATE:	05/28/2015	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	1 inch = approx. 110 feet
CHECKED BY:	RCG	FIGURE NO:	20
FILE NO:	11-1027.C-FIGS	SHEET	1 OF 1

LEGEND

APPROXIMATE DNREC SI WELL LOCATIONS
APPROXIMATE 2012 GEOPROBE WELL
APPROXIMATE 2013 GEOPROBE WELL
APPROXIMATE 2013 HSA DOUBLE-CASED WELL

TOTAL CHROMIUM 5/29/2014 (µg/L)
ND = below MDL of 1.6 µg/L
TOTAL CYANIDE 5/29/2014 (µg/L)
ND = below MDL of 5.0 µg/L

GENERALIZED SHALLOW GROUNDWATER FLOW DIRECTION (RELATIVE ELEVATION, May 2014)

Ex. 9 Wells & Ex. 6 Personal Privacy

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FIGURE 21 - GROUNDWATER CHROMIUM & CYANIDE RESULTS (May 29, 2014)

PROCINO PLATING PROPERTY

901 SOUTH MARKET STREET

TOWN OF BLADES, DELAWARE

DATE:	6/12/2014	JOB NUMBER:	11-1027.C
DRAWN BY:	EWR	SCALE:	0 — 100 ft
CHECKED BY:	RCG	FIGURE NO:	21
FILE NO:	111027.C	SHEET	1 OF 1

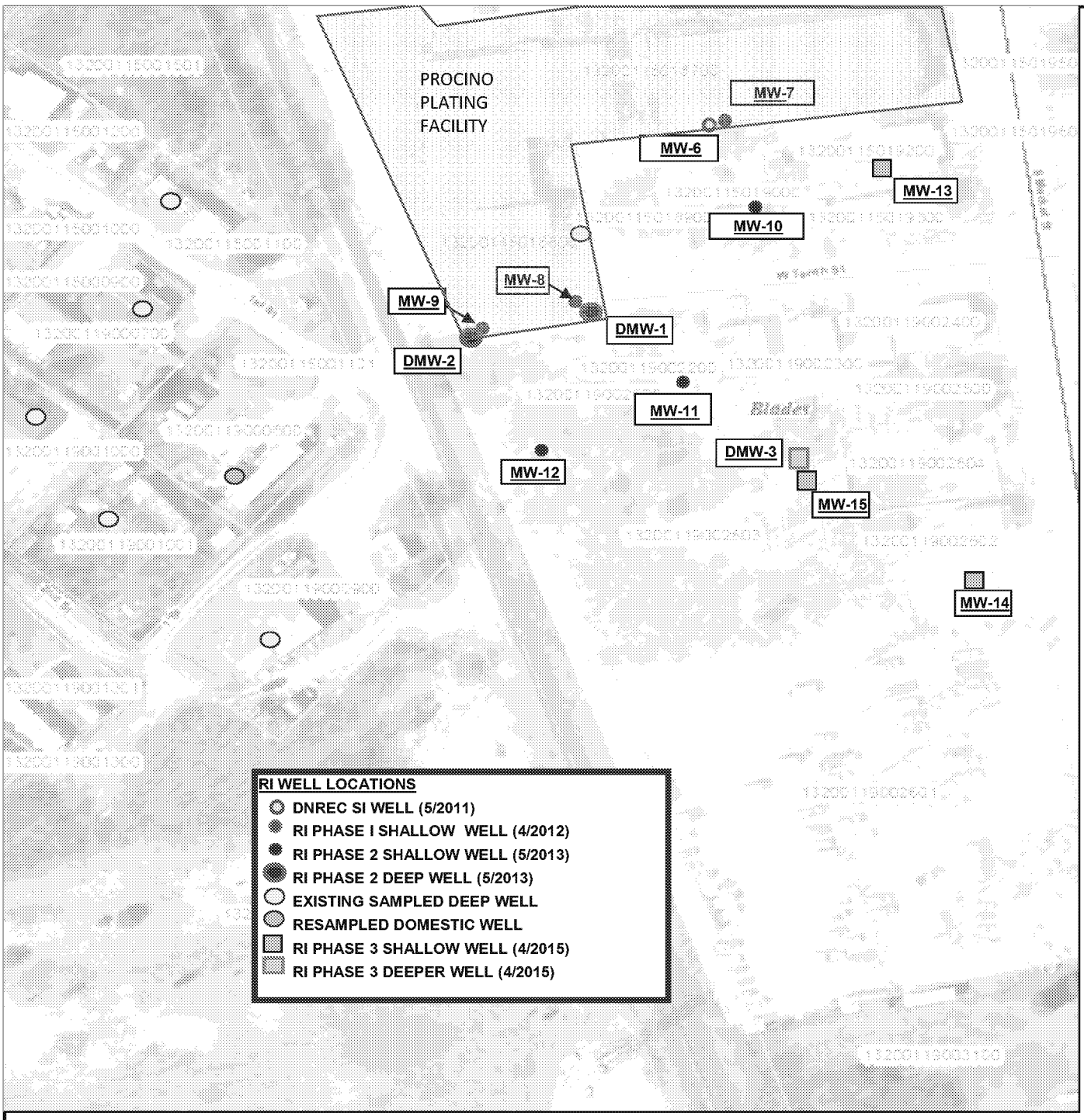

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FIGURE 22 - EXPANDED RI GROUNDWATER EVALUATION WELL LOCATIONS (May 2015)
REMEDIAL INVESTIGATION
PROCINO PLATING FACILITY (DE-0344)
BLADES, SUSSEX COUNTY, DELAWARE

DATE: 05/19/2015	JOB NUMBER: 11-1027.C
DRAWN BY: EWR	SCALE: 1 INCH = 100 FEET (APPX)
CHECKED BY: RCG	FIGURE NO: 22
FILE NO: 11-1027.C-FIGS	SHEET 1 OF 1

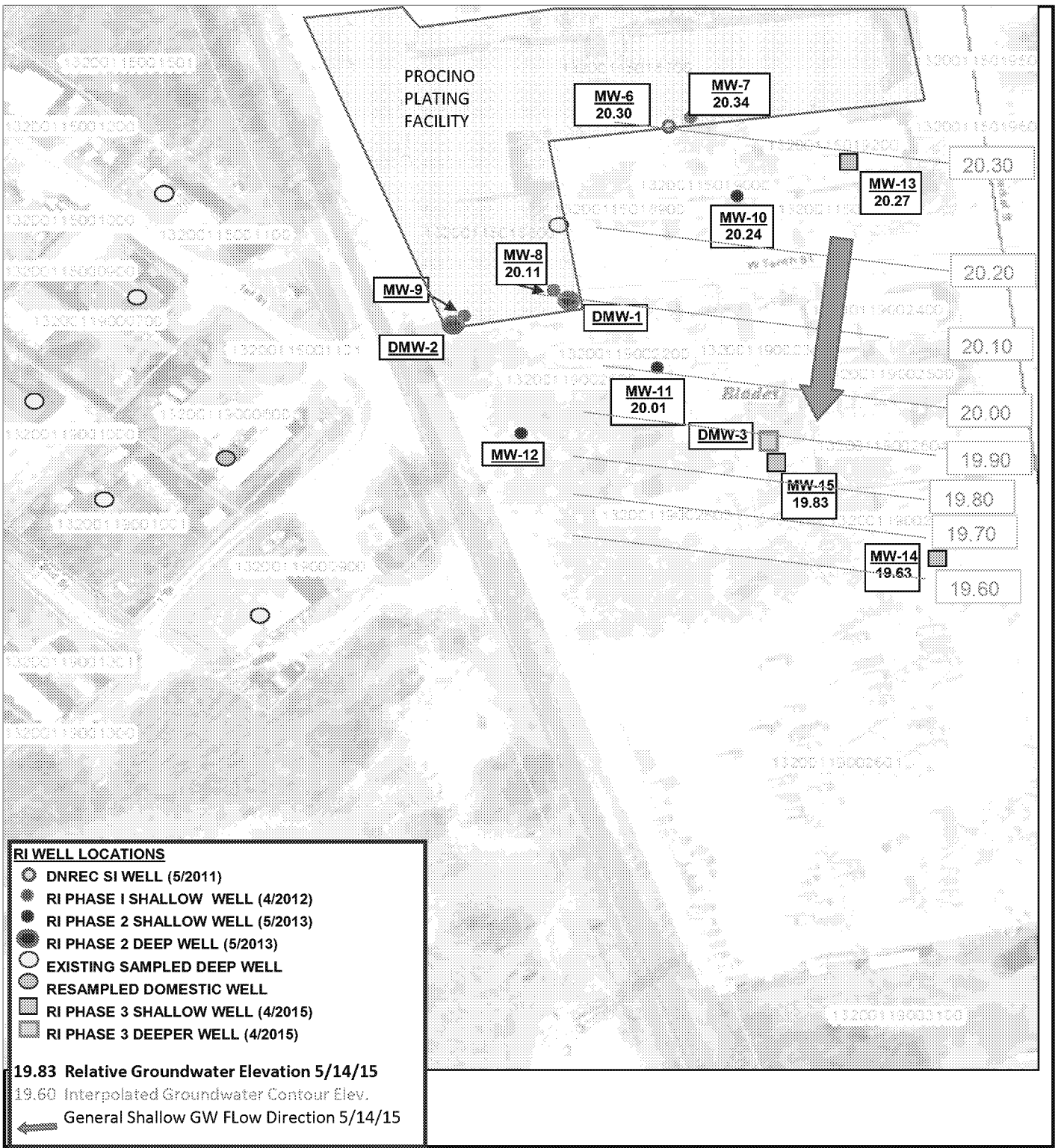

FIGURE 23 - GROUNDWATER ELEVATION & SHALLOW FLOW DIRECTION (5/14/2015)
REMEDIAL INVESTIGATION
PROCINO PLATING FACILITY (DE-0344)
BLADES, SUSSEX COUNTY, DELAWARE

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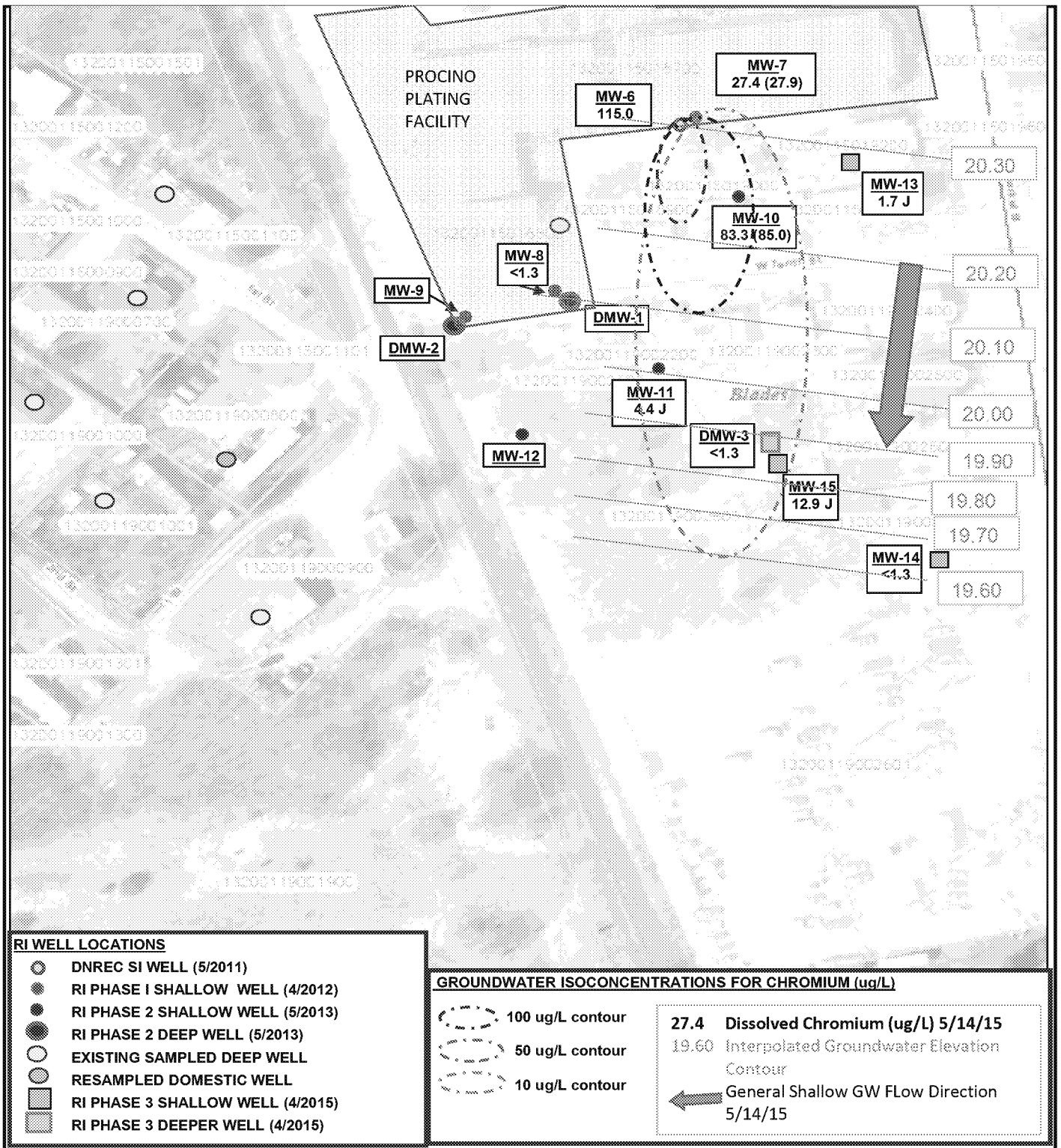
DATE: 05/21/2015	JOB NUMBER: 11-1027.C
DRAWN BY: EWR	SCALE: 1 INCH = 100 FEET (APPX)
CHECKED BY: RCG	FIGURE NO: 23
FILE NO: 11-1027.C-FIGS	SHEET 1 OF 1



RI WELL LOCATIONS

- DNREC SI WELL (5/2011)
- RI PHASE I SHALLOW WELL (4/2012)
- RI PHASE 2 SHALLOW WELL (5/2013)
- RI PHASE 2 DEEP WELL (5/2013)
- EXISTING SAMPLED DEEP WELL
- RESAMPLED DOMESTIC WELL
- RI PHASE 3 SHALLOW WELL (4/2015)
- RI PHASE 3 DEEPER WELL (4/2015)

GROUNDWATER ISOCONCENTRATIONS FOR CHROMIUM (ug/L)

- 100 ug/L contour
- 50 ug/L contour
- 10 ug/L contour

27.4 Dissolved Chromium (ug/L) 5/14/15
19.60 Interpolated Groundwater Elevation Contour
General Shallow GW FLow Direction 5/14/15

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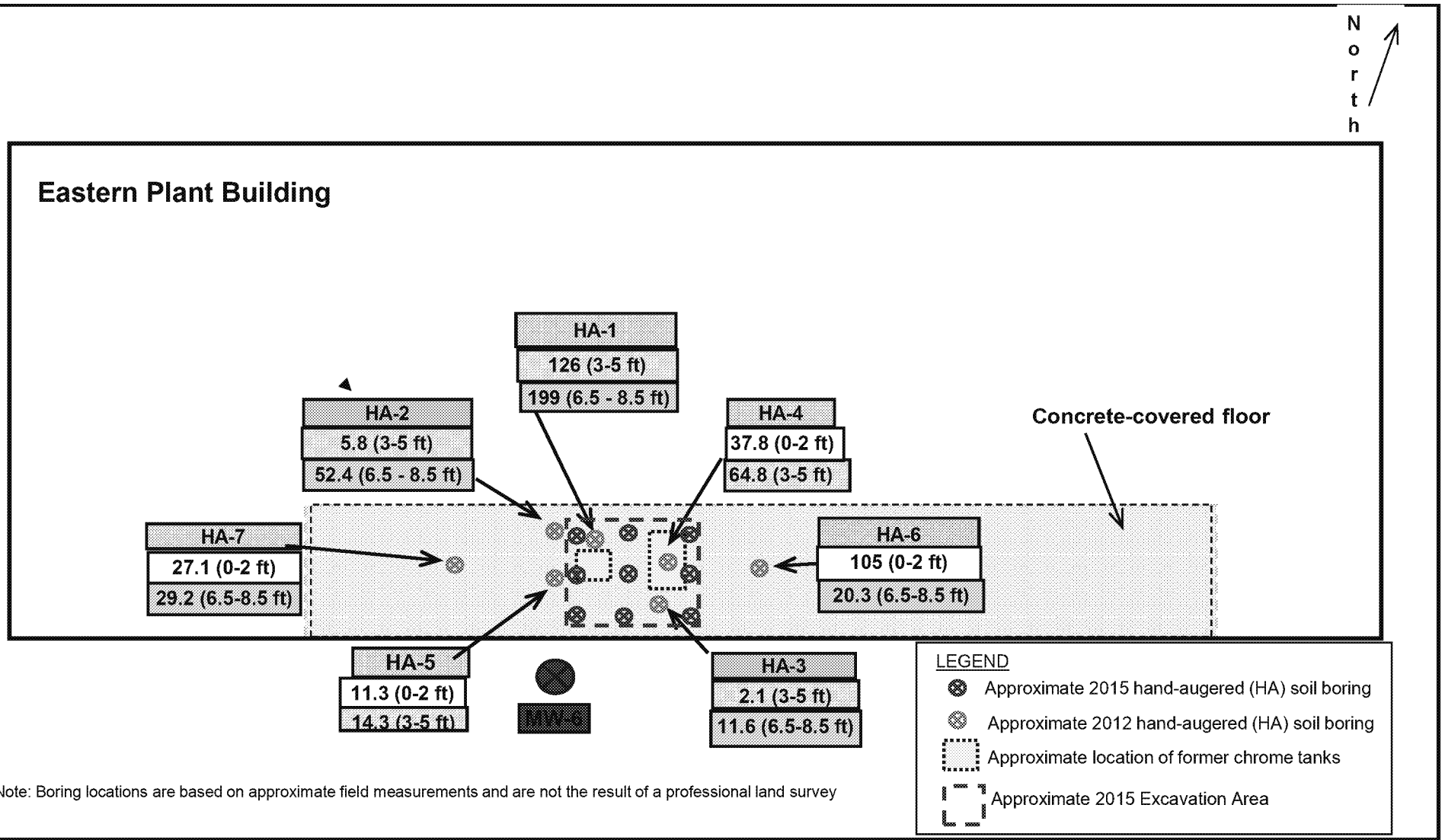
FIGURE 24 - CHROMIUM GROUNDWATER ISOCONCENTRATION MAP (5/14/2015)
REMEDIAL INVESTIGATION
PROCINO PLATING FACILITY (DE-0344)
BLADES, SUSSEX COUNTY, DELAWARE

DATE: 05/27/2015	JOB NUMBER: 11-1027.C
DRAWN BY: EWR	SCALE: 1 INCH = 100 FEET (APPX)
CHECKED BY: RCG	FIGURE NO: 24
FILE NO: 11-1027.C-FIGS	SHEET 1 OF 1



Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

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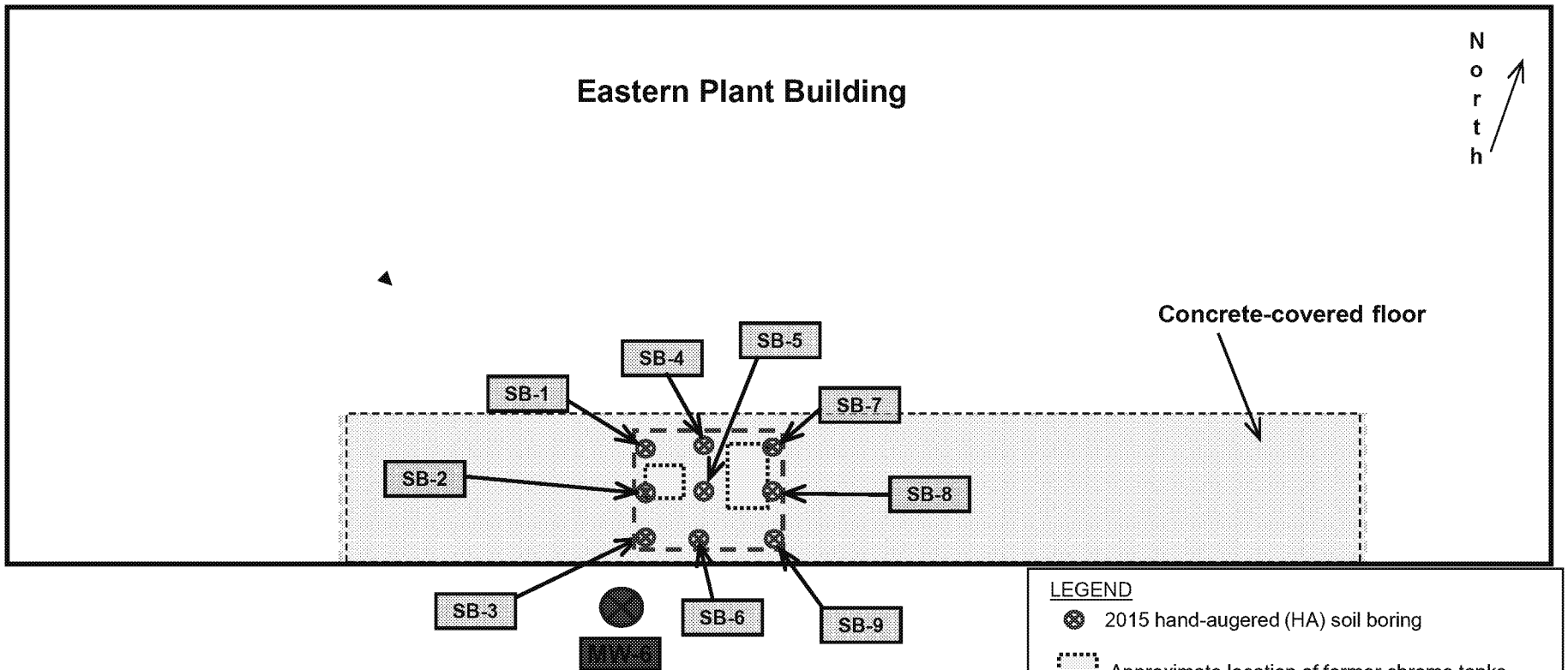
FIGURE 25 - INTERIM ACTION SOIL EXCAVATION AREA
(with 2012 PLANT INTERIOR SOIL SAMPLE CHROMIUM RESULTS (mg/kg))
Procino Plating Property
910 South Market Street, Blades, Delaware

DATE:	8/06/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	BKE	SCALE:	1" = approx. 17'
CHECKED BY:	EWR	FIGURE NO:	25
FILE NO:	111027.FIG	SHEET 1 OF 1	



LEGEND
- 2015 hand-augered (HA) soil boring
- Approximate location of former chrome tanks
- Approximate 2015 Excavation Area

Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

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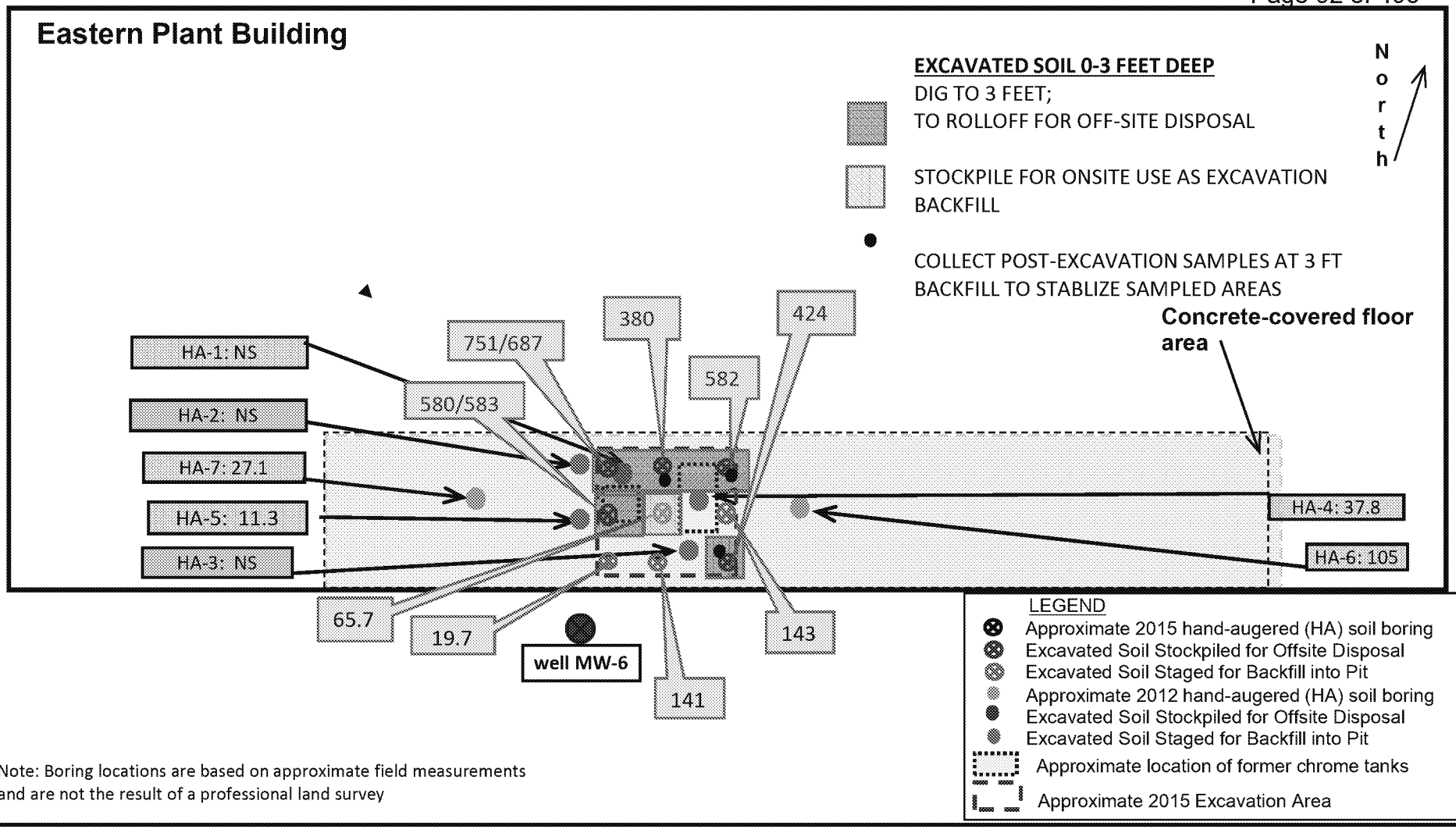
FIGURE 26
2015 SUBSURFACE SOIL CHROMIUM DELINEATION BORING LOCATIONS
Procino Plating Property
910 South Market Street, Blades, Delaware

DATE:	6/30/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	BKE	SCALE:	1" = approx. 17'
CHECKED BY:	EWR	FIGURE NO:	26
FILE NO:	111027.FIG	SHEET 1 OF 1	



Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

FIGURE 27 - TOTAL CHROMIUM IN 2015 SAMPLES (mg/kg) (0-3 FT DEPTH)
with 2012 SAMPLES (0-2 FT) CHROMIUM RESULTS (mg/kg)
Procino Plating Facility
910 South Market Street, Blades, Delaware

Ten Bears Environmental
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Milton, Delaware 19968
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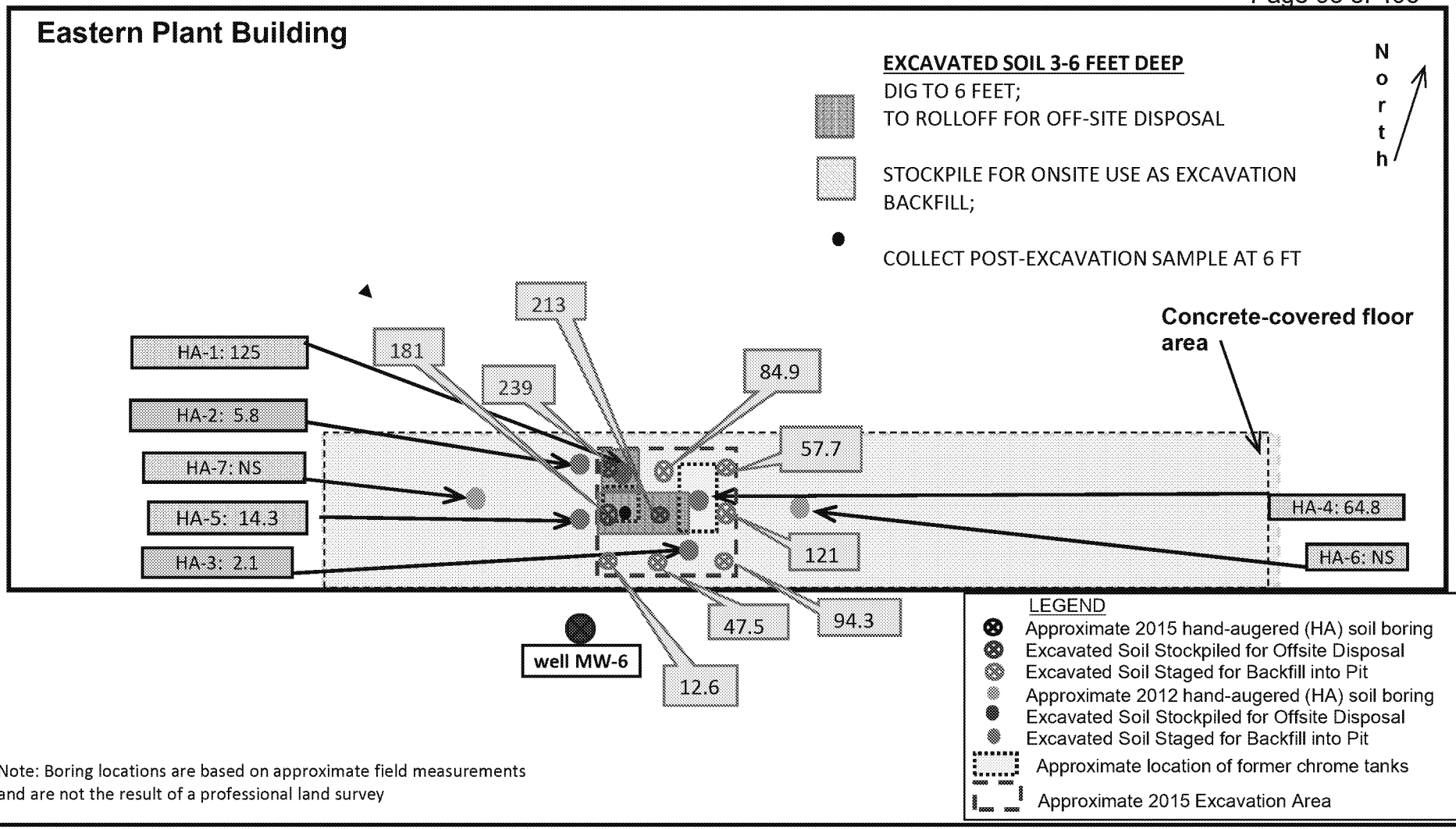
DATE:	8/06/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	EWR	SCALE:	1" = approx. 20'
CHECKED BY:	RCG	FIGURE NO:	27
FILE NO:	111027.FIG	SHEET 1 OF 1	

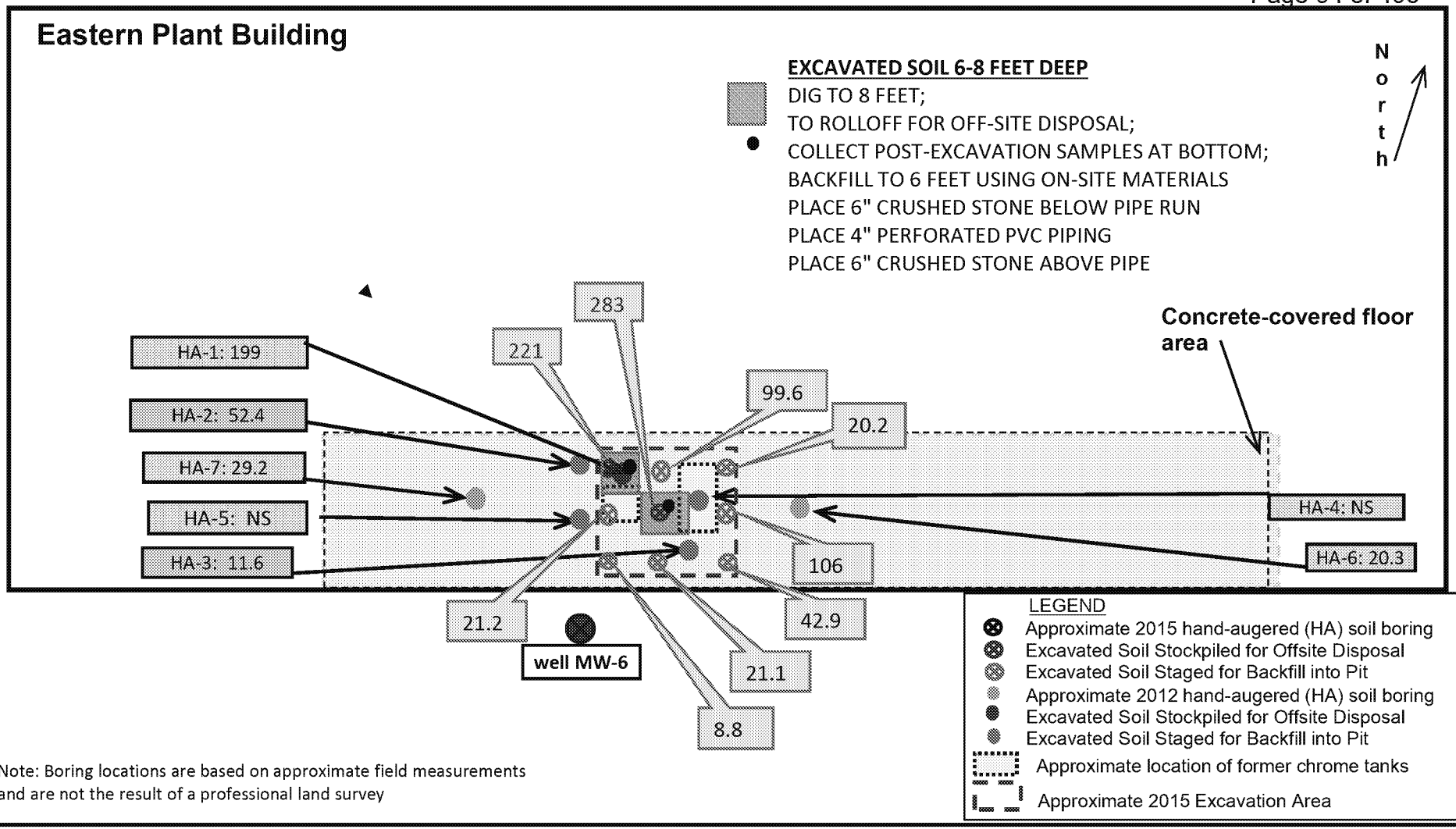


Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

FIGURE 28 - TOTAL CHROMIUM IN 2015 SAMPLES (mg/kg) (3-6 FT DEPTH)
with 2012 SAMPLES (3-5 FT) CHROMIUM RESULTS (mg/kg)
Procino Plating Facility
910 South Market Street, Blades, Delaware

Ten Bears Environmental
606 Federal Street
Milton, Delaware 19968
Phone: (302) 684-5080 Fax: (302) 684-5081

DATE:	8/06/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	EWR	SCALE:	1" = approx. 20'
CHECKED BY:	RCG	FIGURE NO:	28
FILE NO:	111027.FIG	SHEET 1 OF 1	



Note: Boring locations are based on approximate field measurements and are not the result of a professional land survey

FIGURE 29 - TOTAL CHROMIUM IN 2015 SAMPLES (mg/kg) (6-8 FT DEPTH)
with 2012 SAMPLES (6.5 -8.5 FT) CHROMIUM RESULTS (mg/kg)
Procino Plating Facility
910 South Market Street, Blades, Delaware

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Milton, Delaware 19968
Phone: (302) 684-5080 Fax: (302) 684-5081

DATE:	8/06/2015	JOB NUMBER:	11-1027.A
DRAWN BY:	EWR	SCALE:	1" = approx. 20'
CHECKED BY:	RCG	FIGURE NO:	29
FILE NO:	111027.FIG	SHEET 1 OF 1	

Ex. 9 Wells & Ex. 6 Personal Privacy

Ten Bears Environmental

Ten Bears Environmental
1080 S. Chapel Street
Newark, Delaware 19702
Phone: (302) 731-8633 Fax: (302) 731-8655

FIGURE 30 - LINES OF CROSS-SECTION
(from Sussex County, Delaware Tax Parcel Map)
PROCINO PLATING PROPERTY
BLADES, SUSSEX COUNTY, DELAWARE

DATE:	9/10/2015	JOB NUMBER:	12-1027.C
DRAWN BY:	BKG	SCALE:	as noted
CHECKED BY:	EWR	FIGURE NO:	21
FILE NO:	12-1027.CFIG5	SHEET 1 OF 1	

FIGURE 31 - NORTH TO SOUTH CROSS SECTION
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE

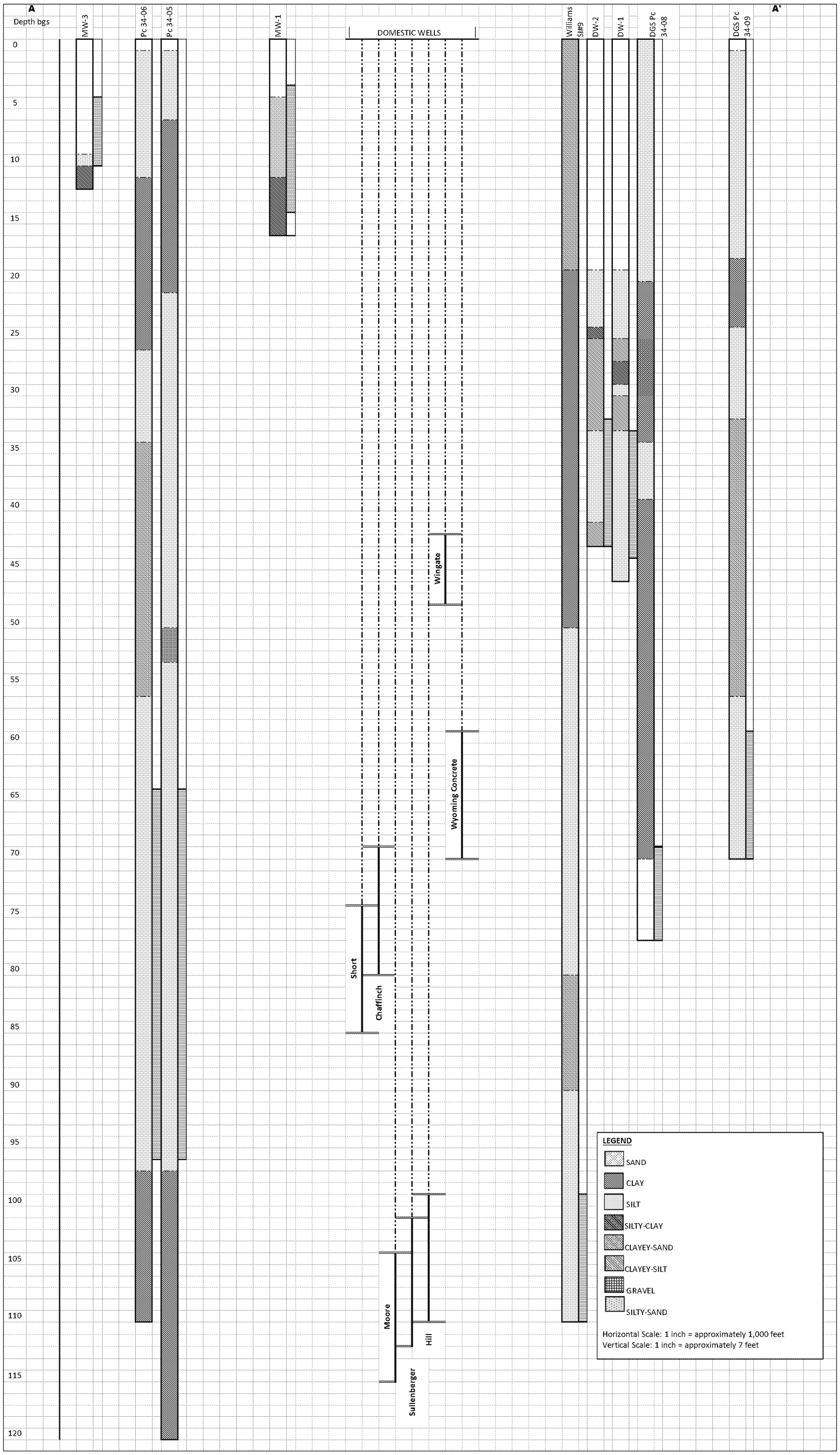
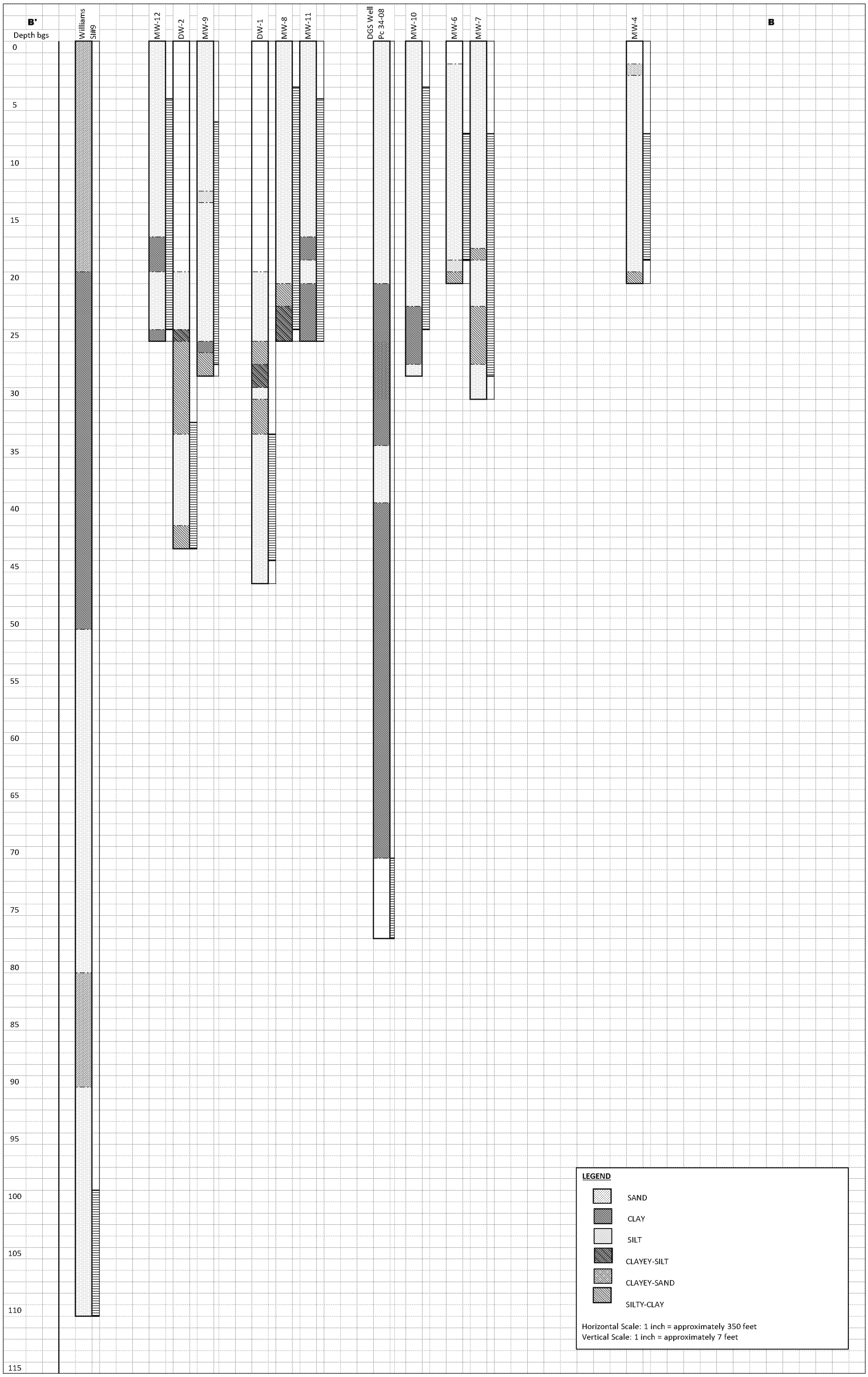


FIGURE 32 - NE TO SW CROSS SECTION
PROCINO PLATING PROPERTY
901 SOUTH MARKET STREET
TOWN OF BLADES, DELAWARE



TABLES

TABLE 1
LOCAL EXISTING WELL INFORMATION
PROCINO PLATING SITE
BLADES, SUSSEX COUNTY, DELAWARE

DGS WELL IDENTIFIER	DNREC WELL PERMIT NUMBER	DNREC SITE INSPECTION WELL *	OWNER NAME	CLAY INTERVAL (ft BGS)	SCREENED INTERVAL (ft BGS)	TOTAL DEPTH (ft BGS)	NOTES
Pc 34-01	NA		Ex. 6 Personal Privacy (PP)	6-13; 19-29, 78-79	NA	84	Abandoned
Pc 34-03	NA			4 - 18	30 - 35	35	
Pc 34-04	NA		Town of Blades	10 - 26	NA	120	test well
Pc 34-05	NA		Town of Blades	6 - 21; 97 - 120	65 - 95	120	Town Supply Well PW#1
Pc 34-06	NA		Town of Blades	11-26; 34-56; 97-110	66 - 96	110	Town Supply Well PW#2
Pc 34-07	NA		Town of Blades	11-26; 34 -56; 97 -110	NA	110	
Pc 34-08	NA		Ex. 6 Personal Privacy (PP)	18 - 36; 41 - 70	70 - 77	77	On Town water; old well not in use.
Pc 34-09	NA			18 - 24	60 - 70	70	
NA	235937	18		no log available	75 - 85	150	
NA	237782	9		30-50	100 - 110	150	new well 12/2011; replaced DNREC SI Domestic Well #9.
NA	183204	not sampled		no log available	70 - 80	82	
NA	156332	15		no log available	105 - 115	115	
NA	174730	20		no log available	102 - 112	112	
NA	37875			no log available	NA	74	no other data
NA	175398		Delmar Feeds	no log available	NA	60	no other data
NA	227130	14	Ex. 6 Personal Privacy (PP)	no log available	100 - 110	120	
NA	215476	8		no log available	43 - 48	50	resampled by TBE for this RI
NA	185296			no log available	NA	115	
NA	81081		Wyoming Concrete	no log available	60 - 70	70	Industrial

DGS = Delaware Geological Survey, University of Delaware, Newark Delaware - source of data for wells having DGS identifier

DNREC = Department of Natural Resources & Environmental Control, Division of Water Resources - Water Supply Branch - source of well permit information

* DNREC Site Inspection (Septermber 2011), Table 10.

BGS = below ground surface

NA = data Not Available in records reviewed

TABLE 2
MONITORING WELL CONSTRUCTION AND ELEVATION SUMMARY
REMEDIAL INVESTIGATION
PROCINO PLATING PROPERTY
BLADES, DELAWARE

WELL ID	DNREC WSS PERMIT	DATE of INSTALL	TOTAL DEPTH (ft bgs)	SCREENED INTERVAL (feet bgs)	DEPTH to CLAY (feet bgs)	RELATIVE TOP OF CASING ELEVATION*	April 19, 2012		May 2, 2012		May 9, 2012		May 9, 2013		May 29, 2014		May 14, 2015	
							DEPTH TO WATER**	RELATIVE ELEVATION	DEPTH TO WATER**	RELATIVE ELEVATION	DEPTH TO WATER**	RELATIVE ELEVATION	DEPTH TO WATER**	RELATIVE ELEVATION	DEPTH TO WATER**	RELATIVE ELEVATION	DEPTH TO WATER**	RELATIVE ELEVATION
MW-1	235312	5/24/2011	20	8-18	no clay	27.66	8.80	18.86	NM		8.71	18.95	7.23	20.43	7.40	20.26	NM	
MW-2	235308	5/24/2011	20	8-18	no clay	27.37	8.50	18.87	NM		8.39	18.98	6.88	20.49	7.05	20.32	NM	
MW-3	235307	5/24/2011	20	8-18	no clay	28.76	9.76	19.00	NM		9.63	19.13	8.06	20.70	8.29	20.47	NM	
MW-4	235309	5/25/2011	20	8-18	20.0	30.89	11.80	19.09	NM		11.72	19.17	10.18	20.71	10.36	20.53	NM	
MW-5	235310	5/25/2011	20	9-19	no clay	30.415	11.43	18.99	NM		11.38	19.04	9.93	20.49	10.03	20.39	NM	
MW-6	235311	5/25/2011	20	8-18	19.7	29.61	10.67	18.94	NM		10.59	19.02	9.11	20.50	7.27	22.34	9.31	20.30
MW-7	238779	4/26/2012	27.5	7.5 - 27.5	27.0	29.525	Wells Not Installed		10.37	19.16	10.50	19.03	9.02	20.51	9.18	20.35	9.19	20.34
MW-8	238780	4/26/2012	24.0	4-24	23.5	26.685			7.71	18.98	7.86	18.83	6.45	20.24	6.56	20.13	6.58	20.11
MW-9	238781	4/26/2012	27.0	7-27	26.5	26.25			7.32	18.93	7.48	18.77	6.60	19.65	6.13	20.12	NM	
Site Well	NA	NA	33.0***	NA	NA	28.655	NM		9.5	19.16	9.01	19.65	NM		NM		NM	
MW-10	243228	5/7/2013	24	4-24	22.5	28.35	Wells Not Installed		Wells Not Installed		Wells Not Installed		7.98	20.37	8.07	20.28	8.11	20.24
MW-11	243226	5/7/2013	25	5-25	25.0	28.38							8.27	20.11	8.35	20.03	8.37	20.01
MW-12	243227	5/7/2013	24	4-24	23.7	28.17							8.18	19.99	8.24	19.93	NM	
DMW-1	242332	5/6 -8/2013	44	34-44	29.9	26.79							9.25	17.54	9.07	17.72	NM	
DMW-2	242333	5/6 -8/2013	43	33-43	25.0	26.50							9.03	17.47	8.83	17.67	NM	
MW-13	249873	4/30/2015	16	6-16	no clay	29.46	Wells Not Installed		Wells Not Installed		Wells Not Installed		Wells Not Installed		Wells Not Installed		9.19	20.27
MW-14	249872	4/30/2015	15	5-15	no clay	28.61											8.98	19.63
MW-15	249871	4/30/2015	16	6-16	no clay	30.10											10.27	19.83
DMW-3	249870	4/30/2015	34	24-34	27.5	29.73											12.41	17.32

TABLE NOTES

MW-1 through MW-6 installed for DNREC Site Inspection, May 2011; for more information refer to SI Report (DNREC, September 2011).

* Top of PVC Casing surveyed by TBE relative to an assumed site datum; not the work of a professional land surveyor.

** Depth to groundwater measured from the top of the PVC casing (TOC).

*** Based upon field measurement only; well installed in concrete vault with floor approximately 3 feet bgs.

NA = Not Available in data researched

NM = Not Measured

This table is part of Ten Bears Environmental's September 2015 report entitled, "RI Report, Procino Plating Facility" and should be viewed only in that context.

TABLE 3
TOTAL CHROMIUM IN SOIL SAMPLES (mg/kg)
PHASE I REMEDIAL INVESTIGATION (MAY 2012)
PROCINO PLATING SITE
BLADES, DELAWARE

Analysis Name	Total Chromium	Chromium III	Chromium IV
Units	mg/kg	mg/kg	mg/kg
Method	SW-846 6010B		
HA-1 (3-5')	126.00		
HA-1 (6.5-8.5')	199.0		
HA-2 (3-5')	5.84		
HA-2 (6.5-8.5')	52.4		
HA-3 (3-5')	2.12		
HA-3 (6.5-8.5')	11.6		
HA-4 (0-2')	37.8		
HA-4 (3-5')	64.8		
HA-5 (0-2')	11.3		
HA-5 (3-5')	14.3		
HA-6 (0-2')	105.0		
HA-6 (6.5-8.5')	20.3		
HA-7 (0-2')	27.1		
HA-7 (6.5-8.5')	29.2		
REGULATORY LEVELS			
DNREC-SIRS SCREENING LEVEL	**214**	12,000	0.29
DNREC-SIRS REPORTING LEVEL	**214**	5,000	2.9
TYPICAL DELAWARE SOIL CONCENTRATION	5-30	NA	NA
EPA REGIONAL SCREENING LEVEL (RSL) INDUSTRIAL SOIL	NA	1,500,000	5.6
EPA REGIONAL SCREENING LEVEL (RSL) RESIDENTIAL SOIL	NA	120,000	0.029

Note: NA= Not Available

TABLE 4

2012 SYNTHETIC PRECIPITATION LEACHING PROCEDURE SAMPLE RESULTS (mg/L)

PROCINO PLATING SITE

BLADES, DELAWARE

Analysis Name	Units	Method	HA-1 (3'-5')			HA-1 (6.5-8.5)			HA-2 (6.5-8.5')		
			Result	MDL**	LOQ	**Result**	MDL**	LOQ	**Result**	MDL**	LOQ
Total Chromium	mg/L	SW-846 6010B	**0.132**	0.0011	0.0150	**0.245**	0.0011	0.0150	**0.138**	0.0011	0.0150
WW/TL SW 846 ICP Digest (tot)		SW-846 3010A									
Synthetic Precipitation Leach		SW-846 1312									

SOIL SAMPLES USED FOR SPLP ANALYSES (from Table 3)

Analysis Name	Units	Method	HA-1 (3-5')	HA-1 (6.5-8.5')	HA-2 (3-5')	HA-2 (6.5-8.5')	HA-3 (3-5')	HA-3 (6.5-8.5')	HA-4 (0-2')	HA-4 (3-5')	HA-5 (0-2')	HA-5 (3-5')	Dry MDL
Total Chromium	mg/kg	SW-846 6010B	126	199	5.84	52.4	2.12	11.6	37.8	64.8	11.3	14.3	0.140

TABLE 5

CHROMIUM and CYANIDE CONCENTRATIONS in GROUNDWATER SAMPLES 2011-2015

REMEDIAL INVESTIGATION

PROCINO PLATING PROPERTY

BLADES, DELAWARE

MONITOR WELL ID	Total Cyanide MCL (mg/L)	Total Chromium MCL (mg/L)	May 2011 (DNREC SIRS)			May 2012					May 2013			May 2014			May 2015
			Total CN mg/L	Total Cr mg/L	Dissolved Cr mg/L	Total CN mg/L	Total Cr (mg/L) shallow	Total Cr (mg/L) deep	Dissolved Cr (mg/L) shallow	Dissolved Cr (mg/L) deep	Total CN mg/L	Total Cr (mg/L) shallow	Total Cr (mg/L) deep	Total CN mg/L	Total Cr (mg/L) shallow	Total Cr (mg/L) deep	Dissolved Cr mg/L
MW-1	0.2	0.1	**ND**	**ND**	**ND**	NS	NS				NS			ND (<0.005)	ND (<0.0016)		NS
MW-2	0.2	0.1	**ND**	**ND**	**ND**									ND (<0.005)	ND (<0.0016)		
MW-3	0.2	0.1	**ND**	**ND**	**ND**									ND (<0.005)	ND (<0.0016)		
MW-4	0.2	0.1	**ND**	**ND**	**ND**									ND (<0.005)	ND (<0.0016)		
MW-5	0.2	0.1	**ND**	**ND**	**ND**									ND (<0.005)	ND (<0.0016)		
MW-6	0.2	0.1	**ND**	**1.030**	**0.959**	NS	1.170	1.170	1.140	1.160	NS	0.319	0.257	ND (<0.005)	0.222		0.115
8140 1st St	0.2	0.1	**0.020**	**0.0242**	**NS**	<0.05 *	0.0155 *		NS		0.0088 J	0.0115 J		ND (<0.005)	0.0103 J		NS
MW-7	0.2	0.1	wells not installed			ND	0.0785	0.065	0.0815.	0.058	NS	0.0607	0.0820	ND (<0.005)	0.129		0.0274 / 0.0279
MW-8	0.2	0.1				ND	0.0207	0.0248	0.0205	0.024	NS	ND	ND	ND (<0.005)	ND (<0.0016)		ND (<0.0013)
MW-9	0.2	0.1				ND	ND	ND	ND	ND	NS	ND	ND	ND (<0.005)	ND (<0.0016)		NS
Onsite Well	0.2	0.1	NS			ND	0.006	0.007	ND	ND	NS			NS			NS
MW-10	0.2	0.1	wells not installed			wells not installed					NS	0.193	0.148	ND (<0.005)	0.136	0.139	0.085 / 0.083
MW-11	0.2	0.1									NS	0.0063 J	0.0052 J	ND (<0.005)	0.0061 J		0.0044 J
MW-12	0.2	0.1									NS	ND	ND	ND (<0.005)	ND (<0.0016)		NS
DMW-1	0.2	0.1									NS	0.0011 J		ND (<0.005)	ND (<0.0016)		NS
DMW-2	0.2	0.1									NS	0.0041 J		ND (<0.005)	ND (<0.0016)		NS
MW-13	0.2	0.1	wells not installed			wells not installed					wells not installed			wells not installed			0.0017
MW-14	0.2	0.1															ND (>0.0013)
MW-15	0.2	0.1															0.0129 J
DMW-3	0.2	0.1															ND (<0.0013)

Table Notes:

BOLD indicates data reported in DNREC's Site Inspection (May 2011, SI Report September 2011).

NS = Not Sampled on that date

ND = Not Detected at a concentration above the lab limit of detection; unless specified, use 0.0011 mg/L for chromium and 0.0050 mg/L for cyanide; refer to Lab Data Packages.

* Residence sampled in May 2012 by DNREC Office of Drinking Water concurrently with Ten Bears' groundwater sampling investigation.

This table is part of Ten Bears Environmental's 2015 report entitled, "Remedial Investigation Report, Procino Plating Facility" and should be viewed only in that context.

TABLE 6
TOTAL and DISSOLVED METALS IN GROUNDWATER SAMPLES (mg/L)
PHASE I REMEDIAL INVESTIGATION (MAY 2012)
Procino Plating Facility
Blades, Delaware

TOTAL METALS	Units	EPA MCL	EPA RSL	DNREC SL	MW-6		MW-7		MW-8		MW-9		DEEP WELL		LAB MDL
					11.5 ft	17 ft	12.5 ft	27.0 ft	9.5 ft	23.0 ft	9.95 ft	25.5 ft	12.0 ft	35.0 ft	
Aluminum	mg/l	0.05-0.2*	16	1.6	n.a.	n.a.	n.a.	0.163 J*	n.a.	N.D.	n.a.	0.135 J*	n.a.	N.D.	0.0801*
Antimony	mg/l	0.006	0.0006	0.0006	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0058
Arsenic	mg/l	0.01	0.000045	0.000045	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	0.0096 J	n.a.	N.D.	0.0051
Barium	mg/l	2	2.9	0.29	n.a.	n.a.	n.a.	0.0192	n.a.	0.0495	n.a.	0.0712	n.a.	0.162	0.00026
Beryllium	mg/l	0.004	0.16	0.0016	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.00024
Cadmium	mg/l	0.005	0.0069	0.00069	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.00027
Calcium	mg/l				n.a.	n.a.	n.a.	10.7	n.a.	20.5	n.a.	24.3	n.a.	26.9	0.0705
Chromium	mg/l	0.1		0.01	1.17	1.17	0.0785	0.0650	0.0207	0.0248	N.D.	N.D.	0.0059 J	0.0074 J	0.0011
Cobalt	mg/l		0.0047	0.00047	n.a.	n.a.	n.a.	0.00083 J	n.a.	0.00070 J	n.a.	0.00079 J	n.a.	0.0118	0.00062
Copper	mg/l	1.3	0.62	0.062	n.a.	n.a.	n.a.	0.0273	n.a.	0.0054 J	n.a.	0.0052 J	n.a.	0.0570	0.00094
Iron	mg/l	0.3*	11	1.1	n.a.	n.a.	n.a.	0.116 J	n.a.	0.0237 J	n.a.	0.0794 J	n.a.	17.4	0.0141
Lead	mg/l	0.015			n.a.	n.a.	n.a.	0.0022 J	n.a.	0.0026 J	n.a.	N.D.	n.a.	0.0447	0.0022
Magnesium	mg/l				n.a.	n.a.	n.a.	1.65	n.a.	2.60	n.a.	3.27	n.a.	3.01	0.0067
Manganese	mg/l	0.05*	0.32	0.032	n.a.	n.a.	n.a.	0.0092	n.a.	0.0067	n.a.	0.0057	n.a.	0.176	0.00044
Nickel	mg/l				n.a.	n.a.	n.a.	0.144	n.a.	0.0043 J	n.a.	0.0309	n.a.	0.0090 J	0.00095
Potassium	mg/l				n.a.	n.a.	n.a.	3.45	n.a.	2.48	n.a.	9.38	n.a.	4.90	0.0874
Selenium	mg/l	0.05	0.078	0.0078	n.a.	n.a.	n.a.	N.D.	n.a.	0.0114 J	n.a.	0.0157 J	n.a.	0.0173 J	0.0069
Silver	mg/l	0.1*	0.071	0.0071	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	0.0014 J	0.00091
Sodium	mg/l				n.a.	n.a.	n.a.	9.32	n.a.	14.6	n.a.	11.5	n.a.	26.7	0.0647
Thallium	mg/l	0.002			n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	0.0052 J	0.0042
Vanadium	mg/l		0.078	0.0078	n.a.	n.a.	n.a.	0.0014 J	n.a.	0.0014 J	n.a.	0.0031 J	n.a.	0.0013 J	0.00096
Zinc	mg/l	5*	47	0.47	n.a.	n.a.	n.a.	0.0887	n.a.	0.0108 J	n.a.	0.0245	n.a.	0.300	0.0032
Mercury	mg/l	0.002	0.0013	0.000063	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	0.00037	0.000026
Total Cyanide	mg/l	0.2	0.0093	0.00093	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0050

NOTES:
MDL = laboratory Method Detection Limit
n.a. = not analyzed
N.D. = Not Detected above the lab Method Detection Limit
J = estimated concentration above the MDL but below the lab limit of Quantitation
MCL = Maximum Contaminant Level, Primary Drinking Water Standards
DNREC SL = State of Delaware Department of Natural Resources and Environmental Control, Screening Levels (Jan 2013)
* Secondary MCL

TABLE 6
TOTAL and DISSOLVED METALS IN GROUNDWATER SAMPLES (mg/L)
PHASE I REMEDIAL INVESTIGATION (MAY 2012)
Procino Plating Facility
Blades, Delaware

DISSOLVED	Units	EPA MCL	EPA RSL	DNREC SL	MW-6 Filtered		MW-7 Filtered		MW-8 Filtered		MW-9 Filtered		DEEP WELL Filtered		MDL
METALS					11.5 ft	17.0 ft	12.5 ft	27.0 ft	9.5 ft	23.0 ft	9.5 ft	25.5 ft	12.0 ft	35.0 ft	
Aluminum	mg/l	0.05-0.2*	16	1.6	n.a.	n.a.	n.a.	0.103 J*	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0801*
Antimony	mg/l	0.006	0.0006	0.0006	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0058
Arsenic	mg/l	0.01	0.000045	0.000045	n.a.	n.a.	n.a.	N.D.	n.a.	0.0059 J	n.a.	N.D.	n.a.	N.D.	0.0051
Barium	mg/l	2	2.9	0.29	n.a.	n.a.	n.a.	0.0180	n.a.	0.0485	n.a.	0.0714	n.a.	0.158	0.00026
Beryllium	mg/l	0.004	0.16	0.0016	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.00024
Cadmium	mg/l	0.005	0.0069	0.00069	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.00027
Calcium	mg/l				n.a.	n.a.	n.a.	10.2	n.a.	20.1	n.a.	24.2	n.a.	26.0	0.0705
Chromium	mg/l	0.1		0.01	1.14	1.16	0.0815	0.0576	0.0205	0.0237	N.D.	N.D.	N.D.	N.D.	0.0011
Cobalt	mg/l		0.0047	0.00047	n.a.	n.a.	n.a.	0.0012 J	n.a.	0.00074 J	n.a.	0.00083 J	n.a.	0.0089	0.00062
Copper	mg/l	1.3	0.62	0.062	n.a.	n.a.	n.a.	0.0239	n.a.	0.0051 J	n.a.	0.0053 J	n.a.	0.0081 J	0.00094
Iron	mg/l	0.3*	11	1.1	n.a.	n.a.	n.a.	0.0210 J	n.a.	N.D.	n.a.	N.D.	n.a.	1.95	0.0141
Lead	mg/l	0.015			n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0022
Magnesium	mg/l				n.a.	n.a.	n.a.	1.60	n.a.	2.54	n.a.	3.24	n.a.	2.91	0.0067
Manganese	mg/l	0.05*	0.32	0.032	n.a.	n.a.	n.a.	0.0085	n.a.	0.0065	n.a.	0.0057	n.a.	0.121	0.00044
Nickel	mg/l				n.a.	n.a.	n.a.	0.135	n.a.	0.0033 J	n.a.	0.0298	n.a.	0.0014 J	0.00095
Potassium	mg/l				n.a.	n.a.	n.a.	3.23	n.a.	2.40	n.a.	9.23	n.a.	4.68	0.0874
Selenium	mg/l	0.05	0.078	0.0078	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0069
Silver	mg/l	0.1*	0.071	0.0071	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.00091
Sodium	mg/l				n.a.	n.a.	n.a.	9.03	n.a.	14.4	n.a.	11.6	n.a.	26.3	0.0647
Thallium	mg/l	0.002	0.00016		n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.0042
Vanadium	mg/l		0.078	0.0078	n.a.	n.a.	n.a.	N.D.	n.a.	0.0014 J	n.a.	0.0029 J	n.a.	N.D.	0.00096
Zinc	mg/l	5*	47	0.47	n.a.	n.a.	n.a.	0.0894	n.a.	0.0105 J	n.a.	0.0252	n.a.	0.0337	0.0032
Mercury	mg/l	0.002	0.0013	0.000063	n.a.	n.a.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	n.a.	N.D.	0.000026

NOTES:
MDL = laboratory Method Detection Limit
n.a. = not analyzed
N.D. = Not Detected above the lab Method Detection Limit
J = estimated concentration above the MDL but below the lab limit of Quantitation
MCL = Maximum Contaminant Level, Primary Drinking Water Standards
DNREC SL = State of Delaware Department of Natural Resources and Environmental Control, Screening Levels (Jan 2013)
* Secondary MCL

TABLE 7
CHROMIUM IN 2015 SOIL DELINEATION SAMPLES (mg/kg)
RI REPORT
Procino Plating Property
Blades, Delaware

Depth (ft)	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9
0-3	751/687	580/583	19.7	380	65.7	141	582	143	424
3-6	239	181	12.6	84.9	213	47.5	57.7	121	94.3
6-8	221	21.2	8.74	99.6	283	21.1	20.2	106	42.9

Above DNRECs Screening Level for total chromium in soil (214 mg/kg) - removed
Also included in soil removal

TABLE 8
POST-EXCAVATION SAMPLE RESULTS
INTERIM ACTION SOIL EXCAVATION
Procino Plating Property
Blades, Delaware

Analysis Name	Units	SB-1 Bottom	SB-2 Bottom	SB-4 Bottom	SB-5 Bottom	SB-5 Bottom DUP	SB-7 Bottom	SB-9 Bottom
Chromium	mg/kg	145	183	238	93.1	118	392	23.8
Moisture	%	15.7	14.4	3.3	20.4	n.a.	4.4	4.6
Moisture	%	n.a.	n.a.	n.a.	n.a.	20.4	n.a.	n.a.
Moisture Duplicate	%	n.a.	n.a.	n.a.	n.a.	20.5	n.a.	n.a.

Above DNREC Soil screening Level for total chromium of 214 mg/kg

TABLE 9

CHROMIUM 95% UCL CONCENTRATION in GROUNDWATER SAMPLES 2014-2015

RI REPORT

PROCINO PLATING PROPERTY

BLADES, DELAWARE

MONITOR WELL ID	May 2014 Total Cr mg/L	May 2015 Dissolved Cr mg/L	Used for 95% UCL Chromium mg/L
MW-1	ND (<0.0016)	NS	0.0008
MW-2	ND (<0.0016)		0.0008
MW-3	ND (<0.0016)		0.0008
MW-4	ND (<0.0016)		0.0008
MW-5	ND (<0.0016)		0.0008
MW-6	0.222	0.115	0.115
8140 1st St	0.0103 J	NS	0.0103
MW-7	0.129	0.0274 / 0.0279	0.0279
MW-8	ND (<0.0016)	ND (<0.0013)	0.0007
MW-9	ND (<0.0016)	NS	0.0008
Onsite Well	ND (<0.0011)	NS	0.0006
MW-10	0.136 / 0.139	0.085 / 0.083	0.085
MW-11	0.0061 J	0.0044 J	0.0044
MW-12	ND (<0.0016)	NS	0.0008
DMW-1	ND (<0.0016)	NS	0.0008
DMW-2	ND (<0.0016)	NS	0.0008
MW-13	NS	0.0017	0.0017
MW-14		ND (>0.0013)	0.0007
MW-15		0.0129 J	0.0129
DMW-3		ND (<0.0013)	0.0007
95% UCL			**0.0433**

Table Notes:

NS = Not Sampled on that date

ND = Not Detected at a concentration above the stated lab limit of detection.

This table is part of Ten Bears Environmental's 2015 "RI Report, Procino Plating Facility" and should be viewed only in that context.

APPENDIX A

Peninsula Plating (DE-0287) Site Information

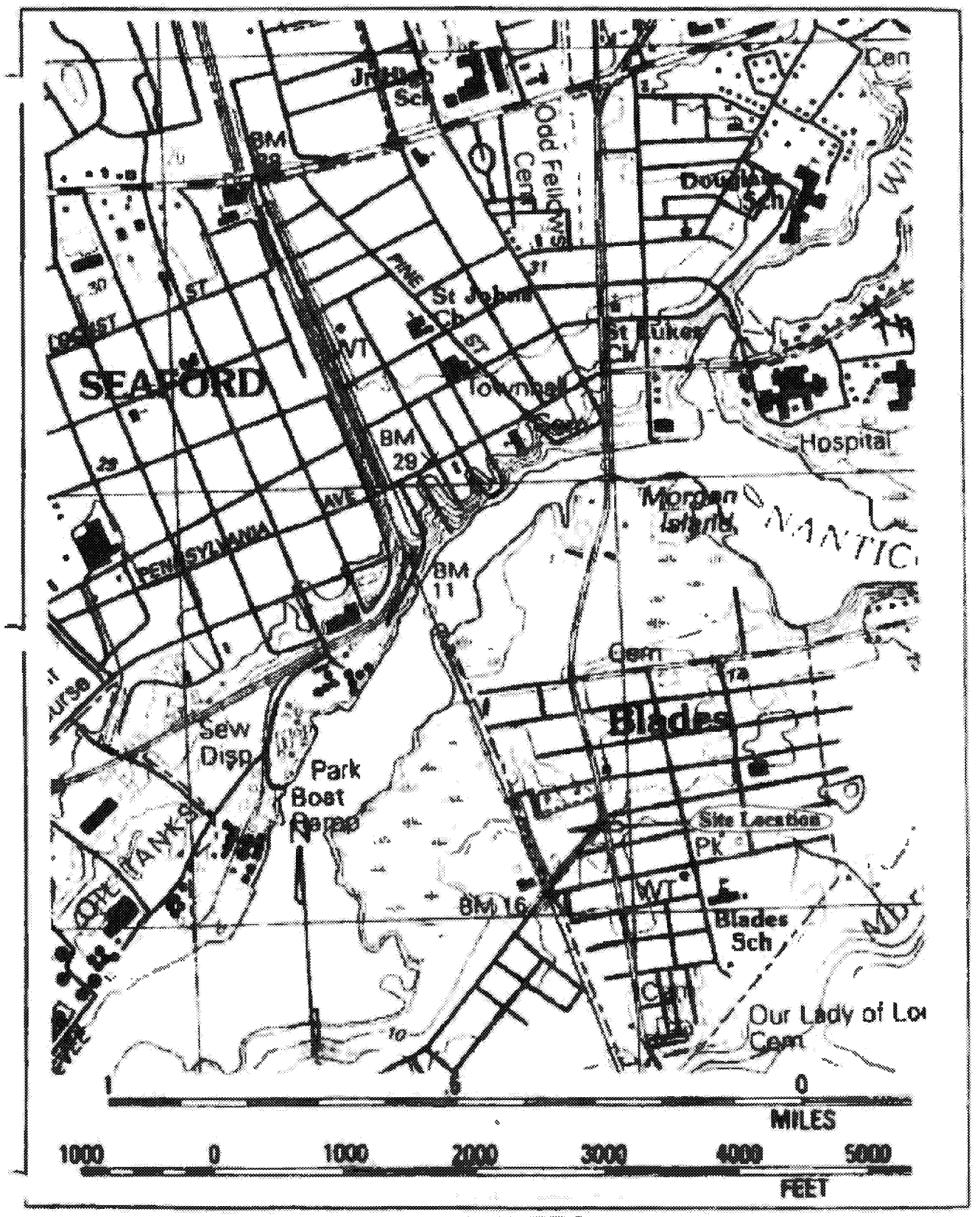


FIGURE 3.

Location of the Peninsula Plating Site.
Market St and River Road Blades Delaware

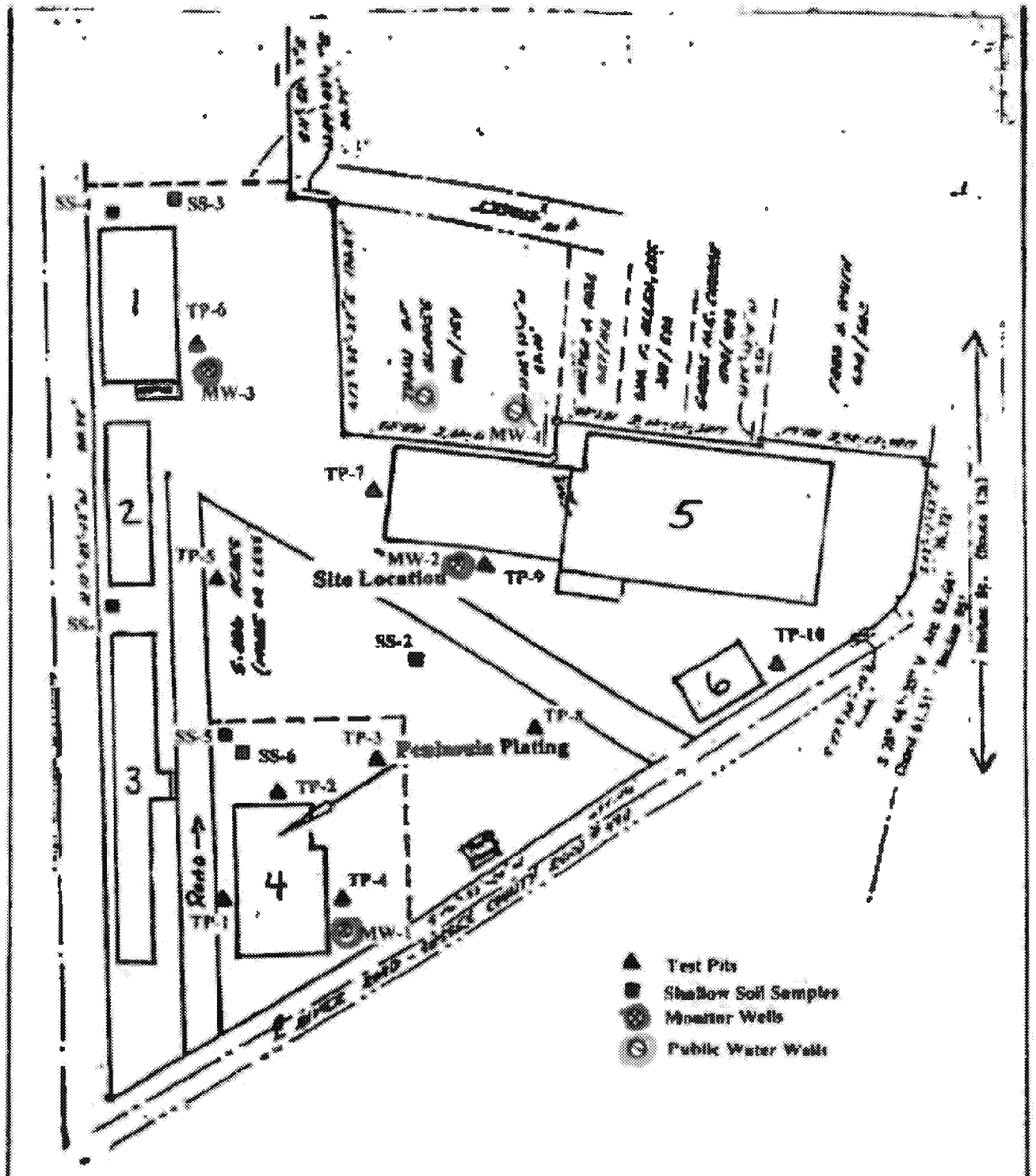


FIGURE 12.

SAMPLE LOCATION MAP OF THE PENINSULA PLATING SITE

No Scale

WALTON CORPORATION
Drilling Contractor
PAPER MILL ROAD -- P.O. BOX 1097
NEWARK, DELAWARE 19715

Phone (302) 737-6480
Fax (302) 737-6309

BORING LOG

CLIENT DNREC
SITE Peninsula Plating
ADDRESS Seaford, DE

PROJECT NO
PERMIT NO.

BORING NO	DRILLER	DATE
MW-1	Ex. 4 CBI	7/20/99
WEATHER	SURFACE ELEVATION	DATUM
Hot and Cloudy		

SAMPLE NO	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	RECOVY	* BLOWS A			
			0.0	4.0	Auger to 4.0 Ft					
1	6.0	8.0	4.0	11.0	(f-c) silty sand		1	2	3	5
2	14.0	16.0	11.0	16.0	Brown silty clay with trace of sand		3	5	3	5

* A number of blows of 140 lb Hammer dropped 30 in required to drive 2 in split-spoon sampler for each of three 6 in increments

REMARKS: W/L @ 5.0 Ft.
Wet on Spoon @ 4.5 Ft.
2" PVC well set @ 14.0 Ft.

GROUNDWATER		
DATE		
TIME		
LEVEL		
BOTTOM		

WALTON CORPORATION
Drilling Contractor
PAPER MILL ROAD - P.O. BOX 1097
NEWARK, DELAWARE 19715

Phone: (302) 737-6480
Fax: (302) 737-6309

BORING LOG

CLIENT: DNREC
SITE: Peninsula Plating
ADDRESS: Seaford, DE

PROJECT NO:
PERMIT NO:

BORING NO	DRILLER	DATE
MW-2	Ex. 4 CBI	7/26/99
WEATHER	SURFACE ELEVATION	DATUM
Cool and Rain		

SAMPLE NO	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	RECOVY	* BLOWS A			
			0.0	6.0	Auger to 6.0 Ft					
1	6.0	7.5			Brown and gray silty (F-c) sand		3	5	7	5
2	9.0	11.0			Brown and gray silty (F-c) sand		3	6	8	9
3	11.0	13.0		13.0	Brown and gray silty (F-c) sand		4	8	7	7

* A number of blows of 140 lb Hammer dropped 30 in required to drive 2 in split-spoon sampler for each of three 6 in increments

REMARKS: Wet on Sppon @ 6.5 ft
2" PVC well @ 13.0 ft.

GROUNDWATER		
DATE		
TIME		
LEVEL		
BOTTOM		

BORING LOG

WALTON CORPORATION

Drilling Contractor
PAPER MILL ROAD P.O. BOX 1097
NEWARK, DELAWARE 19715
Phone (302) 737-6480
Fax (302) 737-6309

CLIENT DNREC
SITE Peninsula Plating
ADDRESS Seaford, DE

PROJECT NO.
PERMIT NO:

BORING NO	DRILLER	DATE
MW-3	Ex. 4 CBI	7/20/99
WEATHER	SURFACE ELEVATION	DATUM
Hot and Humid		

SAMPLE NO	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	RECVY	* BLOWS A			
			0.0	8.0	Auger to 8.0 ft.					
1	8.0	10.0	8.0	10.0			2	4	6	6
2	10.0	12.0	10.0	12.0	Brown and gray sand (F) silty clay		4	8	8	3

* A number of blows of 140 lb Hammer dropped 30 in required to drive 2 in split-spoon sampler for each of three 6 in increments

REMARKS: 2" PVC Well @ 10.0 Ft.

GROUNDWATER		
DATE		
TIME		
LEVEL		
BOTTOM		

TABLE 1
DNREC Site Inspection Soil Screening Analytical Results
Former Peninsula Plating
Blades, Delaware

Sample ID Sample Date Sample Depth (ft)	DNREC URS for Protection of Human Health - Critical Water Resource Area		PPTP-1S 7/20/99 0.5-1	PPTP-2S 7/20/99 0.5-1	PPTP-3S 7/20/99 0.5-1	PPTP-4S 7/20/99 1-1.5	PPTP-5S 7/20/99 1	PPTP-6S 7/20/99 1	PPTP-7S 7/20/99 1-1.5	PPTP-8S 7/20/99 1
Units	Unrestricted Use mg/kg	Restricted Use mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals										
Arsenic	11[t]	11[t]	10.4	4.1	5.0			4.65		
Barium	550	14,000	311.8	232	261	255	285	269	236	295
Calcium	nca	nca	5,623	9,501	8,532	2,160	5,437	6,840	585	2,460
Chromium	35	35	57.2	23.0	15.0			20.2		
Copper	310	8,200	53.0	21.0	20.0	12.8	14.0	12.7	10.3	
Iron	2,300	61,000	**26,600**	**17,344**	**7,755**	**5,580**	**5,018**	**7,400**	1,960	**2,980**
Lead	400	1,000	40.6	46.0	73.0	18.4	13.0	15.2	5.76	12.8
Manganese	160	4,100	134.7	**181**	**343**	76.9	55.0	61.8	37.0	80.5
Mercury	10	10								
Nickel	160	650								27.2
Thallium	14	14			7.0					
Vanadium	55	1,400								
Zinc	2,300	2,300	57.2	52.0	440	16.7	14.0	4.99		30.7
SVOCs	nca	nca	>0.5 - <10	>10	>0.5 - <10	>0.5 - <10	>0.5 - <10	<0.5	<0.5	<0.5
Pests/PCBs	nca	nca	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Qualifiers

Bold - concentration exceeds unrestricted use criteria

Shaded - concentration exceeds restricted use criteria

nca - no criteria available

[t] - Delaware background concentration (DNREC, 2004)

Blank - No results reported

TABLE 1
DNREC Site Inspection Soil Screening Analytical Results
Former Peninsula Plating
Blades, Delaware

Sample ID Sample Date Sample Depth (ft)	DNREC URS for Protection of Human Health - Critical Water Resource Area		PPTP-9S 7/20/99 1	PPTP-10S 7/20/99 1	SS-1 7/20/99 0.17-0.33	SS-2 7/20/99 0.17-0.33	SS-3 7/20/99 0.17-0.33	SS-4 7/20/99 0.17-0.33	SS-5 7/20/99 0.17	SS-6 7/20/99 0.17-0.25	PPTP-1D 7/20/99 5-6
Units	Unrestricted Use mg/kg	Restricted Use mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals											
Arsenic	11[t]	11[t]	13.0		3.62	5.64			6.25		
Barium	550	14,000	332	278	349	459	**553**	369	469	323	243
Calcium	nca	nca	15,100	3,800	22,200	34,400	2,460	7,280	41,000	21,700	503
Chromium	35	35	36.3	12.2	36.8	24.0	35.5	29.8	53	19.3	
Copper	310	8,200	47.7		36.8	43.3	17.4		63.9	17.3	
Iron	2,300	61,000	**16,400**	**5,800**	**20,300**	**14,400**	**10,900**	**10,800**	**21,600**	**8,740**	1,400
Lead	400	1,000	159	20.3	113	69.6	17.5	13.2	72.9	24.0	7.46
Manganese	160	4,100	**442**	**170**	**272**	**192**	100	**178**	**415**	143	35.9
Mercury	10	10									
Nickel	160	650							31.2		
Thallium	14	14									
Vanadium	55	1,400							**70.3**		
Zinc	2,300	2,300	1,200	21.1	1,040	212	22.3	71.1	196	71.3	
SVOCs	nca	nca	>10	>0.5 - <10	>0.5 - <10	>0.5 - <10	<0.5	>0.5 - <10	>0.5 - <10	>0.5 - <10	<0.5
Pests/PCBs	nca	nca	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Qualifiers

Bold - concentration exceeds unrestricted use criteria

Shaded - concentration exceeds restricted use criteria

nca - no criteria available

[t] - Delaware background concentration (DNREC, 2004)

Blank - No results reported

TABLE 1
DNREC Site Inspection Soil Screening Analytical Results
Former Peninsula Plating
Blades, Delaware

Sample ID Sample Date Sample Depth (ft)	DNREC URS for Protection of Human Health - Critical Water Resource Area		PPTP-2D 7/20/99 4-5	PPTP-3D 7/20/99 2-3	PPTP-4D 7/20/99 4-5	PPTP-5D 7/20/99 3-4	PPTP-6D 7/20/99 6-7	PPTP-7D 7/20/99 7-8	PPTP-8D 7/20/99 6-7	PPTP-9D 7/20/99 6-7	PPTP-10D 7/20/99 6-7
Units	Unrestricted Use mg/kg	Restricted Use mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals											
Arsenic	11[1]	11[1]	3.4								
Barium	550	14,000	142	162	133	199	190	217	165	301	260
Calcium	nca	nca	649	7,669	477	487	459	465	398	725	1,320
Chromium	35	35						17.7			15
Copper	310	8,200		9.8			13.3	9.3			3.76
Iron	2,300	61,000	**2,570**	2,098	1,330	1,443	1,700	2,190	1,350	**2,569**	**3,350**
Lead	400	1,000	2.9	5.6		6.4	4.53		6.8		6.63
Manganese	160	4,100	104	31.0		61.0	33.7	48.5	42.7	117	159
Mercury	10	10									
Nickel	160	650									
Thallium	14	14									
Vanadium	55	1,400									
Zinc	2,300	2,300	9.1	119							10.8
SVOCs	nca	nca	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pests/PCBs	nca	nca	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Qualifiers

Bold - concentration exceeds unrestricted use criteria

Shaded - concentration exceeds restricted use criteria

nca - no criteria available

[1] - Delaware background concentration (DNREC, 2004)

Blank - No results reported

000003C

ENVIROFORMS/INORGANIC CLP

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

PPS3-1

Lab Name: DE DNREC:DIV OF WATER RES Contract: DNREC:DAWM

Lab Code: DEDIX Case No.: SAS No.: SDG No.: #07439

Matrix (soil/water): SOIL Lab Sample ID: 99027530

Level (low/med): LOW Date Received: 07/23/99

% Solids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7380			P
7440-36-0	Antimony	0.61	U	N	P
7440-38-2	Arsenic	2.4			P
7440-39-3	Barium	48.3		*	P
7440-41-7	Beryllium	0.22	B		P
7440-43-9	Cadmium	0.39	B		P
7440-70-2	Calcium	6780			P
7440-47-3	Chromium	9.4			P
7440-48-4	Cobalt	2.3	B		P
7440-50-8	Copper	19.4		E	P
7439-89-6	Iron	7080			P
7439-92-1	Lead	72.5			P
7439-95-4	Magnesium	1290		E	P
7439-96-5	Manganese	68.1			P
7439-97-6	Mercury	0.04 ~~0.06~~	B		CV
7440-02-0	Nickel	8.6	B		P
7440-09-7	Potassium	515	B		P
7782-49-2	Selenium	1.2			P
7440-22-4	Silver	0.16	U		P
7440-23-5	Sodium	45.0	U		P
7440-28-0	Thallium	0.32	U		P
7440-62-2	Vanadium	14.3			P
7440-66-6	Zinc	382		N	P
	Cyanide	[illegible]			C

Color Before: BROWN Clarity Before: OPAQUE Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

000005

ENVIROFORMS/INORGANIC CLP

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

PPTP3s

Lab Name: DE DNREC:DIV OF WATER RES Contract: DNREC:DAWM

Lab Code: DE023 Case No.: SAS No.: SDG No.: #07439

Matrix (soil/water): SOIL Lab Sample ID: 99027510

Level (low/med): LOW Date Received: 07/23/99

% Solids: 90.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1610			P
7440-36-0	Antimony	0.60	U	N	P
7440-38-2	Arsenic	1.3	B		P
7440-39-3	Barium	120		*	P
7440-41-7	Beryllium	0.08	B		P
7440-43-9	Cadmium	0.63	B		P
7440-70-2	Calcium	1140			P
7440-47-3	Chromium	2.4			P
7440-48-4	Cobalt	0.96	B		P
7440-50-8	Copper	7.9		E	P
7439-89-6	Iron	2920			P
7439-92-1	Lead	39.0			P
7439-95-4	Magnesium	95.9	B	E	P
7439-96-5	Manganese	86.2			P
7439-97-6	Mercury	0.07	B		CV
7440-02-0	Nickel	3.9	B		P
7440-09-7	Potassium	236	B		P
7782-49-2	Selenium	0.44	U		P
7440-22-4	Silver	0.13	U		P
7440-23-5	Sodium	80.8	B		P
7440-28-0	Thallium	0.39	B		P
7440-62-2	Vanadium	2.9	B		P
7440-66-6	Zinc	243		N	P
	Cyanide	~~0.55~~ 3.3	U		C

mw 8/5/99

Color Before: BROWN Clarity Before: OPAQUE Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

PPTP9a

Lab Name: DE DNREC:DIV OF WATER RES Contract: DNREC:DAWM

Lab Code: DE023 Case No.: SAS No.: SDG No.: #07439

Matrix (soil/water): SOIL Lab Sample ID: 99027530

Level (low/med): LOW Date Received: 07/23/99

% Solids: 90.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2610			P
7440-36-0	Antimony	0.60	U	N	P
7440-38-2	Arsenic	3.1			P
7440-39-3	Barium	139		S	P
7440-41-7	Beryllium	0.17	B		P
7440-43-9	Cadmium	2.2			P
7440-70-2	Calcium	2900			P
7440-47-3	Chromium	5.5			P
7440-48-4	Cobalt	1.9	B		P
7440-50-8	Copper	17.0		E	P
7439-89-6	Iron	6820			P
7439-92-1	Lead	187			P
7439-95-4	Magnesium	351	B	E	P
7439-96-5	Manganese	178			P
7439-97-6	Mercury	0.81			CV
7440-02-0	Nickel	5.0	B		P
7440-09-7	Potassium	428	B		P
7782-49-2	Selenium	0.66	B		P
7440-22-4	Silver	0.16	U		P
7440-23-5	Sodium	44.1	U		P
7440-28-0	Thallium	0.31	U		P
7440-62-2	Vanadium	5.7	B		P
7440-66-6	Zinc	800		N	P
	Cyanide	0.70 ~~2.2~~	~~U~~		C

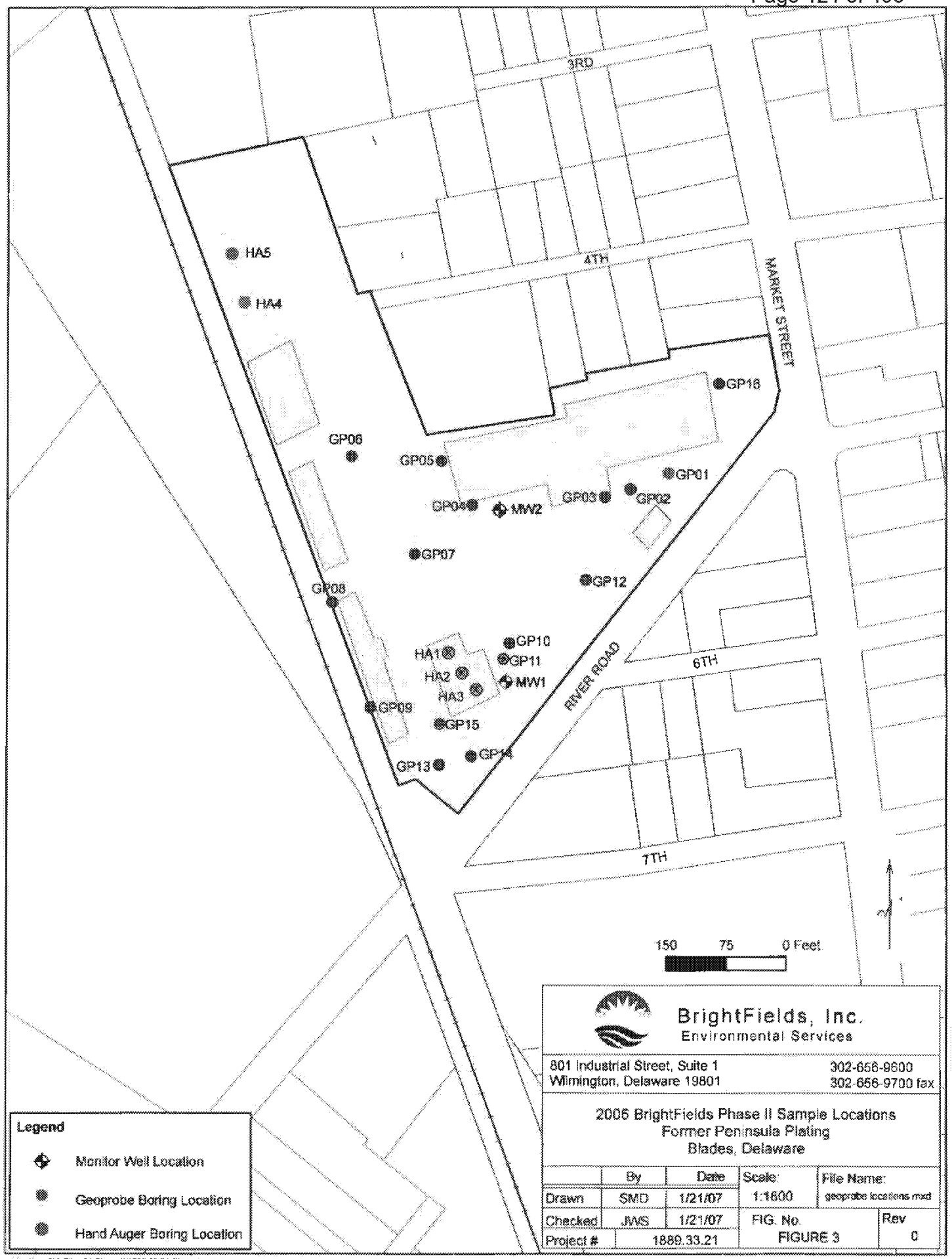
mw 6/5/99

Color Before: BROWN Clarity Before: OPAQUE Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN



BrightFields, Inc.
Environmental Services

801 Industrial Street, Suite 1
Wilmington, Delaware 19801

302-656-9600
302-656-9700 fax

2006 BrightFields Phase II Sample Locations
Former Peninsula Plating
Blades, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	1/21/07	1:1600	geoprobe locations.mxd
Checked	JWS	1/21/07	FIG. No.	Rev
Project #	1889.33.21		FIGURE 3	0

V:\Working GIS Files\21 Phase II\1889.33.21-Blades\mxds\geoprobe locations.mxd

TABLE 5
Public and Private Supply Wells
Former Peninsula Plating
Blades, Delaware

USE	PERMIT#	DEPTH (feet)	CAPACITY (gallons)	SCREEN BOTTOM (feet)	SCREEN TOP (feet)	INNER CASING DIAMETER (Inches)	DATE COMPLETED	APPROXIMATE DISTANCE FROM PROPERTY BOUNDARY (feet)
Public	40024	96	250	96	66	8	1978	25
Public	40025	NA	NA	NA	NA	NA	NA	25
Domestic	37943	57	15	NA	NA	4	1977	140
Agricultural	37959	48	5	NA	NA	1.2	1977	200
Domestic	34542	29	5	NA	NA	1.2	1975	215
Dewatering	47759	22	30	NA	NA	NA	NA	645
Domestic	47756	NA	100	NA	NA	NA	NA	670
Domestic	44566	79	15	79	73	2	1979	795
Domestic	183204	82	10	80	70	2	2002	820
Domestic	156332	115	15	115	105	2	1998	875
Monitor	178482	25	NA	25	15	2	2001	920
Monitor	178480	14	NA	14	4	2	2001	930
Monitor	178481	10	NA	10	5	2	2001	940
Domestic	185206	115	12	NA	NA	NA	NA	940
Domestic	36390	NA	NA	NA	NA	NA	NA	960
Domestic	174730	112	18	112	102	2	2000	985
Domestic	175398	60	12	NA	NA	NA	NA	1035
Domestic	47646	51	5	NA	NA	NA	NA	1170
Domestic	37875	74	25	NA	NA	2	1977	1315
Dewatering	176788	27	50	NA	NA	NA	NA	1455
Misc. Public	38735	80	300	NA	NA	10	1977	1465

NA- NO DATA AVALIBALE

follows:

- Nanticoke deposits
- Beaverdam Formation
- Chesapeake Group
- Competent Bedrock

Based on the drilling log from the wells at the former Peninsula Plating property (MW1, MW2 and MW3 drilled by DNREC in July 1999), the yellow fine to medium sands of the Beaverdam formation ranged in thickness from approximately ground surface to 11 feet bgs. The Beaverdam Formation is underlain by dark gray silty clay to clayey silt of the Manokin Formation.

4.2.2 Site Hydrogeology

According to the logs from boreholes advanced at the Former Peninsula Plating property during the Brownfield Investigation and the Phase II Site Assessment Investigation conducted in November 2006, groundwater was noted in the uppermost layer at depths ranging from 1.5 feet bgs (GP2) to 5.6 feet bgs (GP16). The shallowest groundwater encountered was on the eastern side of the site.

Three wells (MW1 to MW3) were installed as part of the 1999 DNREC Site Investigation, at the locations shown on Figure 2. MW1 was installed in the southern portion of the property near the former plating facility. MW2 was installed in the north central portion of the site near the large warehouse. MW3 was installed in the northwestern portion of the site near the existing 1,000-gallon diesel fuel underground storage tank.

Monitoring well MW1 is screened from 4-14 feet bgs, MW2 is screened from 3-13 feet bgs, and MW3 is screened from 5-10 feet bgs. During the Phase II Site Investigation, MW3 was not located. No evidence of the exact location of MW3 could be obtained from DNREC-SIRB or the DNREC Water Supply Section.

4.2.3.2 Monitoring Well Sampling Observations

Groundwater samples were collected from the two existing monitoring wells (MW1 and MW2 (PPMW-1 and PPMW-2 in Table 4)) at the Former Peninsula Plating Property on December 8, 2006. Wells were purged of three times the volume of water contained prior to collection of samples (see descriptions below). Purge water was monitored for pH, oxidation reduction

APPENDIX B

Background Geologic and Hydrologic Data

B-1 DNREC Division of Water Resources, Water Supply. Well Search Results

B-2 Historical Area Well Logs, Delaware Geological Survey

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER
RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

APPLICATION FOR A PERMIT TO CONSTRUCT A WELL

- OFFICIAL USE ONLY -

PAGE # _____ OF _____ PAGES

PERMIT #: 237782

Owner:	Ex. 6 Personal Privacy (PP)
Address:	
Telephone:	
Email:	
Licensed Preparer / WC:	Willey & Company, Inc
License #:	5416
Date of Application:	12/7/2011
Estimated Construction Date:	12/16/2011
Purpose:	Permanent
Use:	Domestic Standard
Use Other:	
Is this a replacement well?	Yes
Reason:	upgrade
Is public water available?	No
Utility:	
On public sewage?	No
Septic Permit #:	220387

PROPOSED WELL CONSTRUCTION:

Approximate Total Depth: 150.00 feet

Maximum capacity:	20.00 (GPM)
Max. Daily Withdrawal:	300.00 (GPD)

Casing	Top	Bottom	Diameter	Material
Inner Casing	0.00	140.00	2.00	PVC

Screen Material:	PVC		
Top:	140.00	Bottom:	150.00
Type of Grout:	Bentonite		
Top:	0.00	Bottom:	135.00
Gravel Pack Interval:			
Top:	135.00	Bottom:	150.00
Type of Non-Grout Backfill of Well Annulus:			None
Top:	0.00	Bottom:	0.00

Will the operation of this well by itself or in combination with any other well(s), owned or operated be the permittee, withdraw greater than 1,000,000 gallons in any 24hr. period? ☐ Yes ☒ No

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.

Signature - Licensed Preparer/Well Contractor Date

Signature - Property Owner Date

LOCATION MAP - ROAD MAP

County:	Sussex
Tax Parcel:	Ex. 6 Personal Privacy (PP)
Lot #:	
Subdivision:	
ADC Map Grid:	20-J-13
Name of Nearest Town:	Blades
Distance to Nearest Town:	0.50
X:	183093.20
Y:	69924.60

Ex. 9 Wells

Parcel Size:	Less than 0.5 Acre
Proposed Well will be:	
12.00	Feet of the FRONT property line
98.00	Feet of the BACK property line
60.00	Feet of the LEFT property line
60.00	Feet of the RIGHT property line
17.00	Feet from the NEAREST road
55.00	Feet from the SEPTIC TANK and all components
60.00	Feet from the SEPTIC DRAINFIELD/CESSPOOL
0.00	Feet from the CENTRAL SEWER LINE

Ref#: 2507

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

WELL COMPLETION REPORT
MUST BE RETURNED WITHIN
DAYS OF CONNECTION
WELL PERMIT
INCLUDED ATTACH

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit # 130225 Local ID:

Tax Map/Parcel #:

Property Owner:

Ex. 6 Personal Privacy (PP)

Water Well Contractor: NBPG LLC WC Lic #: 3416

Well Driller In Charge During Construction:

Ex. 4 CBI

☐ Auger ☐ Bored ☒ Mud Rotary
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☐ Other (Specify)

Total Depth Of Excavation (Feet BGS): 110

Construction Date: 9/12/13

CASING INSTALLATION:

	INNER (1)	OUTER (2)	(3)
Casing Top (Inches AGS):	12		
Casing Bottom (Feet BGS):	100		
Casing Diameter (Inches):	2in		
Casing Material:	PVC		
Gravel Pack Size (#):	#02		

AGS: Above Ground Surface BGS: Below Ground Surface

SCREEN INSTALLATION

Screen Top (Feet BGS):
Screen Bottom (Feet BGS):
Screen Diameter (Inches):
Screen Material:
Screen Slot Size (1000th of an Inch):

WELL USE:

☒ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☐ Other (Specify):

Pump Manufacturer: Horsepower:

Rated Capacity: (GPM) Pump Intake Setting: (BGS)

Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump

Pump Installed By: ☒ Others: D.C.

Gravel Pack: From: 100 Feet To: 110 Feet

Grout Type: ☒ Bentonite Clay ☐ Cement ☐ Bentonite Clay Plug

Other: From: C Feet To: 100 Feet

Type Of Non-Grout Backfill Of Well Annulus: MA

From: Feet To: Feet

Static Water Level: 18 Feet ☒ Below ☐ Above Ground Surface

Pumping Water Level: 24 Feet On (Date): 9/12/13

After: 1 Hours Pumping Rate: 35 GPM

Pumping Method/Device: ☒ Airlift ☒ Mechanical (Pump) Other:

Was A Geophysical Log Taken? ☐ Yes ☒ No If "Yes", By:

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☒ Other - Specify: CAP

Well Head Completed: 12 Inches ☒ Above ☐ Below Ground Surface

Was The Well Tag Attached In Accordance With Current Regulations?
☒ YES ☐ NO If "NO", Please Explain:

Site Plan: If different from original application, must include complete sketch showing distances from well to house, property lines, nearest road and all nearby septic systems and central sewer lines (industrial, phosphate, etc.) only.

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.

Signature of Well Driller In Charge During Construction

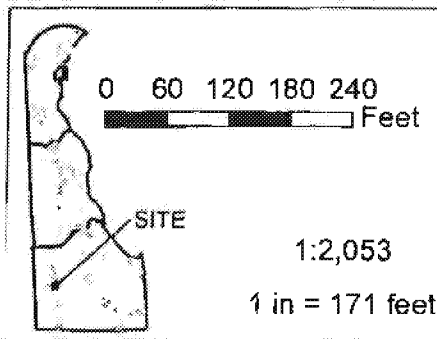
Ex. 4 CBI

Well Driller Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 1013807811 10 GS

Ex. 9 Wells & Ex. 6 Personal Privacy



WHS
Site Investigation &
Restoration Section
[illegible] Drive,
New Castle, DE 19720
302.395.2600

Figure 13
Private Well Sampling Locations
Procino Plating (DE-0344)

This map is provided by the DNREC-SIRB solely for displayand reference purposes and is subject to change withoutnotice. DNREC-SIRB will not be held responsible for the assumed accuracy contained in the map or for use other than it's intended purpose.
September 2011

PermitNumb	LocalWellI	WellType	Owner	TotalDepth	TotalDep_1	DGSid
41168		Agricultural - Standard	Our Lady of Lourde's Cemetary	0.00	40.00	
37959		Agricultural - Standard	Ex. 6 Personal Privacy (PP)	0.00	48.00	
235937	Second Str	Domestic - Standard		150.00	85.00	
237782		Domestic - Standard		150.00	110.00	
183204		Domestic - Standard		0.00	82.00	
156332		Domestic - Standard		0.00	115.00	
174730		Domestic - Standard		0.00	112.00	
37875		Domestic - Standard		0.00	74.00	
175398		Domestic - Standard		0.00	60.00	
227130		Domestic - Standard		120.00	110.00	
215476	1st St.	Domestic - Standard		50.00	48.00	
185296		Domestic - Standard		0.00	115.00	
81081		Industrial - Standard	Wyoming Concrete Industries, Inc	0.00	70.00	
235310		Monitor - Direct Push	DNREC SIRC	25.00	0.00	
235309		Monitor - Direct Push	DNREC SIRC	25.00	0.00	
235307		Monitor - Direct Push	DNREC SIRC	25.00	20.00	
235308		Monitor - Direct Push	DNREC SIRC	25.00	0.00	
235312	PP MW-06	Monitor - Direct Push	DNREC SIRS	25.00	20.00	
235311		Monitor - Direct Push	DNREC SIRC	25.00	0.00	
235312	PP MW-06	Monitor - Direct Push	DNREC SIRS	25.00	20.00	

Reviewable	Existing	ScreenTop	ScreenBase	ScreenMate	MinWellDia	MaxWellDia	X	Y
No	No	35.00	40.00	PVC	2.00	2.00	183383.00000	69814.00000
No	No	0.00	0.00		0.00	0.00	183251.01000	70259.07000
No	No	75.00	85.00	PVC	4.00	4.00	183110.00000	69868.90000
No	No	100.00	110.00	PVC	2.00	2.00	183093.20000	69924.60000
No	No	70.00	80.00	PVC	2.00	2.00	183025.00000	69880.90000
No	No	105.00	115.00	PVC	2.00	2.00	182928.22000	69910.57000
No	No	102.00	112.00	PVC	2.00	2.00	182929.00000	69870.40000
No	No	0.00	0.00		0.00	0.00	183329.60000	70223.71000
No	No	0.00	0.00		0.00	0.00	183077.00000	69812.80000
No	No	100.00	110.00	PVC	4.00	4.00	183022.00000	69958.10000
No	No	43.00	48.00	PVC	2.00	2.00	183130.00000	69892.20000
No	No	0.00	0.00		0.00	0.00	182978.00000	69861.40000
No	No	~~60.00~~	70.~~00 PVC~~		4.00	4.00	183020.76000	70165.08000
No	No	0.00	0.00		0.00	0.00	183149.00000	69982.30000
No	No	0.00	0.00		0.00	0.00	183149.00000	69982.30000
No	No	8.00	18.00	PVC	1.00	1.00	183149.00000	69982.30000
No	No	0.00	0.00		0.00	0.00	183149.00000	69982.30000
No	No	8.00	18.00	PVC	1.00	1.00	183161.00000	69921.10000
No	No	0.00	0.00		0.00	0.00	183149.00000	69982.30000
No	No	8.00	18.00	PVC	1.00	1.00	183161.00000	69921.10000

Latitude	longitude	LocationMe	ModGrid	Watershed	basin	USGSHydrol
38.628789	-75.607498	Map Interpolation-USGS Topographic	092-092	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-092	Nanticoke River	Chesapeake Bay	02060008
		Address Matching-House Number	092-088	Nanticoke River	Chesapeake Bay	02060008
		Address Matching-House Number	092-088	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
		Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
		Address Matching-House Number	092-088	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
		Map Interpolation-USGS Topographic	092-088	Nanticoke River	Chesapeake Bay	02060008
38.631944	-75.611666	Map Interpolation-USGS Topographic	088-084	Nanticoke River	Chesapeake Bay	02060008
38.630300	-75.610184	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.630300	-75.610184	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.630300	-75.610184	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.630300	-75.610184	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.629749	-75.610045	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.630300	-75.610184	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008
38.629749	-75.610045	Address Matching-House Number	092-092	Nanticoke River	Chesapeake Bay	02060008

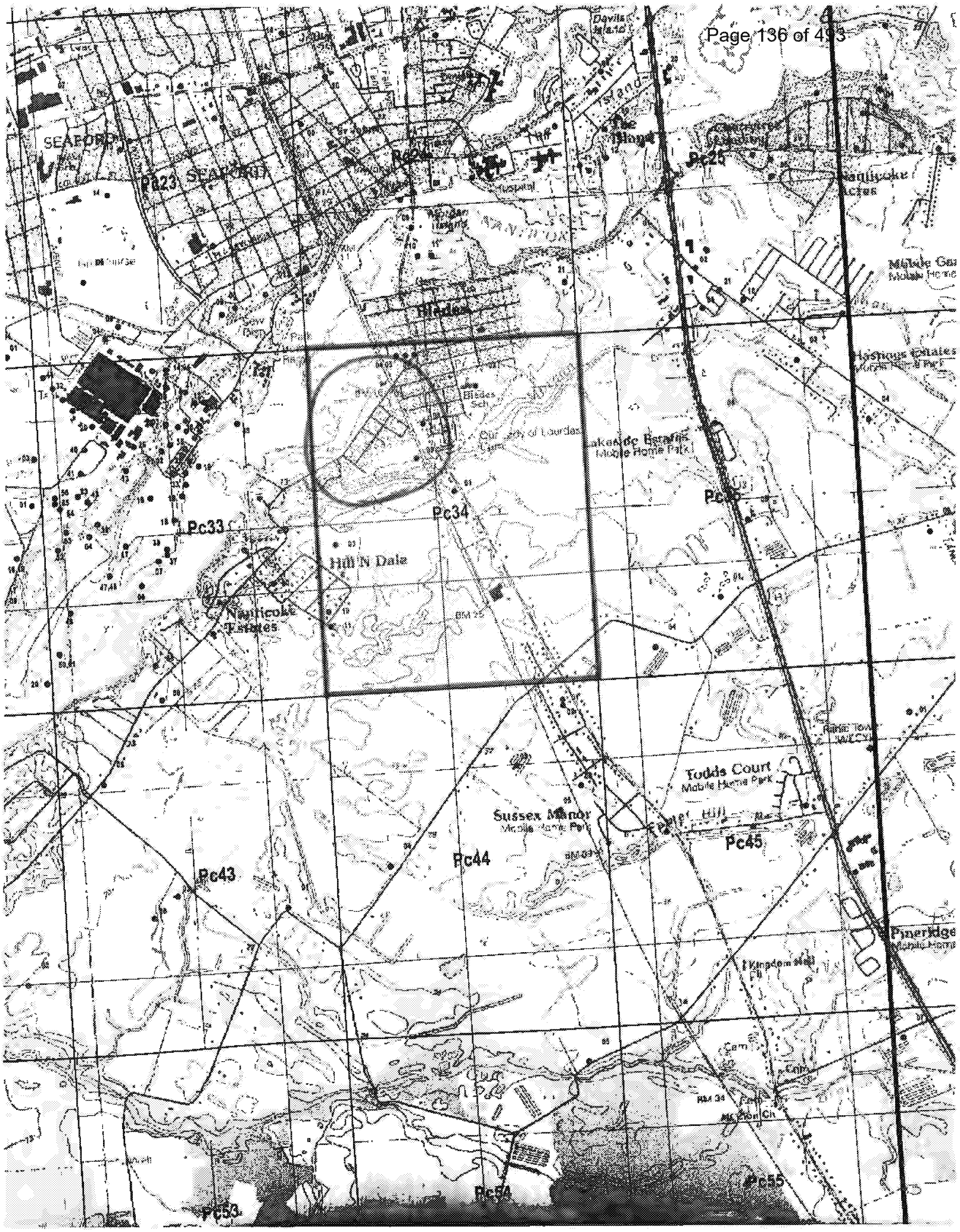
Ex 9 Wells

LicenseNum	WellContra	OwnerAddre	GroutTop	GroutBas
14	A C Schultes Of Delaware	PO Box 719, Seaford, DE 19973 US	0.00	10.00
4058	Walter E Welldriler	Ex. 6 Personal Privacy (PP)	0.00	0.00
4205	Tom's Well Drilling		0.00	50.00
5416	Willey & Company, Inc		0.00	100.00
4205	Tom's Well Drilling		0.00	40.00
1004	Morris Well & Pump Co Inc		0.00	100.00
1004	Morris Well & Pump Co Inc		0.00	90.00
13	Daiseys Well Drillling		3.00	21.00
257	Wooten's Well Drilling		0.00	0.00
5416	Willey & Company, Inc		0.00	95.00
257	Wooten's Well Drilling		0.00	40.00
257	Wooten's Well Drilling		0.00	0.00
14	A C Schultes Of Delaware	140 Southern Boulevard & Redwood Avenue, Wyoming, DE 19934 US	0.00	50.00
		391 Lukens Drive, New Castle, DE 19720 US	0.00	0.00
		391 Lukens Drive, New Castle, DE 19720 US	0.00	0.00
1035	Vironex Inc	391 Lukens Drive, New Castle, DE 19720 US	0.00	6.00
		391 Lukens Drive, New Castle, DE 19720 US	0.00	0.00
1035	Vironex Inc	391 Lukens Drive, New Castle, DE 19720 US	0.00	6.00
		391 Lukens Drive, New Castle, DE 19720 US	0.00	0.00
1035	Vironex Inc	391 Lukens Drive, New Castle, DE 19720 US	0.00	6.00

GroutMater	gravelTop	gravelBase	GravelMate	InnerCasin	InnerCas_1	InnerCas_2
Neat Cement	20.00	40.00	Gravel	0.00	35.00	PVC
	0.00	0.00		0.00	0.00	
Bentonite	75.00	85.00	Gravel	0.00	75.00	PVC
Bentonite	100.00	110.00	Gravel	0.00	100.00	PVC
Bentonite	60.00	80.00	Gravel	0.00	70.00	PVC
Bentonite	103.00	115.00	Gravel	0.00	105.00	PVC
Bentonite	100.00	112.00	Gravel	0.00	102.00	PVC
Cuttings	0.00	0.00		0.00	0.00	
	0.00	0.00		0.00	0.00	
Bentonite	95.00	110.00	Gravel	0.00	100.00	PVC
Bentonite	40.00	48.00	Gravel	0.00	43.00	PVC
	0.00	0.00		0.00	0.00	
Bentonite	50.00	70.00	Gravel	0.00	60.00	PVC
	0.00	0.00		0.00	0.00	
	0.00	0.00		0.00	0.00	
Neat Cement	8.00	18.00	Gravel	0.00	8.00	PVC
	0.00	0.00		0.00	0.00	
Neat Cement	8.00	18.00	Gravel	0.00	8.00	PVC
	0.00	0.00		0.00	0.00	
Neat Cement	8.00	18.00	Gravel	0.00	8.00	PVC

TaxID	SepticPerm	wellauthco	WellStatus	EstMaxCapa	EstDailyUs	Requir	EstConstru	ProposedDr
			Active	10	100	NO	7/8/1978	Mud Rotary
			Pending	5	20000	NO	4/7/1977	Driven
1-32-01.19-0010.01	existing	2941339	Completed	15	300	NO		Mud Rotary
1-32-01.19-0007.00	220387	5645199	Completed	0	300	NO	12/16/2011	Mud Rotary
			Active	10	400	NO	1/5/2002	Mud Rotary
			Active	15	300	NO	2/10/1998	Mud Rotary
			Active	18	300	NO	10/9/2000	Mud Rotary
			Pending	25	400	NO	3/26/1977	Jetted
			Permit Expired	12	400	NO		Unknown
1-32-01.15-0007.00	215724	2484013	Completed	25	300	NO		Mud Rotary
1-32-01.19-0008.00	existing	5335475	Completed	12	350	NO		Mud Rotary
			Permit Expired	12	400	NO		Unknown
			Active	60	36000	NO	12/15/1989	Mud Rotary
1-32-01.15-0187.00	na	6644192	Issued	0	0	NO		Mud Rotary
1-32-01.15-0187.00	na	6644192	Issued	0	0	NO		Mud Rotary
1-32-01.15-0187.00	na	6644192	Completed	0	0	NO		Mud Rotary
1-32-01.15-0187.00	na	6644192	Issued	0	0	NO		Mud Rotary
1-32-01.15-0188.00	n/a	6638133	Completed	0	0	NO		Geo-Probe
1-32-01.15-0187.00	na	6644192	Issued	0	0	NO		Mud Rotary
1-32-01.15-0188.00	n/a	6638133	Completed	0	0	NO		Geo-Probe

Appendix B-2
Historical Area Well Logs,
Delaware Geological Survey,
University of Delaware, Newark DE.


SEAFORD
Pc23
Pc24
Pc25
Pc33
Pc34
Pc35
Pc43
Pc44
Pc45
Pc53
Pc54
Pc55
Hill N Dale
Nanticoke Estates
Lakeside Estates
Mobile Home Park
Todds Court
Mobile Home Park
Sussex Manor
Mobile Home Park
Pineridge
Mobile Home
Hastings Estates
Mobile Home Park
Our Lady of Lourdes Cem
Kingdom Hall
Cem

9-189
(Oct. 1939)

NOTEBOOK SHEET

Name Ex. 4 CBI Date May 27, 1955

Test #9	Pc 34-1 elev. 13'
1) 0-.5	Fill (light)
2) .5-1	Fill (dark)
3) 1-2	sand, medium, brown (dark)
4) 2-3	" " tan
5) 3-4	" " light tan
6) 4-5	" , medium to coarse, reddish-brown with gravel
7) 5-5.2	clay
8) 5.2-6	sand medium to coarse reddish-brown with gravel (water)
9) 6-7	Clay, Red-brown & gray - variegated
10) 7-9	do stiff, with large gravel
11) 9-11	clay, variegated, stiff
12) 11-13	clay, " , " with gravel
13) 13-14	sand & gravel, very clayey

9-189
(Oct. 1939)

NOTEBOOK SHEET

Name Ex. 4 CBI Date 5/20/55

Pc 20	Pc 34-1 (Cont'd)
14'-19'	red, gray brown & some yellowish clay
19'-26'	[illegible] gray clay, some brown sand
26-29'	clay, [illegible]
29-34'	sand [illegible] medium
34-39'	sand [illegible] medium
39-44'	sand [illegible] medium
44-45	clay and gravel No Sample
45-49'	sand [illegible] medium
49-54	sand [illegible] coarse [illegible] red-brown/[illegible]
54-59'	do
59-64'	do
64-69'	sand [illegible] Red-brown
69-74'	No Sample
74-78	sand medium, red brown
78-79'	clay gray [illegible]
79-84'	clayey sand [illegible] brown

Pc 34-1

WELL SCHEDULE

DGS No. Pc 34-3

Recd. No.

Record by Ex. 4 CBI Date 1/27/69

Source of Data WARC

Owner Ex. 6 Personal Privacy (PP) Address

Driller Ex. 4 CBI

Depth Drilled 35 ft. Casing Diam. 2"

Casing Depth

Screen Setting(s) 30-35 Formation

Static Water Lev. 10 ft. on 7/18/68 above below lsd

Pump. Water Lev. 25 ft. on 7/18/68 above below

after 2 hrs. pumping at 30 gpm

Specific Capacity

Elevation of Well

Pump: Type Capacity 12 gpm hp

Well use: Domestic

Quality: pH cl Fe

Hardness other

Other Information:

Descriptive Log x
E-log
Gamma Log

Pump Test
Cores
Ditch Samples
Supplemental Fi.

Remarks:

Pc 34-3

Pc 34-3

RECEIVED
DEC 13
STATE OF DELAWARE
WATER RESOURCES DIVISION

STATE OF DELAWARE
WATER AND AIR RESOURCES COMMISSION
Water Resources Division
Dover, Delaware 19901

WRD-2
11/68

Pc 34-3

WELL COMPLETION REPORT

1. Permit Number: _____
Well Owner: Ex. 6 Personal Privacy (PP)

2. Test Well ____
Observation Well ____
Production Well ✓
Well Abandoned? Yes ___ No ___

3. Well Depth: 35' ft.
Date Completed: 7/15/68

4. Grout: Type Clay
from 0 ft. to 25 ft.
from ____ ft. to ____ ft.

5. Casing: Type Plastic
21" in. to ____ in.
____ in. to ____ in.
Drive Shoe? Yes ___ No ✓

6. Screen: Slot Size 18
30 ft. to 35 ft.

7. Gravel Packed:
25 ft. to 35 ft.

8. Well Head Completion:
____ Pitless Adapter
____ inches above grade

9. Static Water Level:
10' feet below grade

10. Pumping Level:
25 ft. after 2 hrs.
at 30 GPM

11. Capacity of Permanent Pump:
12 GPM

12. Well Number: _____
(leave blank)

13. Well Log

Formation	Thickness of Stratum	Depth to Bottom of Stratum
White Sand	0	4'
Orange Clay	4'	18'
Med Brown Sand	18'	35

14. Signature of Water Well Contractor

Ex. 4 CBI

Date _____

(over)

WELL SCHEDULE

DGS No. Pc34-4

DNREC No. _____

Local No. _____

Record by: Ex. 4 CBI Date Entered 6/26/78

Source of Data Field and Driller

Owner Blades, DE Address _____

Driller Delmarva Date Drilled 6/26/78

Depth Drilled 120 ft. Casing Diam. NA

Casing Depth NA Casing type NA

Screen Setting(s) NA Formation Pleistocene

Static water lev. ____ ft. on ___ 19__ above/below

Pump water lev. ____ ft. on ___ 19__ above/below

after ____ hrs. pumping at ____ gpm

Specific Capacity _____ Elev. of Well _____

Well use: Test well

Quality: pH ____, Cl ____, Fe ____

Hardness _____, other _____

Other information:

Descriptive log x	Pump test
E-log x DSP	Cores
Gamma log S	Ditch samples
Caliper log	Chem. analysis
	Supp. file

Remarks: To be converted to a production well.

Test hole. Produc tion well is Pc34-5

Pc 34-4

TELEPHONE 302/337-8254

Delmarva Drilling Co., Inc.

P. O. BOX 188 BRIDGEVILLE, DELAWARE 19933

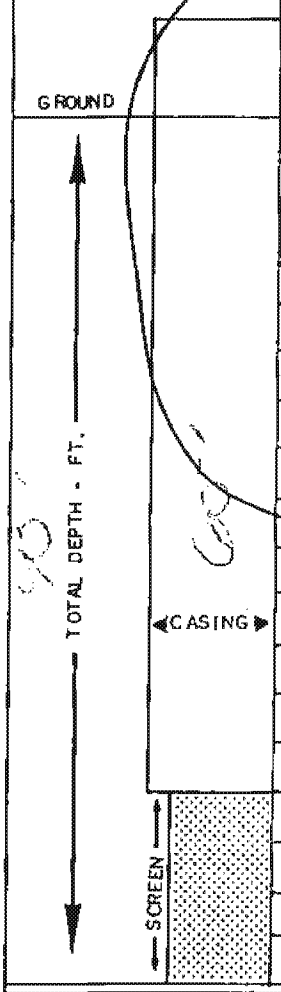
PC34-4 PC34-4

Water Well Contractors

CUSTOMER Town of Blades JOB 4250

ADDRESS Blades, Del. DATE 12-14-77

LOCATION 45' S.E. corner of [illegible]



FEET FROM GROUND SURFACE 0 TO.....	WELL LOG
0 - 10	fine sand
10 - 26	Gray clay
26 - 33	fine sand
33 - 45	fine coarse sand, gravel
45 - 94	fine coarse sand
[illegible] - 101	med. sand, iron ore
[illegible] - 110	[illegible]

WELL NO. 1	DIAMETER OF WELL [illegible]	DEPT. OF WELL 95'
HRS. PUMPED 3 1/2	SLOT SIZE [illegible]	TYPE OF CASING [illegible]
CAPACITY G.P.M. [illegible]	DRILLING MACHINE NO. [illegible]	LENGTH OF CASING [illegible]
STATIC LEVEL 17'	DRILLER A. [illegible]	DISTANCE TO TOP OF SCREEN [illegible]
PUMPING LEVEL [illegible]	GRAVEL [illegible]	TYPE SCREEN [illegible]
SPECIFIC CAPACITY [illegible]	BAGS OF CEMENT [illegible]	SIZE OF SCREEN [illegible]
PUMPED WITH [illegible]	DATE WELL COMPLETED [illegible]	
DEPTH OF CEMENT GROUT [illegible]	DRILLER'S HELPER [illegible]	
DEPTH GRAVEL PACKED [illegible]		

Ex. 4 CBI

WELL DRILLER'S SIGNATURE

PC34-5

Delmarva Drilling Co., Inc.

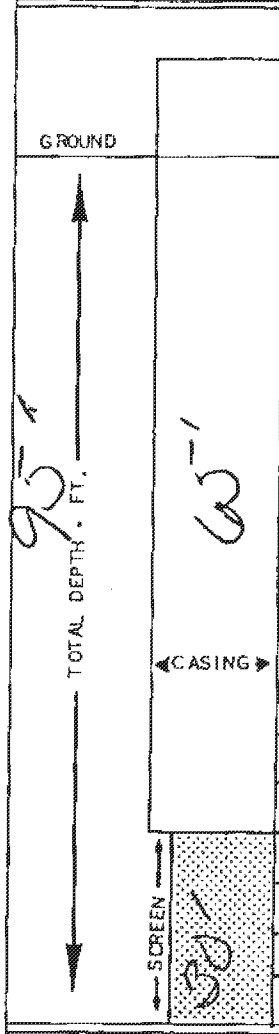
P. O. BOX 188 BRIDGEVILLE, DELAWARE 19933

Water Well Contractors

CUSTOMER Town of Blades JOB 4250

ADDRESS Blades, De. DATE

LOCATION 90' 7" SE of well #2, and 125' E. of road



FEET FROM GROUND SURFACE 0 TO.....	WELL LOG
0 - 1	top soil
1 - 6	fine to med. sand
6 - 21	gray clay w/fine sand
21 - 43	fine to med. brown sand
43 - 50	fine to coarse tan sand w/gravel
50 - 53	gravel
53 - 97	fine to coarse tan sand w/gravel
97 - 120	blue clay w/fine sand layers

WELL NO. 2	DIAMETER OF WELL 10"	DEPT. OF WELL 95'
HRS. PUMPED 3 1/2	SLOT SIZE .045	TYPE OF CASING steel
CAPACITY G.P.M. 35	DRILLING MACHINE NO. D3	LENGTH OF CASING 65'
STATIC LEVEL 17' 5"	DRILLER Kelley & Cowgill	DISTANCE TO TOP OF SCREEN 65-95'
PUMPING LEVEL 19' 5"	GRAVEL 2 & 3	TYPE SCREEN Stainless steel
SPECIFIC CAPACITY 17	BAGS OF CEMENT 50	SIZE OF SCREEN 8"
PUMPED WITH air pumper	DATE WELL COMPLETED 11-3-78	
DEPTH OF CEMENT GROUT 0-45'	DRILLER'S HELPER	
DEPTH GRAVEL PACKED 45-95'		

Ex. 4 CBI

WELL DRILLER'S SIGNATURE

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: PG34-06 DNREC Id: 40025

Record By: JFF (code) Date Filed: 5-09-91

GENERAL SITE DATA

Data Source: D (driller) G (DGS) N (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: PW#2 DRBC Id:

Latitude: **Ex. 9 Wells**

Lat-Long Accuracy: S (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 (Kent) 3 (New Castle) 5 (Sussex)

Quadrangle: SGE (code)

Topo Setting: C (stream channel) D (depression) E (dune) F (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: 304 (code) Altitude: 125 Altitude Method: A (altimeter) L (level) M (map) R (relative)

Delaware Mod. Grid: 0880081410

OWNER IDENTIFICATION

First: Middle Initial: Last: TOWN OF BLADES

Address: 973 BLADES (code)

Address:

City: State: Zip Code:

WELL DESCRIPTION

Drilling Contractor: DELAWARE DRILLING CO (code) 14

Date Drilled: 6-28-78 Depth Drilled: 119.

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) M (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) S (screen) T (sand point) U (unknown) W (walled)

Site Use: A (anoda) E (eng. test boring) G (geo/hydro research) O (observation) P (oil or gas) R (recharge) T (test) W (withdrawal) Z (other)

Site Status: A (abandoned) D (destroyed) I (in use) N (not in use) S (standby) U (unknown)

Water Use: A (agricultural) C (commercial) D (domestic) F (fire) G (geothermal) I (industrial) M (observation) O (other) P (public supply) R (irrigation) U (unknown)

Replacement Well: Y N

Replacement Reason: CL (chlorides) FE (iron) IW (inadequate quantity) NI (nitrate) OT (other) WF (well failure)

Geologic Unit: (code)

Aquifer Name: (code)

CASING

	top of casing	bottom of casing	diameter	material
1	0	66	10	S
2				
3				
4				

Casing Material: B (brick) C (concrete) F (fiber-glass) G (galvanized) O (other) P (PVC) R (rock or stone) S (steel) U (unknown)

OPENINGS

	top of opening	bottom of opening	diameter	material
1	66	96	8	S
2				
3				
4				

Opening Material: A (brass) B (bronze) C (concrete) F (fiber-glass) G (galvanized) M (monel) N (none) P (PVC) R (stainless steel) S (steel) U (unknown)

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: PG34-06 DNREC Id: 40025

Record By: JFF (code) Date Filed: 5-09-91

GENERAL SITE DATA

Data Source: D (driller) G (DGS) N (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: PW#2 DRBC Id:

Latitude: **Ex. 9 Wells**

Lat-Long Accuracy: S (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 Kent, 3 New Castle, 5 Sussex

Quadrangle: STGE (code)

Topo Setting: C (stream channel) D (depression) E (dune) F (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: 304 (code) Altitude: 12 Altitude Method: A (altimeter) L (level) M (map) R (relative)

Delaware Mod. Grid: 0818080410

OWNER IDENTIFICATION

First: Middle Initial: Last: TOWN OF ELADES

Address: 973 BLADES (code)

Address:

City: State: Zip Code:

WELL DESCRIPTION

Drilling Contractor: DELMARVA DRILLING CO (code) 14

Date Drilled: 6-28-78 Depth Drilled: 19

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) M (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) S (screen) T (sand point) U (unknown) W (walled)

GRAVEL PACK

Y N

Top 50.

Bottom 96.

GROUT

Y N

DGS ID

Top 0.

Bottom 50.

Type B (bentonite) C (cement) G (cuttings) O (other) U (unknown)

WATER-LEVEL DATA

Date 6-28-78

Time

Water Level 20.3

Correction .

Device Used A (air line) M (m-scope) O (other) R (reported) S (static level) T (tape down) W (water-level recorder)

LOG, TEST, AND SAMPLE DATA

Geologist's Log

Water Quality

Ditch Samples

Driller's Log

Supplemental File

Core Samples

Aquifer Test

GEOPHYSICAL LOG DATA

Caliper

Gamma-Density

Single Point Electric

Differential Single Point

Gamma Spectral

Sonic

Differential Temperature

Induction

Spherically Focused

Flowmeter

Multiple Point

Temperature

Gamma

Neutron

Other

DELAWARE GEOLOGICAL SURVEY
LITHOLOGIC LOG SCHEDULE

DGS ID: Pc34-06

Page No.:

Record By: ASA (code)

Date Filed: 5-7-91

Data Source: D (driller) G (DGS) (N) (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

LITHOLOGIC LOG DATA

Log Type: (D) Driller's G Geologist's

Depth: From 0. – To 1.

Description: TPSL

Description:

Depth: From 1. – To 11.

Description: F-M SD

Description:

Depth: From 11. – To 26.

Description: CL GRY

Description:

Depth: From 26. – To 34.

Description: F SD

Description:

(OVER)

Page No.

Depth From 34. To 56.

Description F-C SD+CL

Description

Depth From 56. To 97.

Description F-C SD TAN

Description

Depth From 97. To 110.

Description CL GRY BL

Description

Depth From . To .

Description

Description

Depth From . To .

Description

Description

Depth From . To .

Description

Description

DGS/1-84

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: Pc34-07 DNREC Id: 40024

Record By: JFF (code) Date Filed: 5-09-91

GENERAL SITE DATA

Data Source: D (driller) G (DGS) N (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: DRBC Id:

Latitude: Ex. 9 Wells Lat-Long Accuracy: S (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 (Kent) 3 (New Castle) 5 (Sussex) Quadrangle: SEE (code)

Topo Setting: C (stream channel) D (depression) E (dune) F (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: (code) Altitude: 12 Altitude Method: A (altimeter) L (level) M (map) R (relative)

Delaware Mod. Grid: 0880084 0

OWNER IDENTIFICATION

First: Middle Initial: Last: TOWN OF BLADES

Address: 913 BLADES (code)

Address:

City: State: Zip Code:

WELL DESCRIPTION

Drilling Contractor: Ex. 4 CBI (code) 14

Date Drilled: 6-27-78 Depth Drilled: 110

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) M (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) S (screen) T (sand point) U (unknown) W (walled)

DELAWARE GEOLOGICAL SURVEY
LITHOLOGIC LOG SCHEDULE

DGS ID: Pc34-07

Page No.:

Record By: ASA (code)

Date Filed: 5-9-91

Data Source: D (driller) G (DGS) N (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

LITHOLOGIC LOG DATA

Log Type: D (Driller's) G (Geologist's)

	From	To
Depth	0.	1.

Description: TPSL

Description:

	From	To
Depth	1.	11.

Description: F-m SD

Description:

	From	To
Depth	11.	26.

Description: CL GRY

Description:

	From	To
Depth	26.	34.

Description: F-SD

Description:

(OVER)

Page No.

	From	To
Depth	34.	56.

Description: F C SD + CL

Description:

	From	To
Depth	56.	97.

Description: F C SD TAN

Description:

	From	To
Depth	97.	110.

Description: CL GRY BL

Description:

	From	To
Depth	.	.

Description:

Description:

	From	To
Depth	.	.

Description:

Description:

	From	To
Depth	.	.

Description:

Description:

DGS/1-84

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: PG3A-08 DNREC Id:

Record By: ASA (code) Date Filed: 9-23-92

GENERAL SITE DATA

Data Source: D (driller) G (DGS) (N) (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: DRBC Id:

Latitude: Ex. 9 Wells

Lat-Long Accuracy: (S) (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 (Kent) 3 (New Castle) (5) (Sussex)

Quadrangle: SEE (code)

Topo Setting: C (stream channel) D (depression) E (dune) (F) (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: 30A (code) Altitude: 18. Altitude Method: A (altimeter) L (level) (M) (map) R (relative)

Delaware Mod. Grid: 0925 0920

OWNER IDENTIFICATION

First

Address

Address

City

Ex. 6 Personal Privacy (PP)

WELL DESCRIPTION

Drilling Contractor: (code) 1A

Date Drilled: 3-30-92 Depth Drilled: 77.

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) (M) (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) (S) (screen) T (sand point) U (unknown) W (walled)

GRAVEL PACK

Y N

Top 70.

Bottom 71.

GROUT

Y N

DGS ID

Top 1.

Bottom

Type B C G O U
bentonite cement cuttings other unknown

WATER-LEVEL DATA

Date

Time

Water Level 10.

Correction

Device Used A M O R S T W
air line, m-scope, other, reported, static level, tape down, water-level recorder

LOG, TEST, AND SAMPLE DATA

Geologist's Log

Water Quality

Ditch Samples

Driller's Log X

Supplemental File

Core Samples

Aquifer Test

GEOPHYSICAL LOG DATA

Caliper

Gamma-Density

Single Point Electric

Differential Single Point

Gamma Spectral

Sonic

Differential Temperature

Induction

Spherically Focused

Flowmeter

Multiple Point

Temperature

Gamma

Neutron

Other

DELAWARE GEOLOGICAL SURVEY
LITHOLOGIC LOG SCHEDULE

DGS ID: PC34-08

Page No.:

Record By:

ASR (code)

Date Filed: 9 - - -

Data Source: (D) G N O R S U
driller, DGS, DNREC, owner, other reported, USGS, unknown

LITHOLOGIC LOG DATA

Log Type: (D) G
Driller's, Geologist's

Depth From: 0. To: 1.

Description: TPSL

Description:

Depth From: 1. To: 15.

Description: SD [illegible]

Description:

Depth From: 15. To: 18.

Description: SD [illegible]

Description:

Depth From: 18. To: 30.

Description: CL [illegible]

Description:

(OVER)

Pc 34-08

Page No.

	From	To
Depth	36.	41.

Description: [illegible] w/ Fe[illegible]

Description:

	From	To
Depth	41.	70.

Description: CL gr[illegible] m [illegible]

Description:

	From	To
Depth	70.	77.

Description: SR [illegible] m [illegible]

Description:

	From	To
Depth	.	.

Description:

Description:

	From	To
Depth	.	.

Description:

Description:

	From	To
Depth	.	.

Description:

Description:

DGS/1-84

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

UPDATE

DGS ID: PC34-09 DNREC Id: 3114

Record By: ASA (code) Date Filed: 10-1-92

GENERAL SITE DATA

Data Source: D (driller) G (DGS) (N) (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: 3114 DRBC Id:

Latitude: Ex. 9 Wells

Lat-Long Accuracy: S (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 (Kent) 3 (New Castle) (5) (Sussex)

Quadrangle: SEE (code)

Topo Setting: C (stream channel) D (depression) E (dune) (F) (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: 30A (code) Altitude: 20. Altitude Method: A (altimeter) L (level) (M) (map) R (relative)

Delaware Mod. Grid: 09200920

OWNER IDENTIFICATION

First

Address

Address

Ex. 6 Personal Privacy (PP)

City: State: Zip Code:

WELL DESCRIPTION

Drilling Contractor: 1A (code)

Date Drilled: 1-4-72 Depth Drilled: 70.

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) (M) (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) (S) (screen) T (sand point) U (unknown) W (walled)

GRAVEL PACK

Y N

Top 60.

Bottom 70.

GROUT

Y N

DGS ID

Top .

Bottom .

Type B (bentonite) C (cement) G (cuttings) O (other) U (unknown)

WATER-LEVEL DATA

Date

Time

Water Level NA.

Correction .

Device Used A (air line) M (m-scope) O (other) R (reported) S (static level) T (tape down) W (water-level recorder)

LOG, TEST, AND SAMPLE DATA

Geologist's Log

Water Quality

Ditch Samples

Driller's Log X

Supplemental File

Core Samples

Aquifer Test

GEOPHYSICAL LOG DATA

Caliper

Gamma-Density

Single Point Electric

Differential Single Point

Gamma Spectral

Sonic

Differential Temperature

Induction

Spherically Focused

Flowmeter

Multiple Point

Temperature

Gamma

Neutron

Other

DELAWARE GEOLOGICAL SURVEY
LITHOLOGIC LOG SCHEDULE

DGS ID PF3A-09 Page No. 1 SEE

Record By ASA (code) Date Filed 9-30-92

Data Source: D (driller) G (DGS) N (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

LITHOLOGIC LOG DATA

Log Type: D (Driller's) G (Geologist's)

	From	To
Depth	0.	1.

Description: TPSL

Description:

	From	To
Depth	1.	11.

Description: SD F MT

Description:

	From	To
Depth	11.	18.

Description: SD F C ABD

Description:

	From	To
Depth	18.	24.

Description: CL GRN

Description:

(OVER)

Pc 34-09

Page No. 2

	From	To
Depth	24.	32.

Description: SD f wh

Description:

	From	To
Depth	32.	38.

Description: SD f wh w/ CL wh

Description:

	From	To
Depth	38.	56.

Description: SD f-c wh w/ GRV

Description:

	From	To
Depth	56.	70.

Description: SD f-m wh

Description:

	From	To
Depth	.	.

Description:

Description:

	From	To
Depth	.	.

Description:

Description:

DGS/1-84

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: PC34-11 DNREC Id: 66925

Record By: Athen (code) Date Filed: 9-11-93

GENERAL SITE DATA

Date Source: D (driller) G (DGS) (N) (DNREC) O (owner) R (other reported) S (USGS) U (unknown)

Local Id: DRBC Id:

Latitude: **Ex. 9 Wells**

Lat-Long Accuracy: (S) (sec) F (5 sec) T (10 sec) W (20 sec)

County: 1 (Kent) 3 (New Castle) (5) (Sussex)

Quadrangle: LPU (code)

Topo Setting: C (stream channel) D (depression) E (dune) (F) (flat) H (hilltop) K (sink) L (lake) M (marsh) O (offshore) S (hillside) U (upland draw) V (valley flat)

Drainage Basin: 304 (code) Altitude: 19. Altitude Method: A (altimeter) L (level) (M) (map) R (relative)

Delaware Mod. Grid: 0920080

by Address
N: 4274976
E: 446128

ADK

OWNER IDENTIFICATION

First:

Address:

Address:

City:

Ex. 6 Personal Privacy (PP)

WELL DESCRIPTION

Drilling Contractor: 608 (code)

Date Drilled: 10-11-86 Depth Drilled: 65.

Drill Method: A (air rotary) B (bored) C (cable tool) D (dug) E (augered) J (jetted) (M) (hydraulic rotary) P (air percussion) R (reverse rotary) U (unknown) V (driven) W (wash-drive)

Well Finish: C (concrete) H (horizontal gallery) N (not finished) O (open hole) P (perforated or slotted) (S) (screen) T (sand point) U (unknown) W (walled)

MAIL TO:
WATER SUPPLY BRANCH
DIVISION OF WATER RESOURCES
P.O. BOX 1401
DOVER, DELAWARE 19903

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED 31 DAYS AFTER CONSTRUCTION DATE

WELL COMPLETION REPORT

PERMIT NO. 56975E LOCAL ID

OWNER Ex. 6 Personal Privacy (PP)

CONSTRUCTION DATE 10-6-86

PURPOSE ☐ TEST ☑ PERMANENT

USE ☑ DOMESTIC ☐ COMMERCIAL ☐ IRRIGATION ☐ MONITOR ☐ HEAT PUMP RECHARGE ☐ OTHER (Specify) ☐ AGRICULTURAL ☐ INDUSTRIAL ☐ PUBLIC ☐ DEWATERING ☐ HEAT PUMP SUPPLY

IS THIS A REPLACEMENT WELL? YES ☑ NO ☐

ABANDONMENT DATE FOR OLD WELL 10-6-86

ABANDONMENT METHOD Cement grout end capped

DRILLING METHOD

☐ AUGERED ☐ DRIVEN ☑ MUD ROTARY ☐ OTHER (Specify) ☐ BORED ☐ JETTED ☐ REVERSE ☐ CABLE TOOL ☐ AIR ROTARY ☐ WASHED

TOTAL DEPTH DRILLED 65

CASING SEQUENCE

CASING TOP	0	
CASING BOTTOM	22	
CASING DIAMETER	4	
CASING MATERIAL	PVC	

SCREEN SEQUENCE

SCREEN TOP	22	
SCREEN BOTTOM	62	
SCREEN DIAMETER	4	
SCREEN MATERIAL	PVC	

WRITE ADDITIONAL SEQUENCES ON REVERSE. INCLUDE INCREMENTS FROM TOP TO BOTTOM. FIRST SEQUENCE MUST BE ON GROUND SURFACE

GROUT TYPE CEMENT ☐ BENTONITE CLAY ☑
OTHER
FROM 0 TO 22 FEET

NONGROUT BACKFILL OF WELL ANNULUS
TYPE Clay FROM 0 TO 30 FEET

GRAVEL PACK TYPE #2
FROM 22 TO 65 FEET

STATIC WATER LEVEL DATE 10-6-86
12 FT (Below, Above) GROUND SURFACE

PUMPING WATER LEVEL 16 FT BELOW GRADE
AFTER 2 HOURS AT 60 GPM

WELL HEAD COMPLETION:

TYPE PITLESS ADAPTOR ☐
OTHER ☐
12 INCHES ABOVE GRADE

TYPE OF PERMANENT PUMP INSTALLED:

PUMP MANUFACTURE n/a
RATED CAPACITY (GPM)
PUMP INTAKE SETTING ____ FT BELOW GRADE

THE COMPLETED WELL IS?

	YES	NO
A. AT LEAST 5' FROM ANY OVERHANG	☑	☐
B. AT LEAST 50' FROM ANY SEPTIC TANK	☑	☐
C. AT LEAST 10' FROM TOWN SEWER LINE	☑	☐
D. AT LEAST 100' FROM THE NEAREST EDGE OF ANY TILE FIELD	☑	☐

THE NEAREST NEIGHBORS (CIRCLE ONE)

SEPTIC TILE FIELD CESSPOOL OR PRIVY
IS ____ FROM COMPLETED WELL.
IS COMPLETED WELL LOCATED AS SHOWN ON APPLICATION FORM? ☑ ☐
IF NO, DESCRIBE LOCATION CHANGE OR OTHER COMMENTS

DW
PC34-11

DRILLERS LOG DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
Top Soil	0	1
Tan fine to med sand	1	7
Tan fine to coarse sand w/gravel	7	27
Grey Clay	27	32
Tan fine to coarse sand	32	62
Tan fine to med sand w/clay	62	65

SUPPLEMENTAL DRILLERS LOG ATTACHED YES ☐ NO ☑
PAGE 1 OF 1 PAGES
COMPANY NAME AWWS 10/6/86

Ex. 4 CBI

WHITE - DNREC CANARY - CONTRACTOR PINK - OWNER

Document 20-06/18/05/10

ED_005024_00000489-00161

APPENDIX C

Phase I (2012) RI Information

C-1 Photographs
C-2 Soil Boring Logs
C-3 Soil Sample Laboratory Summary Data Packages
Total Chromium
Synthetic Precipitation Leaching Procedure
C-4 Phase I RI Monitor Well /Soil Boring
C-5 Phase I RI Wells - Groundwater Sample Collection Field Sheets
C-6 Groundwater Sample Laboratory Summary Data Package –May 2012

4-18-2012

Photo 1: View of area of Former Chromium Tanks where soil samples were collected using Hand Auger at the locations shown. Note concrete slab present and surrounding elevated wood floor (showing pre-existing conditions).

Photo 2: View of subsurface vault and wellhead of existing on-site well (no longer in use).

Photo 3: Same as above, closer view.

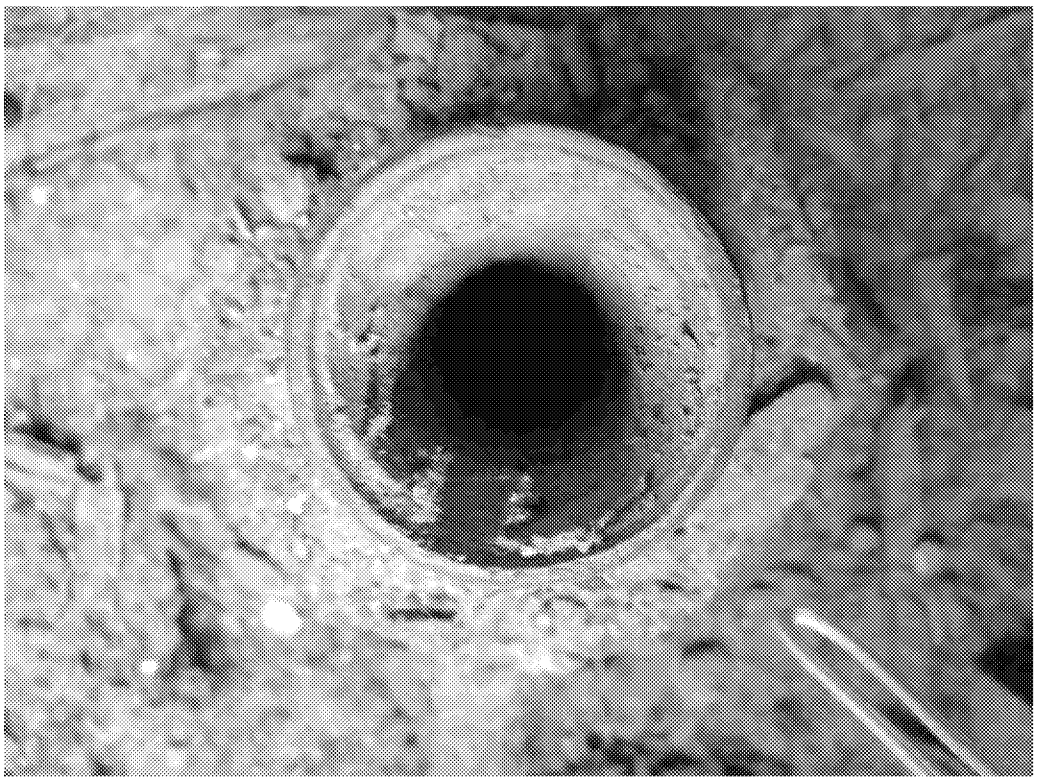


Photo 4: On-site existing well pipe, closer view.

Appendix C-2
Descriptive Logs
Hand-Augered Soil Borings

SOIL BORING DESCRIPTIVE LOG

Location No. HA-1

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6		0.0	Brown fine to medium SAND, some gravel, little to trace silt, soil color transitions
			to tan at approximately 4.8 feet, moist at approximately 7.0 feet, wet at
			approximately 8.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.5 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 3.0 to 5.0 and 6.5 to 8.5 feet below the ground surface at 0955 and 1010 hrs.

Location No. HA-1

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background.

SOIL BORING DESCRIPTIVE LOG

Location No. HA-2

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6		0.0	Brown fine to medium SAND, little silt, trace gravel, soil color transitions to light
			brown at approximately 0.9 feet, slightly musty odor, soil color transitions to
			tan at approximately 5.5 feet, moist at approximately 7.3 feet, wet at
	...		approximately 8.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.7 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 3.0 to 5.0 and 6.5 to 8.5 feet below the ground surface at 1025 and 1035 hrs.

Location No. HA-2

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background

SOIL BORING DESCRIPTIVE LOG

Location No. HA-3

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6	1.0	0.0	Brown fine to medium SAND, little gravel trace silt
1.0			Tan fine to medium SAND, trace silt, moist at approximately 7.0 feet, pockets of
	...		little to some silt below approximately 7.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.8 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 3.0 to 5.0 and 6.5 to 8.5 feet below the ground surface at 1055 and 1115 hrs.

Location No. HA-3

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background.

SOIL BORING DESCRIPTIVE LOG

Location No. HA-4

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6		0.0	Brown fine to medium SAND, little gravel to approximately 1.0 feet, trace silt, soil
			color transitions to light orange, brown at approximately 1.5 feet, little silt below
			approximately 2.5 feet, soli color transitions to tan at approximately 5.0 feet, moist
	...		at approximately 7.0 feet, wet at approximately 8.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.8 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 0.0 to 2.0 and 3.0 to 5.0 feet below the ground surface at 1152 and 1158 hrs.

Location No. HA-4

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background

SOIL BORING DESCRIPTIVE LOG

Location No. HA-5

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6		0.0	Brown, light orange brown fine to medium SAND, little to trace silt, soil color
	...		transitions to tan at approximately 5.3 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.5 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 0.0 to 2.0 and 3.0 to 5.0 feet below the ground surface at 1233 and 1243 hrs.

Location No. HA-5

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background.

SOIL BORING DESCRIPTIVE LOG

Location No. HA-6

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6	1.0	0.0	Brown fine to medium SAND, trace silt
1.0		0.0	Orange, brown fine to medium SAND, little to trace silt, soil color transitions to
	...		light brown, tan at approximately 5.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.5 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground. surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 0.0 to 2.0 and 6.5 to 8.5 feet below the ground surface at 1313 and 1325 hrs.

Location No. HA-6

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background.

SOIL BORING DESCRIPTIVE LOG

Location No. HA-7

TEN BEARS ENVIRONMENTAL, L.L.C.

Project: Procino Plating Property			Project No. 11-1027.A	Date: 4/26/2012
Location: Seaford, Delaware			Surface Elevation: NA	Datum: NA
Earthwork Contractor: NA	Operator: NA	Drilling Equipment: Hand Auger	Weather: Interior Hand Auger	Logged by: BKE

Depth (feet) From	Depth (feet) To	PID (deflection units)	Generalized Soil Description
0.0	0.6	0.0	CONCRETE slab
0.6	0.8	0.0	Brown fine to medium SAND, trace silt
0.8	...	0.0	Orange, brown fine to medium SAND, little to trace silt, soil color transitions to tan at approximately 5.0 feet

Notes:

1. The soil boring was terminated at a depth of approximately 8.5 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 8.0 feet below the ground surface.
3. Soil samples were collected for laboratory analysis at depth intervals of approximately 0.0 to 2.0 and 6.5 to 8.5 feet below the ground surface at 1353 and 1405 hrs.

Location No. HA-7

Page 1 of 1

* PID = Photo-ionization detector, readings are in deflection units above background.

Appendix C-3
Soil Samples
Laboratory Summary Data Package

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

May 09, 2012

Project: 11-1027.A

Submittal Date: 04/30/2012
Group Number: 1305622
SDG: TBF86
PO Number: 11-1027.A
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LLI) #
HA-1 (3-5') Grab Soil	6634362
HA-1 (6.5-8.5') Grab Soil	6634363
HA-2 (3-5') Grab Soil	6634364
HA-2 (6.5-8.5') Grab Soil	6634365
HA-3 (3-5') Grab Soil	6634366
HA-3 (6.5-8.5') Grab Soil	6634367
HA-3 (6.5-8.5')MS Grab Soil	6634368
HA-3 (6.5-8.5')SD Grab Soil	6634369
HA-3 (6.5-8.5')DUP Grab Soil	6634370
HA-4 (0-2') Grab Soil	6634371
HA-4 (3-5') Grab Soil	6634372
HA-5 (0-2') Grab Soil	6634373
HA-5 (3-5') Grab Soil	6634374
Rinse Blank Grab Water	6634375

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI
1 COPY TO Data Package Group

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-1 (3-5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW 6634362
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 09:55 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA1-3 SDG#: TBF86-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	126	0.144	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	2.8	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW-846 6010B	1	121255708006	05/08/2012 10:34	Ex. 4 CBI	1
05708	SW SW846 ICP/ICP MS Digest	SW-846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-1 (6.5-8.5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634363
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:10 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA1-6 SDG#: TBF86-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	199	0.151	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	7.0	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:38	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-2 (3-5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634364
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:25 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA2-3 SDG#: TBF86-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	5.84	0.143	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	4.2	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:49	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-2 (6.5-8.5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634365
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:35 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA2-6 SDG#: TBF86-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	52.4	0.149	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	7.9	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:52	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-3 (3-5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634366
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:55 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA3-3 SDG#: TBF86-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	2.12	0.143	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	4.1	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:56	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-3 (6.5-8.5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634367
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:15 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA3-6 SDG#: TBF86-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	11.6	0.156	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	12.0	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:12	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-3 (6.5-8.5')MS Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634368
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:15 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA3-6 SDG#: TBF86-06MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	35.2	0.156	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00118	Moisture	n.a.	12.0	0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:23	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00118	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-3 (6.5-8.5')SD Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634369
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:15 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA3-6 SDG#: TBF86-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	37.4	0.158	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00118	Moisture	n.a.	12.0	0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:27	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00118	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-3 (6.5-8.5')DUP Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634370
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:15 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA3-6 SDG#: TBF86-06DUP

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	12.2	0.158	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00118	Moisture	n.a.	12.0	0.50	1
00121	Moisture Duplicate	n.a.	10.7	0.50	1

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 10:19	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00118	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1
00121	Moisture Duplicate	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-4 (0-2') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634371
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:52 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA4-0 SDG#: TBF86-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	37.8	0.142	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	3.4	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 11:00	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-4 (3-5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634372
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 11:58 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA4-3 SDG#: TBF86-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	64.8	0.141	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	4.8	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 11:03	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-5 (0-2') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634373
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 12:33 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA5-0 SDG#: TBF86-09

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	11.3	0.145	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	4.4	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 11:06	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-5 (3-5') Grab Soil
Procino Plating - 11-1027.A

LLI Sample # SW6634374
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 12:43 by BKE

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

HA5-3 SDG#: TBF86-10

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/kg**	**mg/kg**	
06951	Chromium	7440-47-3	14.3	0.140	1
Wet Chemistry		**SM20 2540 G**	**%**	**%**	
00111	Moisture	n.a.	3.7	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06951	Chromium	SW846 6010B	1	121255708006	05/08/2012 11:10	Ex. 4 CBI	1
05708	SWSW846 ICP/ICP MS Digest	SW846 3050B	1	121255708006	05/07/2012 08:38		1
00111	Moisture	SM20 2540 G	1	12123820006A	05/02/2012 13:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: **Rinse Blank Grab Water**
Procino Plating - 11-1027.A

LLI Sample # WW6634375
LLI Group # 1305622
Account # 10855

Project Name: 11-1027.A

Collected: 04/27/2012 13:15

Submitted: 04/30/2012 17:10
Reported: 05/09/2012 11:42

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

RINSE SDG#: TBF86-11RB*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.0011 J	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121231848003	05/04/2012 05:27	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121231848003	05/03/2012 12:48		1

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 05/09/12 at 11:42 AM

Group Number: 1305622

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 121231848003	Sample number(s): 6634375							
Chromium	N.D.	0.0011	mg/l	98	99	90-110	1	20
Batch number: 121255708006	Sample number(s): 6634362-6634374							
Chromium	N.D.	0.137	mg/kg	101		80-120		
Batch number: 12123820006A	Sample number(s): 6634362-6634374							
Moisture				100		99-101		
Moisture				100		99-101		
Moisture Duplicate				100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 121255708006	Sample number(s): 6634362-6634374 UNSPK: 6634367 BKG: 6634367								
Chromium	106	115	75-125	6	20	10.2	10.7	5	20
Batch number: 12123820006A	Sample number(s): 6634362-6634374 BKG: 6634367								
Moisture						12.0	10.7	11	13
Moisture						12.0	10.7	11	15
Moisture Duplicate						12.0	10.7	11	15

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 Group # 1305622 Sample # 6631362-75

COC # 305630 page 1 of 2 4-2

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: TEN BEARS ENVIRONMENTAL Acct. #: 10855
Project Name/#: 11-1027 A PWSID #:
Project Manager: Ex. 4 CBI P.O.#:
Sampler: BKE Quote #:
Name of state where samples were collected: DE

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FSC:
SCR#: 121273

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix: Soil	Sediment	Water: Potable	Ground	Surface	NPDES	Other:	(4) Total # of Containers	(5) Analyses Requested / Preservation Codes: Total Chromium 6010	Remarks	(6) Temperature of samples upon receipt (if requested)
HA-1 (3'-5')	4/26/12	0955	X		X							1	X	temp 0.8-1.2°C	
HA-1 (6.5-8.5')		1010	X		X							1	X		
HA-2 (3'-5')		1025	X		X							1	X		
HA-2 (6.5-8.5')		1035	X		X							1	X		
HA-3 (3'-5')		1055	X		X							1	X		
HA-3 (6.5-8.5')		1115	X		X							2	X	← QA/QC HERE	
HA-4 (0'-2')		1152	X		X							1	X		
HA-4 (3'-5')		1158	X		X							1	X		
HA-5 (0-2)		1233	X		X							1	X		
HA-5 (3-5)		1243	X		X							1	X		

(7) **Turnaround Time Requested** (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #: (302) 731-8633
E-mail address: TENBEARSBR@COMCAST.NET

(8) **Data Package Options** (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(if yes, indicate QC sample and submit triplicate sample volume)

Relinquished by:	Date	Time	Received by:	Date	Time
Ex. 4 CBI	4/26/12	1310	Ex. 4 CBI	4/26/12	1115
Ex. 4 CBI	4/27/12	13:35	Ex. 4 CBI	4/27/12	13:35
Ex. 4 CBI	4/30/12	17:12	Ex. 4 CBI		
Relinquished by:	Date	Time	Ex. 4 CBI	Date	Time
Relinquished by:	Date	Time	Ex. 4 CBI	4/30/12	1710

(9)

DR 17526 DMcCoch

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management 7044.01

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 Group # 1305622 Sample # 6634362-75

COC # 305582 page 2 of 2 4-2

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: Ten Bears Acct. #:

Project Name/#: 11-1027.A PWSID #:

Project Manager: P.O.#:

Sampler: Quote #:

Name of state where samples were collected:

For Lab Use Only
FSC:
SCR#: 121478

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(6) Temperature of samples upon receipt (if requested)

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix: Soil	Sediment	Water: Potable	Ground	Surface	NPDES	Other:	(4) Total # of Containers	(5) Analyses Requested / Preservation Codes: Total Chromium	Remarks
Rinse Blank	4-27-12	13:15	X				X					1	X	temp 0.8-1.2°C

(7) **Turnaround Time Requested** (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #:
E-mail address:

(8) **Data Package Options** (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(if yes, indicate QC sample and submit triplicate sample volume)

Ex. 4 CBI

Date	Time
4/27/12	0885
4/27/12	1040
4/27/12	1315
4/30/12	1710

Ex. 4 CBI

(9)

Date	Time
4/27/12	0885
4/27/12	10:40
4/27/12	13:35
4/30/12	1710

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management 7044.01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

June 28, 2012

Project: 11-1027.A

Submittal Date: 06/25/2012
Group Number: 1318120
PO Number: 11-1027.A
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LLI) #
HA-1 (3'-5') Grab Soil	6700641
HA-1 (6.5-8.5) Grab Soil	6700642
HA-2 (6.5-8.5') Grab Soil	6700643

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-1 (3'-5') Grab Soil
SPLP NON VOLATILE EXTRACTION
11-1027.A

LLI Sample # TL 6700641
LLI Group # 1318120
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 09:55 by BKE

Submitted: 06/25/2012 17:10
Reported: 06/28/2012 14:03

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.132	0.0011	0.0150	1

General Sample Comments

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121795705001	06/28/2012 09:03	Ex. 4 CBI	1
05705	WWTL SW846 ICP Digest (tot)	SW846 3010A	1	121795705001	06/27/2012 22:10		1
01567	Synthetic Precipitation Leach	SW846 1312	1	12178-482-1567	06/26/2012 13:50		n.a.

*=This limit was used in the evaluation of the final result

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-1 (6.5-8.5) Grab Soil
SPLP NON VOLATILE EXTRACTION
11-1027.A

LLI Sample # TL 6700642
LLI Group # 1318120
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:10 by BKE

Submitted: 06/25/2012 17:10
Reported: 06/28/2012 14:03

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.245	0.0011	0.0150	1

General Sample Comments

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121795705001	06/28/2012 09:43	Ex. 4 CBI	1
05705	WWTL SW846 ICP Digest (tot)	SW846 3010A	1	121795705001	06/27/2012 22:10		1
01567	Synthetic Precipitation Leach	SW846 1312	1	12178-482-1567	06/26/2012 13:50		n.a.

*=This limit was used in the evaluation of the final result

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: HA-2 (6.5-8.5') Grab Soil
SPLP NON VOLATILE EXTRACTION
11-1027.A

LLI Sample # TL 6700643
LLI Group # 1318120
Account # 10855

Project Name: 11-1027.A

Collected: 04/26/2012 10:35 by BKE

Submitted: 06/25/2012 17:10
Reported: 06/28/2012 14:03

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.138	0.0011	0.0150	1

General Sample Comments

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121795705001	06/28/2012 09:47	Ex. 4 CBI	1
05705	WWTL SW846 ICP Digest (tot)	SW846 3010A	1	121795705001	06/27/2012 22:10		1
01567	Synthetic Precipitation Leach	SW846 1312	1	12178-482-1567	06/26/2012 13:50		n.a.

*=This limit was used in the evaluation of the final result

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 06/28/12 at 02:03 PM

Group Number: 1318120

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 121795705001	Sample number(s): 6700641-6700643								
Chromium	N.D.	0.0011	0.0150	mg/l	103		80-120		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 121795705001	Sample number(s): 6700641-6700643 UNSPK: 6700641 BKG: 6700641								
Chromium	91	90	75-125	1	20	0.132	0.134	2	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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For Lancaster Laboratories use only 1318120 / 670064-43 page 1 of 2

Acct. # 10855 Group # ~~1305677~~ 1309708 Sample # ~~1663961-75~~ ~~1663962-52~~ **COC # 305630** 4-2

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: TEN BEARS ENVIRONMENTAL Acct. #: 10855
Project Name/#: 11-1027 A PWSID #:
Project Manager: Ex. 4 CBI P.O.#:
Sampler: BKE Quote #:
Name of state where samples were collected: DE

For Lab Use Only
FSC:
SCR#: 121213

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix (4): Soil	Sediment	Water	Potable / NPDES	Ground / Surface	Other:	Total # of Containers	(5) Analyses Requested / Preservation Codes: Total Chromium (6oz)		TCLP Chromium per BK min 5/17/12		SPLP Chromium				Remarks	(6) Temperature of samples upon receipt (if requested)
HA-1 (3'-5')	4/26/12	0955	X		X						1	X		X		X				temp 0.8-1.2°C	
HA-1 (6.5-8.5')		1010	X		X						1	X		X		X					
HA-2 (3'-5')		1025	X		X						1	X									
HA-2 (6.5-8.5')		1035	X		X						1	X		X		X					
HA-3 (3'-5')		1055	X		X						1	X									
HA-3 (6.5-8.5')		1115	X		X						2	X								← QA/QC HERE	
HA-4 (0'-2')		1152	X		X						1	X									
HA-4 (3'-5')		1158	X		X						1	X									
HA-5 (0-2)		1233	X		X						1	X									
HA-5 (3-5)		1243	X		X						1	X									

(7) Turnaround Time Requested (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #: (302) 731-8633
E-mail address: TENBEARSBR@COMCAST.NET

Ex. 4 CBI

Relinquished by:	Date	Time	Received by:	Date	Time
	4/26/12	1315		4/26/12	1115
	4/27/12	13:35		2-13-35	
	5/1/12	17:10			
Relinquished by:					

Ex. 4 CBI

(8) Data Package Options (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13
DE 1-15C4 DRCMA

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume)

(9) Date 4/26/12 Time 1115

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management 7044.01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Appendix C-4
Phase I RI Monitor Well /Soil Boring Logs

Boring MW-7

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, 60s	Grass	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0		1.8	Dark brown fine to medium SAND, little to some silt, little	0.0
				0.2		organics (apparent topsoil)	
			0.2			Brown, orange fine SAND, little silt,	0.0
2	4	8			2.9	SAME, trace gravel, some light brown soils	0.0
3	8	12			1.5	SAME, wet at approximately 9.0 feet, little to some silt from	0.0
						approximately 8.8 to 9.3 and purple, dark gray mottling	
4	12	16		12.2	2.0	SAME	0.0
			12.2			Gray fine to medium SAND, trace silt, trace gravel, trace	0.0
				12.9		wood	
			12.9	13.7		Light brown, light gray, yellow fine sand, trace to little silt	0.0
			13.7			Light brown, yellow fine to coarse SAND, little gravel, trace	0.0
						silt	
5	16	22		17.9	2.9	SAME, mostly light brown, gray little to some gravel	0.0
			17.9	18.2		Gray SILT / clay little fine sand, red, orange mottling	0.0
			18.2			Brown, orange, red rine SAND, soli has purple tint below	0.0
						approximately 18.7 to bottom of sample, musty / metallic	
						odor	

* PID = Photo-ionization detector, readings are in deflection units above background.

TEN BEARS ENVIRONMENTAL, L.L.C
NEWARK, and MILTON, DE

Boring MW-7

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, 60s	Grass	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
6	22	30			2.9	Same, metallic odor, purple tint to soil from approximately	0.0
				23.1		22.5 to 23.0 feet	
			23.1			Driller informed TBE that a layer of clay was encountered at	0.0
						a depth of approximately 27.0 feet based on the response of	
						the drilling tools, Gray, orange, purple SILT / clay, little fine to	
						medium sand, soils very stiff from approximately 23.1 to 23.5	
						feet, soils become more plastic below approximately 23.5	
				28.0		feet, metallic odor still remains	
			28.0			Orange, gray fine to coarse SAND, trace silt, trace gravel,	0.0
				...		little metallic odor not as evident as above	

Notes:

1. The boring was terminated at a depth of approximately 30.0 feet below the ground surface.
2. Wetness was observed on the drilling tools at a depth of approximately 9.0 feet below the existing ground suface.
3. Discreet sampling was performed at depths below approximately 16.0 feet.
4. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 7.5 to 27.5 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.5 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with a concrete curbox set in sakrete.

Boring MW-8

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, light drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.1	3.0	Gray GRAVEL, little silt, little fine to coarse sand	0.0
			0.1	0.8		Brown fine SAND, little silt, trace gravel	0.0
			0.8	1.4		Dark brown fine SAND, little silt,	0.0
			1.4			Brown, orange fine SAND, little silt	0.0
2	4	8			2.8	SAME, soil color is brown, light brown, orange, wet at bottom	0.0
						0.5 feet of sample	
3	8	12			2.4	SAME, sample saturated, soil color transitions to light gray	0.0
				10.0		at approximately 8.9 feet	
			10.0			Brown, yellow fine to coarse SAND, little gravel, trace silt	0.0
4	12	18		12.6	2.9	SAME	0.0
			12.6			Gray fine to medium SAND, trace to little gravel, trace to	0.0
				13.9		little silt	
			13.9			Brown, yellow, gray fine to coarse SAND, trace to little gravel,	0.0
						trace silt	
5	18	24		18.1	3.5	SAME	0.0
			18.1	18.6		Brown, orange fine SAND, little silt	0

* PID = Photo-ionization detector, readings are in deflection units above background.

TEN BEARS ENVIRONMENTAL, L.L.C
NEWARK, and MILTON, DE

Boring MW-8

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, light drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
			18.6	19.1		Gray fine to medium SAND and silt	0.0
			19.1	21.0		Light gray fine to medium SAND, trace silt	0.0
			21.0			Gray SILT / clay, little orange mottling, little fine sand, top of	0.0
						clay layer estimated to be at approximately 23.5 feet due to	
						soil compaction in sample, total of approximately 1.0 feet of	
				...		clay recovered including soil in the sample shoe	

Notes:

1. The boring was terminated at a depth of approximately 24.0 feet below the ground surface.
2. Wetness was observed on the drilling tools at a depth of approximately 7.5 feet below the existing ground suface.
3. Discreet sampling was performed at depths below approximately 12.0 feet.
4. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 4.0 to 24.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.5 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with a concrete curbox set in sakrete.

Boring MW-8

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, light rain 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.1	2.4	Gray GRAVEL, little fine to coarse sand, little silt	0.0.
			0.1	0.9		Dark brown fine SAND, little silt, trace gravel	0.0
			0.9			Light brown, brown, orange, fine SAND, little silt, trace gravel, soil transitions to orange fine to medium sand at approximately 2.0 feet	0.0
2	4	8			2.6	SAME, light brown, brown, orange mostly fine SAND, little medium sand, bottom 0.5 feet of sample is wet	0.0
3	8	12			3.3	SAME, brown, light brown, gray fine SAND, trace to little silt, soil color transitions to mostly gray at approximately 10.0 feet, sample is saturated	0.0
4	12	16			3.2	SAME, gray, brown fine to medium SAND, little gravel, little silt	0.0
			14.0	14.2		Gray SILT, some fine sand	0.0
			14.2	14.6		Orange, dark orange fine to coarse SAND, little gravel, trace silt	0.0
			14.6			Gray, yellow fine to coarse SAND, little to some gravel, trace silt	0.0
5	16	22		17.3	2.7	SAME	0

* PID = Photo-ionization detector, readings are in deflection units above background.

TEN BEARS ENVIRONMENTAL, L.L.C
NEWARK, and MILTON, DE

Boring MW-8

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Page 1 of

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.A
Drilling Agency	**Driller**	**Date Started:**	4/26/2012
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	4/26/2012
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	2-inch diameter, 4-foot long continuous macrocore sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, light drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
			17.3			Light gray fine to medium SAND, trace to little silt, trace	0.0
				18.2		gravel	
			18.2			Gray, yellow fine to coarse SAND, little gravel, trace silt	0.0
6	22	28		22.1	3.0	SAME	0.0
			22.1			Gray fine to medium SAND, trace to little silt, trace to little	0.0
				23.2		gravel	
			23.2			Yellow, brown, gray fine to coarse SAND, little to some gravel,	0.0
				24.0		trace silt	
			24.0			Clay layer estimated to be at approximately 26.5 feet based	0.0
						on soil compaction in sample, orange, gray SILT / clay, trace	
						to little fine sand, soil color transitions to gray at	
				...		approximately 24.4 feet	

Notes:

1. The boring was terminated at a depth of approximately 28.0 feet below the ground surface.
2. Wetness was observed on the drilling tools at a depth of approximately 7.5 feet below the existing ground suface.
3. Discreet sampling was performed at depths below approximately 12.0 feet.
4. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 7.0 to 27.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 5.0 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with a concrete curbox set in sakrete.

Appendix C-5
Phase I RI
Groundwater Sample Collection
Field Data Sheets

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-6

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 17.7 feet	10.59 feet	7.11 feet	± 0.25 gallons	5/9/2012 0909 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1505 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1510	5.77	0.213	16.7	8.96	17.23	316
1515	5.74	0.209	15.6	8.30	17.15	314
1520	5.72	0.209	14.9	7.95	17.11	325
1525	5.71	0.209	16.1	7.78	17.09	328
1530	5.71	0.209	16.2	7.66	17.08	330

Sample collected for laboratory analysis at 1530 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 12.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-6

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 17.7 feet	10.59 feet	7.11 feet	± 0.25 gallons	5/9/2012 0909 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1430 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1431	5.76	0.145	0.0	10.12	17.39	251
1440	5.72	0.204	376	8.59	17.29	272
1445	5.75	0.207	99.1	8.26	17.17	286
1450	5.73	0.208	69.5	8.18	17.13	294
1455	5.73	0.208	30.2	8.10	17.11	300

Sample collected for laboratory analysis at 1455 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 1 Liter HNO_3 (filtered) 1
1 Liter HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 16.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-7 (DNREC WSS ID: 238779)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 29.47 feet	10.50 feet	18.97 feet	± 1.2 gallons	5/9/2012 0910 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1345 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1350	5.46	0.157	101	6.57	15.38	252
1355	5.44	0.156	39.0	6.76	15.34	256
1400	5.43	0.156	22.9	6.95	15.34	256
1405	5.43	0.156	12.9	6.86	15.31	258
1410	5.41	0.156	10.8	6.67	15.28	258

Sample collected for laboratory analysis at 1410 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 12.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-7 (DNREC WSS ID: 238779)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 29.47 feet	10.50 feet	18.97 feet	± 1.2 gallons	5/9/2012 0910 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1305 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1310	5.57	0.156	800 (flashing)	10.76	15.47	262
1315	5.48	0.155	147	6.95	15.39	264
1320	5.45	0.155	42.7	6.68	15.35	263
1325	5.44	0.156	22.6	6.63	15.36	263
1330	5.43	0.156	20.8	6.53	15.35	262

Sample collected for laboratory analysis at 1330 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 27.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-8 (DNREC WSS ID: 238780)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.04 feet	7.86 feet	16.18 feet	± 1.01 gallons	5/9/2012 0857 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1155 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1200	6.02	0.210	84.5	11.07	15.84	291
1205	5.96	0.215	79.7	9.63	15.74	290
1210	5.95	0.215	43.8	9.22	15.71	288
1215	5.94	0.216	13.1	8.92	15.72	288
1220	5.94	0.218	9.4	8.83	15.64	288

Sample collected for laboratory analysis at 1220 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 9.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-8 (DNREC WSS ID: 238780)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.04 feet	7.86 feet	16.18 feet	± 1.01 gallons	5/9/2012 0857 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1110 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1115	5.97	0.237	400	6.28	16.17	293
1120	5.85	0.237	283	5.91	15.71	299
1125	5.82	0.238	24.9	5.78	15.64	299
1130	5.81	0.238	10.0	5.70	15.57	297
1135	5.81	0.238	6.0	5.70	15.59	297

Sample collected for laboratory analysis at 1135 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 23.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-9 (DNREC WSS ID: 238781)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.57 feet	7.48 feet	19.09 feet	± 1.2 gallons	5/9/2012 0848 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 1010 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1015	5.92	0.316	46.7	3.72	16.19	243
1020	5.89	0.307	22.5	2.96	15.90	247
1025	5.87	0.306	18.4	2.83	15.79	250
1030	5.86	0.303	9.0	4.82	15.80	250
1035	5.87	0.302	5.2	4.63	15.76	251

Sample collected for laboratory analysis at 1035 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 9.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: MW-9 (DNREC WSS ID: 238781)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.57 feet	7.48 feet	19.09 feet	± 1.2 gallons	5/9/2012 0848 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 ml/min
PURGE START TIME: 0920 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 to 3.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
0924	5.71	0.290	800 (flashing)	8.80	17.13	179
0930	5.78	0.273	117	8.14	16.61	232
0935	5.79	0.272	57.5	7.64	16.49	247
0940	5.79	0.273	42.6	6.41	16.37	252
0945	5.80	0.273	26.4	6.25	16.28	256

Sample collected for laboratory analysis at 0945 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 25.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: Private Well

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 30.02 feet	9.01 feet	21.01 feet	± 13.9 gallons	5/9/2012 0905 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 400 to 500 ml/min
PURGE START TIME: 1640 hrs.
TOTAL VOLUME PURGED: Approximately 3.0 to 4.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1645	7.26	0.345	28.4	11.73	15.08	-125
1650	7.33	0.345	30.7	8.39	15.08	-136
1655	7.44	0.346	35.0	7.35	15.08	-159
1700	7.51	0.346	30.8	6.61	15.05	-182
1705	7.54	0.346	39.5	6.14	15.04	-194

Sample collected for laboratory analysis at 1705 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 11.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 11-1027.B

WELL ID: Private Well

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 30.02 feet	9.01 feet	21.01 feet	± 13.9 gallons	5/9/2012 0905 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 500 ml/min
PURGE START TIME: 1555 hrs.
TOTAL VOLUME PURGED: Approximately 3.0 to 4.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1600	6.57	0.349	264	9.71	16.15	8
1605	6.54	0.355	229	8.17	15.98	-9
1610	6.54	0.357	185	7.58	15.97	-12
1615	6.50	0.360	120	6.63	15.96	-10
1620	6.46	0.359	76.6	6.10	15.94	-7

Sample collected for laboratory analysis at 1620 hrs.

Laboratory analysis requested: Total Chromium, Dissolved Chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml HNO_3 (unfiltered) 1

Comments: Intake was set at approximately 29.0 feet below the top of the well casing.

Appendix C-6
May 2012 Groundwater Sample
Laboratory Summary Data Package

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

May 23, 2012

Project: 11-1027.B

Submittal Date: 05/11/2012
Group Number: 1308454
SDG: TBF91
PO Number: 11-1027.B
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LLI) #
MW-6 (11.5) Filtered Grab Water	6649708
MW-6 (17.0) Filtered Grab Water	6649709
MW-7 (12.5) Filtered Grab Water	6649710
MW-7 (27.0) Filtered Grab Water	6649711
MW-8 (9.5) Filtered Grab Water	6649712
MW-8 (23.0) Filtered Grab Water	6649713
MW-9 (9.5) Filtered Grab Water	6649714
MW-9 (25.5) Filtered Grab Water	6649715
MW-9 (25.5)MS Filtered Grab Water	6649716
MW-9 (25.5)SD Filtered Grab Water	6649717
MW-9 (25.5)DUP Filtered Grab Water	6649718
DEEP WELL (12.0) Filtered Grab Water	6649719
DEEP WELL (35.0) Filtered Grab Water	6649720

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI
1 COPY TO Data Package Group

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW6 (11.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649708
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 15:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F611 SDG#: TBF91-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved	**SW846 6010B**		**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	1.14	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:25	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW6 (17.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649709
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 14:55 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F617 SDG#: TBF91-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	1.16	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:28	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW7 (12.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649710
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 14:10 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F712 SDG#: TBF91-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved	**SW846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.0815	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:39	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW7 (27.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649711
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 13:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F727 SDG#: TBF91-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	0.103 J	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.0180	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	10.2	0.0705	1
07051	Chromium	7440-47-3	0.0576	0.0011	1
07052	Cobalt	7440-48-4	0.0012 J	0.00062	1
07053	Copper	7440-50-8	0.0239	0.00094	1
01754	Iron	7439-89-6	0.0210 J	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	1.60	0.0067	1
07058	Manganese	7439-96-5	0.0085	0.00044	1
07061	Nickel	7440-02-0	0.135	0.00095	1
01762	Potassium	7440-09-7	3.23	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	9.03	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	N.D.	0.00096	1
07072	Zinc	7440-66-6	0.0894	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:43	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:43		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07052	Cobalt	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:43		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:43		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:43		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW-7 (27.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649711
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 13:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F727 SDG#: TBF91-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:43	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
07061	Nickel	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 20:14		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:43		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:06		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW8 (9.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649712
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 12:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F809 SDG#: TBF91-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved	**SW846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.0205	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:46	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: MW8 (23.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649713
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 11:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F823 SDG#: TBF91-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	0.0059 J	0.0051	1
07046	Barium	7440-39-3	0.0485	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	20.1	0.0705	1
07051	Chromium	7440-47-3	0.0237	0.0011	1
07052	Cobalt	7440-48-4	0.00074 J	0.00062	1
07053	Copper	7440-50-8	0.0051 J	0.00094	1
01754	Iron	7439-89-6	N.D.	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	2.54	0.0067	1
07058	Manganese	7439-96-5	0.0065	0.00044	1
07061	Nickel	7440-02-0	0.0033 J	0.00095	1
01762	Potassium	7440-09-7	2.40	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	14.4	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0014 J	0.00096	1
07072	Zinc	7440-66-6	0.0105 J	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:50	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:50		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07052	Cobalt	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:50		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:50		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:50		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW8 (23.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649713
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 11:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F823 SDG#: TBF91-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:50	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
07061	Nickel	SW-846 6010B	1	121351848009	05/22/2012 20:17		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 20:17		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:50		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:08		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (9.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649714
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 10:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F909 SDG#: TBF91-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved	**SW846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:53	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: MW9 (25.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649715
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.0714	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	24.2	0.0705	1
07051	Chromium	7440-47-3	N.D.	0.0011	1
07052	Cobalt	7440-48-4	0.00083 J	0.00062	1
07053	Copper	7440-50-8	0.0053 J	0.00094	1
01754	Iron	7439-89-6	N.D.	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	3.24	0.0067	1
07058	Manganese	7439-96-5	0.0057	0.00044	1
07061	Nickel	7440-02-0	0.0298	0.00095	1
01762	Potassium	7440-09-7	9.23	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	11.6	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0029 J	0.00096	1
07072	Zinc	7440-66-6	0.0252	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:03	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:03		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07052	Cobalt	SW846 6010B	1	121351848009	05/22/2012 19:51		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:03		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:03		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:03		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) Filtered Grab Water
11-1027.B

LLI Sample # WW6649715
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08BKG

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:03	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
07061	Nickel	SW-846 6010B	1	121351848009	05/22/2012 19:51		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 19:51		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:03		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:09		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5)MS Filtered Grab Water
11-1027.B

LLI Sample # WW6649716
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	2.04	0.0801	1
07044	Antimony	7440-36-0	0.490	0.0058	1
07035	Arsenic	7440-38-2	0.155	0.0051	1
07046	Barium	7440-39-3	2.10	0.00026	1
07047	Beryllium	7440-41-7	0.0503	0.00024	1
07049	Cadmium	7440-43-9	0.0503	0.00027	1
01750	Calcium	7440-70-2	27.9	0.0705	1
07051	Chromium	7440-47-3	0.200	0.0011	1
07052	Cobalt	7440-48-4	0.522	0.00062	1
07053	Copper	7440-50-8	0.253	0.00094	1
01754	Iron	7439-89-6	0.981	0.0141	1
07055	Lead	7439-92-1	0.157	0.0022	1
01757	Magnesium	7439-95-4	5.13	0.0067	1
07058	Manganese	7439-96-5	0.509	0.00044	1
07061	Nickel	7440-02-0	0.554	0.00095	1
01762	Potassium	7440-09-7	18.9	0.0874	1
07036	Selenium	7782-49-2	0.152	0.0069	1
07066	Silver	7440-22-4	0.0519	0.00091	1
01767	Sodium	7440-23-5	21.2	0.0647	1
07022	Thallium	7440-28-0	0.152	0.0042	1
07071	Vanadium	7440-62-2	0.513	0.00096	1
07072	Zinc	7440-66-6	0.527	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	0.00099	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:14	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:14		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07052	Cobalt	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:14		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:14		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:14		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5)MS Filtered Grab Water
11-1027.B

LLI Sample # WW6649716
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08MS

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:14	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
07061	Nickel	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 20:02		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:14		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:11		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

Sample Description: MW9 (25.5) SD Filtered Grab Water
11-1027.B

LLI Sample # WW6649717
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	2.07	0.0801	1
07044	Antimony	7440-36-0	0.492	0.0058	1
07035	Arsenic	7440-38-2	0.159	0.0051	1
07046	Barium	7440-39-3	2.11	0.00026	1
07047	Beryllium	7440-41-7	0.0504	0.00024	1
07049	Cadmium	7440-43-9	0.0502	0.00027	1
01750	Calcium	7440-70-2	27.7	0.0705	1
07051	Chromium	7440-47-3	0.200	0.0011	1
07052	Cobalt	7440-48-4	0.519	0.00062	1
07053	Copper	7440-50-8	0.253	0.00094	1
01754	Iron	7439-89-6	0.996	0.0141	1
07055	Lead	7439-92-1	0.159	0.0022	1
01757	Magnesium	7439-95-4	5.12	0.0067	1
07058	Manganese	7439-96-5	0.510	0.00044	1
07061	Nickel	7440-02-0	0.552	0.00095	1
01762	Potassium	7440-09-7	18.8	0.0874	1
07036	Selenium	7782-49-2	0.152	0.0069	1
07066	Silver	7440-22-4	0.0534	0.00091	1
01767	Sodium	7440-23-5	21.1	0.0647	1
07022	Thallium	7440-28-0	0.155	0.0042	1
07071	Vanadium	7440-62-2	0.514	0.00096	1
07072	Zinc	7440-66-6	0.525	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	0.0010	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:17	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:17		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07052	Cobalt	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:17		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:17		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:17		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) SD Filtered Grab Water
11-1027.B

LLI Sample # WW6649717
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:17	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
07061	Nickel	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 20:06		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:17		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:13		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

Sample Description: MW9 (25.5) DUP Filtered Grab Water
11-1027.B

LLI Sample # WW6649718
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08DUP

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	0.0061 J	0.0051	1
07046	Barium	7440-39-3	0.0722	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	24.6	0.0705	1
07051	Chromium	7440-47-3	N.D.	0.0011	1
07052	Cobalt	7440-48-4	0.00074 J	0.00062	1
07053	Copper	7440-50-8	0.0043 J	0.00094	1
01754	Iron	7439-89-6	0.0192 J	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	3.28	0.0067	1
07058	Manganese	7439-96-5	0.0056	0.00044	1
07061	Nickel	7440-02-0	0.0305	0.00095	1
01762	Potassium	7440-09-7	9.43	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	11.8	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0027 J	0.00096	1
07072	Zinc	7440-66-6	0.0252	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 07:10	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 07:10		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07052	Cobalt	SW846 6010B	1	121351848009	05/22/2012 19:58		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 07:10		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 07:10		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 07:10		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) DUP Filtered Grab Water
11-1027.B

LLI Sample # WW6649718
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7F925 SDG#: TBF91-08DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 07:10	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
07061	Nickel	SW-846 6010B	1	121351848009	05/22/2012 19:58		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 19:58		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 07:10		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:10		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: DEEP WELL (12.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649719
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 17:05 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7FD12 SDG#: TBF91-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved	**SW846 6010B**		**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 07:57	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848009	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: DEEP WELL (35.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649720
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 16:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7FD35 SDG#: TBF91-10*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.158	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	26.0	0.0705	1
07051	Chromium	7440-47-3	N.D.	0.0011	1
07052	Cobalt	7440-48-4	0.0089	0.00062	1
07053	Copper	7440-50-8	0.0081 J	0.00094	1
01754	Iron	7439-89-6	1.95	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	2.91	0.0067	1
07058	Manganese	7439-96-5	0.121	0.00044	1
07061	Nickel	7440-02-0	0.0014 J	0.00095	1
01762	Potassium	7440-09-7	4.68	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	26.3	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	N.D.	0.00096	1
07072	Zinc	7440-66-6	0.0337	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848009	05/20/2012 08:01	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07035	Arsenic	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07046	Barium	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07047	Beryllium	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07049	Cadmium	SW846 6010B	1	121351848009	05/20/2012 08:01		1
01750	Calcium	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07051	Chromium	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07052	Cobalt	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07053	Copper	SW846 6010B	1	121351848009	05/20/2012 08:01		1
01754	Iron	SW846 6010B	1	121351848009	05/20/2012 08:01		1
07055	Lead	SW846 6010B	1	121351848009	05/20/2012 08:01		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: DEEP WELL (35.0) Filtered Grab Water
11-1027.B

LLI Sample # WW6649720
LLI Group # 1308454
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 16:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/23/2012 11:22

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7FD35 SDG#: TBF91-10*

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010B	1	121351848009	05/20/2012 08:01	Ex. 4 CBI	1
07058	Manganese	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
07061	Nickel	SW-846 6010B	1	121351848009	05/22/2012 20:29		1
01762	Potassium	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
07036	Selenium	SW-846 6010B	1	121351848009	05/22/2012 20:29		1
07066	Silver	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
01767	Sodium	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
07022	Thallium	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
07071	Vanadium	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
07072	Zinc	SW-846 6010B	1	121351848009	05/20/2012 08:01		1
00259	Mercury	SW-846 7470A	1	121365713004	05/16/2012 10:14		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848009	05/14/2012 23:00		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121365713004	05/15/2012 15:06		1

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 05/23/12 at 11:22 AM

Group Number: 1308454

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 121351848009	Sample number(s): 6649708-6649720							
Aluminum	0.0821 J	0.0801	mg/l	102		90-112		
Antimony	N.D.	0.0058	mg/l	99		88-111		
Arsenic	N.D.	0.0051	mg/l	101		80-120		
Barium	N.D.	0.00026	mg/l	102		90-110		
Beryllium	N.D.	0.00024	mg/l	99		88-110		
Cadmium	N.D.	0.00027	mg/l	102		90-112		
Calcium	N.D.	0.0705	mg/l	97		90-110		
Chromium	N.D.	0.0011	mg/l	99		90-110		
Cobalt	N.D.	0.00062	mg/l	105		90-110		
Copper	0.0039 J	0.00094	mg/l	102		90-112		
Iron	N.D.	0.0141	mg/l	97		90-112		
Lead	N.D.	0.0022	mg/l	107		88-110		
Magnesium	N.D.	0.0067	mg/l	97		90-110		
Manganese	0.00054 J	0.00044	mg/l	101		90-110		
Nickel	N.D.	0.00095	mg/l	105		90-111		
Potassium	N.D.	0.0874	mg/l	90		85-115		
Selenium	N.D.	0.0069	mg/l	98		80-120		
Silver	N.D.	0.00091	mg/l	106		80-120		
Sodium	N.D.	0.0647	mg/l	93		87-114		
Thallium	N.D.	0.0042	mg/l	108		85-113		
Vanadium	N.D.	0.00096	mg/l	101		90-110		
Zinc	N.D.	0.0032	mg/l	100		90-110		
Batch number: 121365713004	Sample number(s): 6649711, 6649713, 6649715-6649718, 6649720							
Mercury	N.D.	0.00002 6	mg/l	103		80-120		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 121351848009	Sample number(s): 6649708-6649720 UNSPK: 6649715 BKG: 6649715								
Aluminum	102	103	75-125	1	20	N.D.	N.D.	0 (1)	20
Antimony	98	98	87-122	0	20	N.D.	N.D.	0 (1)	20
Arsenic	103	106	81-123	3	20	N.D.	0.0061 J	200* (1)	20
Barium	101	102	78-118	1	20	0.0714	0.0722	1	20
Beryllium	101	101	87-114	0	20	N.D.	N.D.	0 (1)	20
Cadmium	101	100	83-116	0	20	N.D.	N.D.	0 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1308454
Reported: 05/23/12 at 11:22 AM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Calcium	93 (2)	88 (2)	81-118	1	20	24.2	24.6	2	20
Chromium	100	100	81-120	0	20	N.D.	N.D.	0 (1)	20
Cobalt	104	104	87-112	1	20	0.00083 J	0.00074 J	11 (1)	20
Copper	99	99	86-122	0	20	0.0053 J	0.0043 J	20 (1)	20
Iron	98	100	75-125	1	20	N.D.	0.0192 J	200* (1)	20
Lead	105	106	75-125	2	20	N.D.	N.D.	0 (1)	20
Magnesium	95	94	75-125	0	20	3.24	3.28	1	20
Manganese	101	101	75-125	0	20	0.0057	0.0056	2 (1)	20
Nickel	105	105	86-115	0	20	0.0298	0.0305	2 (1)	20
Potassium	96	95	83-123	0	20	9.23	9.43	2	20
Selenium	101	101	75-125	0	20	N.D.	N.D.	0 (1)	20
Silver	104	107	75-125	3	20	N.D.	N.D.	0 (1)	20
Sodium	97	96	75-125	1	20	11.6	11.8	2	20
Thallium	101	104	83-116	2	20	N.D.	N.D.	0 (1)	20
Vanadium	102	102	90-111	0	20	0.0029 J	0.0027 J	6 (1)	20
Zinc	100	100	85-117	0	20	0.0252	0.0252	0 (1)	20

Batch number: 121365713004 Sample number(s): 6649711, 6649713, 6649715-6649718, 6649720 UNSPK: 6649715 BKG: 6649715

Mercury	99	102	80-120	3	20	N.D.	N.D.	0 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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For Lancaster Laboratories use only

Acct. # 10855 Group # 1308454 Sample # 6649708-20

COC # 305683

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: TEN BEARS ENVIRONMENTAL Acct. #: 10855

Project Name/#: 11-1027.B PWSID #:

Project Mana[illegible] P.O.#:

Sampler: [illegible] Quote #:

Name of state where samples were collected: DE

Ex. 4 CBI

For Lab Use Only
FSC:
SCR#: 121838

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (Potable / NPDES / Ground / Surface)	Other:	Total # of Containers	Total Total Metals	Dissolved Total Metals *	Cyanide	Total Chromium	Dissolved Chromium *					Remarks
MW-6 (11.5)	5/9/2012	1530	X			X		2				X	X					* SAMPLES COLLECTED FOR
MW-6 (17.0)	5/9/2012	1455	X			X		2				X	X					DISSOLVED CONCENTRATION
MW-7 (12.5)	5/9/2012	1410	X			X		2				X	X					WERE FIELD-FILTERED AND
MW-7 (27.0) + BATCH QC	5/9/2012	1330	X			X		4	X	X	X							ARE INDICATED BY SUCH
MW-8 (9.5)	5/9/2012	1220	X			X		2				X	X					ON THE SAMPLE LABEL
MW-8 (23.0)	5/9/2012	1135	X			X		3	X	X	X							
MW-9 (9.5)	5/9/2012	1035	X			X		2				X	X					
MW-9 (25.5) + QA/QC + BATCH QC	5/9/2012	0945	X			X		7	X	X	X							← QA/QC ALONE
DEEP WELL (12.0)	5/9/2012	1705	X			X		2				X	X					
DEEP WELL (35.0)	5/9/2012	1620	X			X		3	X	X	X							

(7) **Turnaround Time Requested** (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #: 302 731 8633
E-mail address: TENBEARS ER@COMCAST.NET

(8) **Data Package Options** (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(if yes, indicate QC sample and submit triplicate sample volume)

Ex. 4 CBI

Ex. 4 CBI

Relinquished by:	Date	Time	Received by:	Date	Time
	5/10/12	1545		5/10/12	1200
	5/9/2012	1110		5/12	1110
	5/12	1610			
				5/10/12	1600

(9)

DE HSCA DATA PACKAGE

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management
7044.01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

May 24, 2012

Project: 11-1027.B

Submittal Date: 05/11/2012
Group Number: 1308453
SDG: TBF90
PO Number: 11-1027.B
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LLI) #
MW-6 (11.5) Grab Water	6649695
MW-6 (17.0) Grab Water	6649696
MW-7 (12.5) Grab Water	6649697
MW-7 (27.0) Grab Water	6649698
MW-8 (9.5) Grab Water	6649699
MW-8 (23.0) Grab Water	6649700
MW-9 (9.5) Grab Water	6649701
MW-9 (25.5) Grab Water	6649702
MW-9 (25.5)MS Grab Water	6649703
MW-9 (25.5)SD Grab Water	6649704
MW-9 (25.5)DUP Grab Water	6649705
DEEP WELL (12.0) Grab Water	6649706
DEEP WELL (35.0) Grab Water	6649707

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO	Ten Bears Environmental, LLC	Attn: Ex. 4 CBI
1 COPY TO	Data Package Group	

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Analysis Report

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Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW6 (11.5) Grab Water
11-1027.B

LLI Sample # WW6649695
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 15:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B611 SDG#: TBF90-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	1.17	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:09	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

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Sample Description: MW6 (17.0) Grab Water
11-1027.B

LLI Sample # WW6649696
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 14:55 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B617 SDG#: TBF90-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	1.17	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:12	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW7 (12.5) Grab Water
11-1027.B

LLI Sample # WW6649697
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 14:10 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B712 SDG#: TBF90-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.0785	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:23	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW7 (27.0) Grab Water
11-1027.B

LLI Sample # WW6649698
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 13:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B727 SDG#: TBF90-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	0.163 J	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.0192	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	10.7	0.0705	1
07051	Chromium	7440-47-3	0.0650	0.0011	1
07052	Cobalt	7440-48-4	0.00083 J	0.00062	1
07053	Copper	7440-50-8	0.0273	0.00094	1
01754	Iron	7439-89-6	0.116 J	0.0141	1
07055	Lead	7439-92-1	0.0022 J	0.0022	1
01757	Magnesium	7439-95-4	1.65	0.0067	1
07058	Manganese	7439-96-5	0.0092	0.00044	1
07061	Nickel	7440-02-0	0.144	0.00095	1
01762	Potassium	7440-09-7	3.45	0.0874	1
07036	Selenium	7782-49-2	N.D.	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	9.32	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0014 J	0.00096	1
07072	Zinc	7440-66-6	0.0887	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/23/2012 01:04	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 11:27		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 11:27		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW7 (27.0) Grab Water
11-1027.B

LLI Sample # WW6649698
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 13:30 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B727 SDG#: TBF90-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 11:27	Ex. 4 CBI	1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07061	Nickel	SW846 6010B	1	121351848008	05/21/2012 11:27		1
01762	Potassium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07036	Selenium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07066	Silver	SW846 6010B	1	121351848008	05/21/2012 11:27		1
01767	Sodium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07022	Thallium	SW846 6010B	1	121351848008	05/23/2012 01:04		1
07071	Vanadium	SW846 6010B	1	121351848008	05/21/2012 11:27		1
07072	Zinc	SW846 6010B	1	121441848002	05/24/2012 08:23		1
00259	Mercury	SW846 7470A	1	121355713005	05/16/2012 11:28		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW846 9012A	1	12136117101A	05/16/2012 08:47		1
08256	Cyanide Water Distillation	SW846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

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Sample Description: MW8 (9.5) Grab Water
11-1027.B

LLI Sample # WW6649699
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 12:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B809 SDG#: TBF90-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0207	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:30	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

Sample Description: MW8 (23.0) Grab Water
11-1027.B

LLI Sample # WW6649700
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 11:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B823 SDG#: TBF90-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.0495	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	20.5	0.0705	1
07051	Chromium	7440-47-3	0.0248	0.0011	1
07052	Cobalt	7440-48-4	0.00070 J	0.00062	1
07053	Copper	7440-50-8	0.0054 J	0.00094	1
01754	Iron	7439-89-6	0.0237 J	0.0141	1
07055	Lead	7439-92-1	0.0026 J	0.0022	1
01757	Magnesium	7439-95-4	2.60	0.0067	1
07058	Manganese	7439-96-5	0.0067	0.00044	1
07061	Nickel	7440-02-0	0.0043 J	0.00095	1
01762	Potassium	7440-09-7	2.48	0.0874	1
07036	Selenium	7782-49-2	0.0114 J	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	14.6	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0014 J	0.00096	1
07072	Zinc	7440-66-6	0.0108 J	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/23/2012 01:08	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 11:34		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 11:34		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW8 (23.0) Grab Water
11-1027.B

LLI Sample # WW6649700
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 11:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B823 SDG#: TBF90-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 11:34	Ex. 4 CBI	1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07061	Nickel	SW846 6010B	1	121351848008	05/23/2012 01:08		1
01762	Potassium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07036	Selenium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07066	Silver	SW846 6010B	1	121351848008	05/21/2012 11:34		1
01767	Sodium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07022	Thallium	SW846 6010B	1	121351848008	05/23/2012 01:08		1
07071	Vanadium	SW846 6010B	1	121351848008	05/21/2012 11:34		1
07072	Zinc	SW846 6010B	1	121441848002	05/24/2012 08:27		1
00259	Mercury	SW846 7470A	1	121355713005	05/16/2012 11:30		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW846 9012A	1	12136117101A	05/16/2012 08:48		1
08256	Cyanide Water Distillation	SW846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (9.5) Grab Water
11-1027.B

LLI Sample # WW6649701
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 10:35 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B909 SDG#: TBF90-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:38	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) Grab Water
11-1027.B

LLI Sample # WW6649702
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	0.135 J	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	0.0096 J	0.0051	1
07046	Barium	7440-39-3	0.0712	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	24.3	0.0705	1
07051	Chromium	7440-47-3	N.D.	0.0011	1
07052	Cobalt	7440-48-4	0.00079 J	0.00062	1
07053	Copper	7440-50-8	0.0052 J	0.00094	1
01754	Iron	7439-89-6	0.0794 J	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	3.27	0.0067	1
07058	Manganese	7439-96-5	0.0057	0.00044	1
07061	Nickel	7440-02-0	0.0309	0.00095	1
01762	Potassium	7440-09-7	9.38	0.0874	1
07036	Selenium	7782-49-2	0.0157 J	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	11.5	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0031 J	0.00096	1
07072	Zinc	7440-66-6	0.0245	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/23/2012 00:42	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 10:47		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 10:47		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) Grab Water
11-1027.B

LLI Sample # WW6649702
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08BKG

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 10:47	Ex. 4 CBI	1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07061	Nickel	SW846 6010B	1	121351848008	05/23/2012 00:42		1
01762	Potassium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07036	Selenium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07066	Silver	SW846 6010B	1	121351848008	05/21/2012 10:47		1
01767	Sodium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07022	Thallium	SW846 6010B	1	121351848008	05/23/2012 00:42		1
07071	Vanadium	SW846 6010B	1	121351848008	05/21/2012 10:47		1
07072	Zinc	SW846 6010B	1	121441848002	05/24/2012 07:56		1
00259	Mercury	SW846 7470A	1	121355713005	05/16/2012 11:31		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW846 9012A	1	12136117101A	05/16/2012 08:52		1
08256	Cyanide Water Distillation	SW846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5)MS Grab Water
11-1027.B

LLI Sample # WW6649703
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	2.40	0.0801	1
07044	Antimony	7440-36-0	0.509	0.0058	1
07035	Arsenic	7440-38-2	0.157	0.0051	1
07046	Barium	7440-39-3	2.07	0.00026	1
07047	Beryllium	7440-41-7	0.0499	0.00024	1
07049	Cadmium	7440-43-9	0.0507	0.00027	1
01750	Calcium	7440-70-2	28.4	0.0705	1
07051	Chromium	7440-47-3	0.201	0.0011	1
07052	Cobalt	7440-48-4	0.528	0.00062	1
07053	Copper	7440-50-8	0.251	0.00094	1
01754	Iron	7439-89-6	1.12	0.0141	1
07055	Lead	7439-92-1	0.162	0.0022	1
01757	Magnesium	7439-95-4	5.25	0.0067	1
07058	Manganese	7439-96-5	0.506	0.00044	1
07061	Nickel	7440-02-0	0.559	0.00095	1
01762	Potassium	7440-09-7	19.4	0.0874	1
07036	Selenium	7782-49-2	0.167	0.0069	1
07066	Silver	7440-22-4	0.0521	0.00091	1
01767	Sodium	7440-23-5	21.3	0.0647	1
07022	Thallium	7440-28-0	0.128	0.0042	1
07071	Vanadium	7440-62-2	0.518	0.00096	1
07072	Zinc	7440-66-6	0.518	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	0.0010	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	0.20	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/21/2012 10:58	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 10:58		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 10:58		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5)MS Grab Water
11-1027.B

LLI Sample # WW6649703
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08MS

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 10:58	Ex. 4 CBI	1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07061	Nickel	SW846 6010B	1	121351848008	05/21/2012 10:58		1
01762	Potassium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07036	Selenium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07066	Silver	SW846 6010B	1	121351848008	05/21/2012 10:58		1
01767	Sodium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07022	Thallium	SW846 6010B	1	121351848008	05/23/2012 00:53		1
07071	Vanadium	SW846 6010B	1	121351848008	05/21/2012 10:58		1
07072	Zinc	SW846 6010B	2	121441848002	05/24/2012 08:09		1
00259	Mercury	SW846 7470A	1	121355713005	05/16/2012 11:34		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW846 9012A	1	12136117101A	05/16/2012 08:53		1
08256	Cyanide Water Distillation	SW846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) SD Grab Water
11-1027.B

LLI Sample # WW6649704
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	2.37	0.0801	1
07044	Antimony	7440-36-0	0.502	0.0058	1
07035	Arsenic	7440-38-2	0.158	0.0051	1
07046	Barium	7440-39-3	2.08	0.00026	1
07047	Beryllium	7440-41-7	0.0499	0.00024	1
07049	Cadmium	7440-43-9	0.0505	0.00027	1
01750	Calcium	7440-70-2	28.3	0.0705	1
07051	Chromium	7440-47-3	0.201	0.0011	1
07052	Cobalt	7440-48-4	0.525	0.00062	1
07053	Copper	7440-50-8	0.253	0.00094	1
01754	Iron	7439-89-6	1.08	0.0141	1
07055	Lead	7439-92-1	0.161	0.0022	1
01757	Magnesium	7439-95-4	5.24	0.0067	1
07058	Manganese	7439-96-5	0.508	0.00044	1
07061	Nickel	7440-02-0	0.556	0.00095	1
01762	Potassium	7440-09-7	19.4	0.0874	1
07036	Selenium	7782-49-2	0.166	0.0069	1
07066	Silver	7440-22-4	0.0522	0.00091	1
01767	Sodium	7440-23-5	21.3	0.0647	1
07022	Thallium	7440-28-0	0.128	0.0042	1
07071	Vanadium	7440-62-2	0.520	0.00096	1
07072	Zinc	7440-66-6	0.514	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	0.00098	0.000026	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/21/2012 11:02	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 11:02		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 11:02		1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 11:02		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 11:02		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) SD Grab Water
11-1027.B

LLI Sample # WW6649704
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07061	Nickel	SW-846 6010B	1	121351848008	05/21/2012 11:02	Ex. 4 CBI	1
01762	Potassium	SW-846 6010B	1	121351848008	05/21/2012 11:02		1
07036	Selenium	SW-846 6010B	1	121351848008	05/21/2012 11:02		1
07066	Silver	SW-846 6010B	1	121351848008	05/21/2012 11:02		1
01767	Sodium	SW-846 6010B	1	121351848008	05/21/2012 11:02		1
07022	Thallium	SW-846 6010B	1	121351848008	05/23/2012 00:57		1
07071	Vanadium	SW-846 6010B	1	121351848008	05/21/2012 11:02		1
07072	Zinc	SW-846 6010B	2	121441848002	05/24/2012 08:14		1
00259	Mercury	SW-846 7470A	1	121355713005	05/16/2012 11:35		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	121355713005	05/14/2012 15:17		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) DUP Grab Water
11-1027.B

LLI Sample # WW6649705
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08DUP

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	0.138 J	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	0.0065 J	0.0051	1
07046	Barium	7440-39-3	0.0709	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	24.2	0.0705	1
07051	Chromium	7440-47-3	N.D.	0.0011	1
07052	Cobalt	7440-48-4	0.0011 J	0.00062	1
07053	Copper	7440-50-8	0.0046 J	0.00094	1
01754	Iron	7439-89-6	0.0736 J	0.0141	1
07055	Lead	7439-92-1	N.D.	0.0022	1
01757	Magnesium	7439-95-4	3.26	0.0067	1
07058	Manganese	7439-96-5	0.0056	0.00044	1
07061	Nickel	7440-02-0	0.0313	0.00095	1
01762	Potassium	7440-09-7	9.41	0.0874	1
07036	Selenium	7782-49-2	0.0115 J	0.0069	1
07066	Silver	7440-22-4	N.D.	0.00091	1
01767	Sodium	7440-23-5	11.5	0.0647	1
07022	Thallium	7440-28-0	N.D.	0.0042	1
07071	Vanadium	7440-62-2	0.0029 J	0.00096	1
07072	Zinc	7440-66-6	0.0244	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	N.D.	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	0.0057 J	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/23/2012 00:49	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 10:54		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 10:54		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: MW9 (25.5) DUP Grab Water
11-1027.B

LLI Sample # WW6649705
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 09:45 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

7B925 SDG#: TBF90-08DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW846 6010B	1	121351848008	05/21/2012 10:54	Ex. 4 CBI	1
01757	Magnesium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07058	Manganese	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07061	Nickel	SW846 6010B	1	121351848008	05/23/2012 00:49		1
01762	Potassium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07036	Selenium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07066	Silver	SW846 6010B	1	121351848008	05/21/2012 10:54		1
01767	Sodium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07022	Thallium	SW846 6010B	1	121351848008	05/23/2012 00:49		1
07071	Vanadium	SW846 6010B	1	121351848008	05/21/2012 10:54		1
07072	Zinc	SW846 6010B	1	121441848002	05/24/2012 08:05		1
00259	Mercury	SW846 7470A	1	121355713005	05/16/2012 11:33		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW846 9012A	1	12136117101A	05/16/2012 08:54		1
08256	Cyanide Water Distillation	SW846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Sample Description: DEEP WELL (12.0) Grab Water
11-1027.B

LLI Sample # WW6649706
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 17:05 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

DWL12 SDG#: TBF90-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0059 J	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:41	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	121351848008	05/14/2012 23:00		1

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Analysis Report

Sample Description: DEEP WELL (35.0) Grab Water
11-1027.B

LLI Sample # WW6649707
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 16:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

DWL35 SDG#: TBF90-10*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
01743	Aluminum	7429-90-5	N.D.	0.0801	1
07044	Antimony	7440-36-0	N.D.	0.0058	1
07035	Arsenic	7440-38-2	N.D.	0.0051	1
07046	Barium	7440-39-3	0.162	0.00026	1
07047	Beryllium	7440-41-7	N.D.	0.00024	1
07049	Cadmium	7440-43-9	N.D.	0.00027	1
01750	Calcium	7440-70-2	26.9	0.0705	1
07051	Chromium	7440-47-3	0.0074 J	0.0011	1
07052	Cobalt	7440-48-4	0.0118	0.00062	1
07053	Copper	7440-50-8	0.0570	0.00094	1
01754	Iron	7439-89-6	17.4	0.0141	1
07055	Lead	7439-92-1	0.0447	0.0022	1
01757	Magnesium	7439-95-4	3.01	0.0067	1
07058	Manganese	7439-96-5	0.176	0.00044	1
07061	Nickel	7440-02-0	0.0090 J	0.00095	1
01762	Potassium	7440-09-7	4.90	0.0874	1
07036	Selenium	7782-49-2	0.0173 J	0.0069	1
07066	Silver	7440-22-4	0.0014 J	0.00091	1
01767	Sodium	7440-23-5	26.7	0.0647	1
07022	Thallium	7440-28-0	0.0052 J	0.0042	1
07071	Vanadium	7440-62-2	0.0013 J	0.00096	1
07072	Zinc	7440-66-6	0.300	0.0032	1
		SW846 7470A	**mg/l**	**mg/l**	
00259	Mercury	7439-97-6	0.00037	0.000026	1
Wet Chemistry		**SW846 9012A**	**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01743	Aluminum	SW846 6010B	1	121351848008	05/21/2012 11:45	Ex. 4 CBI	1
07044	Antimony	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07035	Arsenic	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07046	Barium	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07047	Beryllium	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07049	Cadmium	SW846 6010B	1	121351848008	05/21/2012 11:45		1
01750	Calcium	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07051	Chromium	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07052	Cobalt	SW846 6010B	1	121351848008	05/21/2012 11:45		1
07053	Copper	SW846 6010B	1	121351848008	05/21/2012 11:45		1
01754	Iron	SW846 6010B	1	121351848008	05/21/2012 11:45		1

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Analysis Report

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Sample Description: DEEP WELL (35.0) Grab Water
11-1027.B

LLI Sample # WW6649707
LLI Group # 1308453
Account # 10855

Project Name: 11-1027.B

Collected: 05/09/2012 16:20 by KL

Submitted: 05/11/2012 16:40
Reported: 05/24/2012 10:55

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

DWL35 SDG#: TBF90-10*

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07055	Lead	SW-846 6010B	1	121351848008	05/21/2012 11:45	Ex. 4 CBI	1
01757	Magnesium	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07058	Manganese	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07061	Nickel	SW-846 6010B	1	121351848008	05/23/2012 01:20		1
01762	Potassium	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07036	Selenium	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07066	Silver	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
01767	Sodium	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07022	Thallium	SW-846 6010B	1	121351848008	05/23/2012 01:20		1
07071	Vanadium	SW-846 6010B	1	121351848008	05/21/2012 11:45		1
07072	Zinc	SW-846 6010B	1	121441848002	05/24/2012 08:40		1
00259	Mercury	SW-846 7470A	1	121355713005	05/16/2012 11:36		1
01848	WWSW846 ICP Digest (tot rec)	SW-846 3005A	1	121351848008	05/14/2012 23:00		1
01848	WWSW846 ICP Digest (tot rec)	SW-846 3005A	2	121441848002	05/23/2012 23:30		1
05713	WWSW846 Hg Digest	SW-846 7470A	1	121355713005	05/14/2012 15:17		1
08255	Total Cyanide (water)	SW-846 9012A	1	12136117101A	05/16/2012 08:55		1
08256	Cyanide Water Distillation	SW-846 9012A	1	12136117101A	05/15/2012 08:55		1

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 05/24/12 at 10:55 AM

Group Number: 1308453

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 121351848008	Sample number(s): 6649695-6649707							
Aluminum	0.0904 J	0.0801	mg/l	103		90-112		
Antimony	N.D.	0.0058	mg/l	103		88-111		
Arsenic	N.D.	0.0051	mg/l	100		80-120		
Barium	N.D.	0.00026	mg/l	103		90-110		
Beryllium	N.D.	0.00024	mg/l	101		88-110		
Cadmium	N.D.	0.00027	mg/l	104		90-112		
Calcium	N.D.	0.0705	mg/l	99		90-110		
Chromium	N.D.	0.0011	mg/l	102		90-110		
Cobalt	N.D.	0.00062	mg/l	107		90-110		
Copper	0.0041 J	0.00094	mg/l	102		90-112		
Iron	N.D.	0.0141	mg/l	97		90-112		
Lead	N.D.	0.0022	mg/l	108		88-110		
Magnesium	N.D.	0.0067	mg/l	98		90-110		
Manganese	0.00057 J	0.00044	mg/l	103		90-110		
Nickel	N.D.	0.00095	mg/l	107		90-111		
Potassium	N.D.	0.0874	mg/l	93		85-115		
Selenium	N.D.	0.0069	mg/l	100		80-120		
Silver	N.D.	0.00091	mg/l	107		80-120		
Sodium	N.D.	0.0647	mg/l	95		87-114		
Thallium	N.D.	0.0042	mg/l	86		85-113		
Vanadium	N.D.	0.00096	mg/l	104		90-110		
Batch number: 121355713005	Sample number(s): 6649698, 6649700, 6649702-6649705, 6649707							
Mercury	N.D.	0.00002 6	mg/l	96		80-120		
Batch number: 121441848002	Sample number(s): 6649698, 6649700, 6649702-6649705, 6649707							
Zinc	N.D.	0.0032	mg/l	99		90-110		
Batch number: 12136117101A	Sample number(s): 6649698, 6649700, 6649702-6649703, 6649705, 6649707							
Total Cyanide (water)	N.D.	0.0050	mg/l	105		90-110		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 121351848008	Sample number(s): 6649695-6649707 UNSPK: 6649702 BKG: 6649702								
Aluminum	113	112	75-125	1	20	0.135 J	0.138 J	2 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1308453
Reported: 05/24/12 at 10:55 AM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Antimony	102	100	87-122	1	20	N.D.	N.D.	0 (1)	20
Arsenic	98	99	81-123	1	20	0.0096 J	0.0065 J	38* (1)	20
Barium	100	100	78-118	0	20	0.0712	0.0709	0	20
Beryllium	100	100	87-114	0	20	N.D.	N.D.	0 (1)	20
Cadmium	101	101	83-116	0	20	N.D.	N.D.	0 (1)	20
Calcium	102 (2)	101 (2)	81-118	0	20	24.3	24.2	0	20
Chromium	100	101	81-120	0	20	N.D.	N.D.	0 (1)	20
Cobalt	106	105	87-112	1	20	0.00079 J	0.0011 J	34* (1)	20
Copper	98	99	86-122	1	20	0.0052 J	0.0046 J	13 (1)	20
Iron	104	100	75-125	3	20	0.0794 J	0.0736 J	8 (1)	20
Lead	108	108	75-125	0	20	N.D.	N.D.	0 (1)	20
Magnesium	99	98	75-125	0	20	3.27	3.26	0	20
Manganese	100	100	75-125	0	20	0.0057	0.0056	2 (1)	20
Nickel	106	105	86-115	1	20	0.0309	0.0313	1 (1)	20
Potassium	100	100	83-123	0	20	9.38	9.41	0	20
Selenium	101	100	75-125	1	20	0.0157 J	0.0115 J	31* (1)	20
Silver	104	104	75-125	0	20	N.D.	N.D.	0 (1)	20
Sodium	98	98	75-125	0	20	11.5	11.5	0	20
Thallium	85	85	83-116	0	20	N.D.	N.D.	0 (1)	20
Vanadium	103	103	90-111	0	20	0.0031 J	0.0029 J	6 (1)	20
Batch number: 121355713005	Sample number(s): 6649698, 6649700, 6649702-6649705, 6649707 UNSPK: 6649702 BKG: 6649702								
Mercury	104	98	80-120	6	20	N.D.	N.D.	0 (1)	20
Batch number: 121441848002	Sample number(s): 6649698, 6649700, 6649702-6649705, 6649707 UNSPK: 6649702 BKG: 6649702								
Zinc	99	98	85-117	1	20	0.0245	0.0244	0 (1)	20
Batch number: 12136117101A	Sample number(s): 6649698, 6649700, 6649702-6649703, 6649705, 6649707 UNSPK: 6649702 BKG: 6649702								
Total Cyanide (water)	101		43-137			N.D.	0.0057 J	200* (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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For Lancaster Laboratories use only

Acct. # 10855 Group # 1308453 Sample # 6649695-707 **COC # 305683**

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: TEN BEARS ENVIRONMENTAL Acct. #: 10855

Project Name/#: 11-1027,B PWSID #:

Project Mar[illegible] P.O.#:

Sampler: [illegible] Quote #:

Name of state where samples were collected: DE

Ex. 4 CBI

For Lab Use Only
FSC:
SCR#: 1211638

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(6) Temperature of samples upon receipt (if requested)

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix: Soil	Sediment	Water (Potable / NPDES / Ground / Surface)	Other:	(4) Total # of Containers	(5) Analyses Requested / Preservation Codes: Total Metals	Dissolved Metals*	Cyanide	Total Chromium	Dissolved Chromium*	Remarks
MW-6 (11.5)	5/9/2012	1530	X				X		2				X	X	*SAMPLES COLLECTED FOR
MW-6 (17.0)	5/9/2012	1455	X				X		2				X	X	DISSOLVED CONCENTRATIONS
MW-7 (12.5)	5/9/2012	1410	X				X		2				X	X	WERE FIELD-FILTERED AND
MW-7 (27.0) + BATCH QC	5/9/2012	1330	X				X		4	X	X	X			ARE INDICATED AS SUCH
MW-8 (9.5)	5/9/2012	1220	X				X		2				X	X	ON THE SAMPLE LABEL
MW-8 (23.0)	5/9/2012	1135	X				X		3	X	X	X			
MW-9 (9.5)	5/9/2012	1035	X				X		2				X	X	
MW-9 (25.5) + QA/QC + BATCH QC	5/9/2012	0945	X				X		7	X	X	X			← QA/QC HERE
DEEP WELL (12.0)	5/9/2012	1705	X				X		2				X	X	
DEEP WELL (35.0)	5/9/2012	1620	X				X		3	X	X	X			

(7) **Turnaround Time Requested** (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #: 302 731 8633
E-mail address: TENBEARSBR@COMCAST.NET

(8) **Data Package Options** (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(if yes, indicate QC sample and submit triplicate sample volume)

Ex. 4 CBI

Relinquished by:	Date	Time
	1/30/12	15:41
	5/9/2012	1110
	11/12/16	
Relinquished by:	Date	Time

Ex. 4 CBI

(9)

Date	Time
5/9/2012	1200
1/12	1110

DE HSCA DATA PACKAGE

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management 7044.01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX D

Phase II (2013) RI Information

D-1 Photographs
D-2 Phase II RI Monitor Well /Soil Boring Logs, Well Completion Reports
D-3 Phase II RI Wells - Groundwater Sample Collection Field Sheets
D-4 Groundwater Sample Laboratory Summary Data Package –May 2013

Appendix D-1
Phase II Photographs

Photo Log
May 6-8, 2013

Photo 1: View of Deep Well (I) Hollow Stem Augering 0-20 feet.

Photo 2: View of preparing to set the 6"-diameter PVC subsurface casing.

Photo Log
May 6-8, 2013

Photo 3: View of prying clayey soils from augers as they were retracted.

Photo 4: Same as above, different view.

Photo Log
May 6-8, 2013

Photo 5: View of containerizing of drilling cuttings from 0-20 feet. Note drums for containing development fluids and pre-sampling purge water.

Photo 6: View of hoisting 6-inch PVC surface casing for installations at DW-2.

Photo Log
May 6-8, 2013

Photo7: View of clay-encrusted augers during removal, DW-2.

Photo 8: Same as above, different view.

Photo Log
May 6-8, 2013

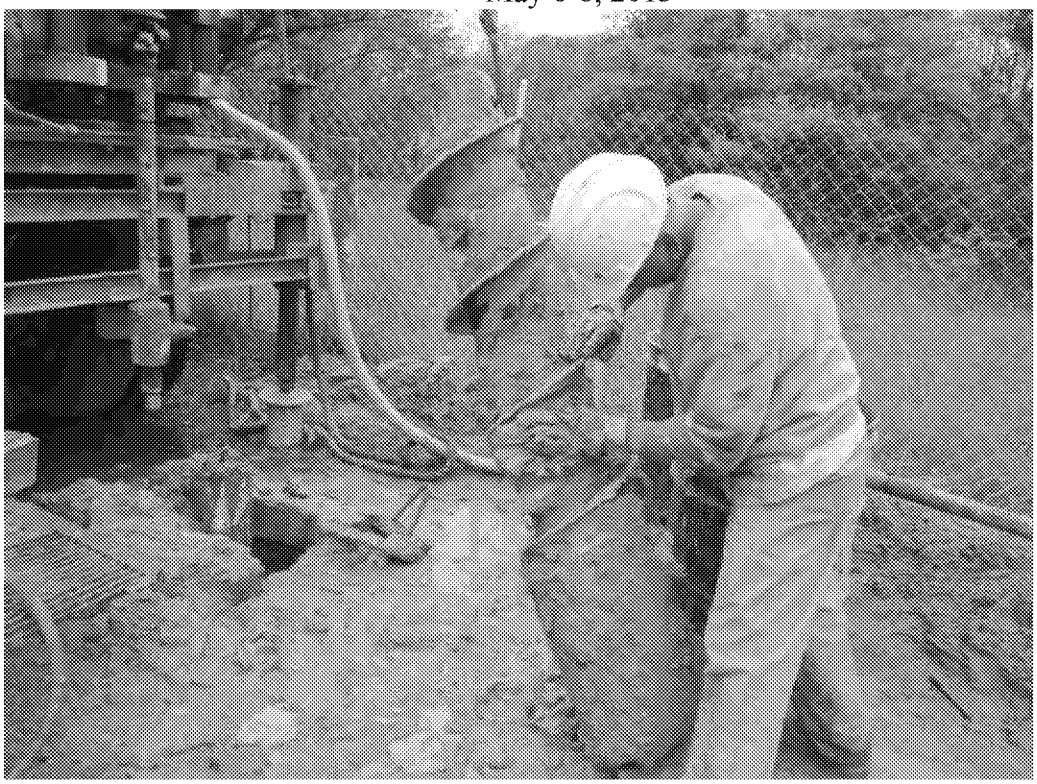

Photo 9: Same as photo 7, different view.

Photo 10: View of preparing bentonite slurry for mud rotary drilling (5-7-2013).

Photo Log
May 6-8, 2013

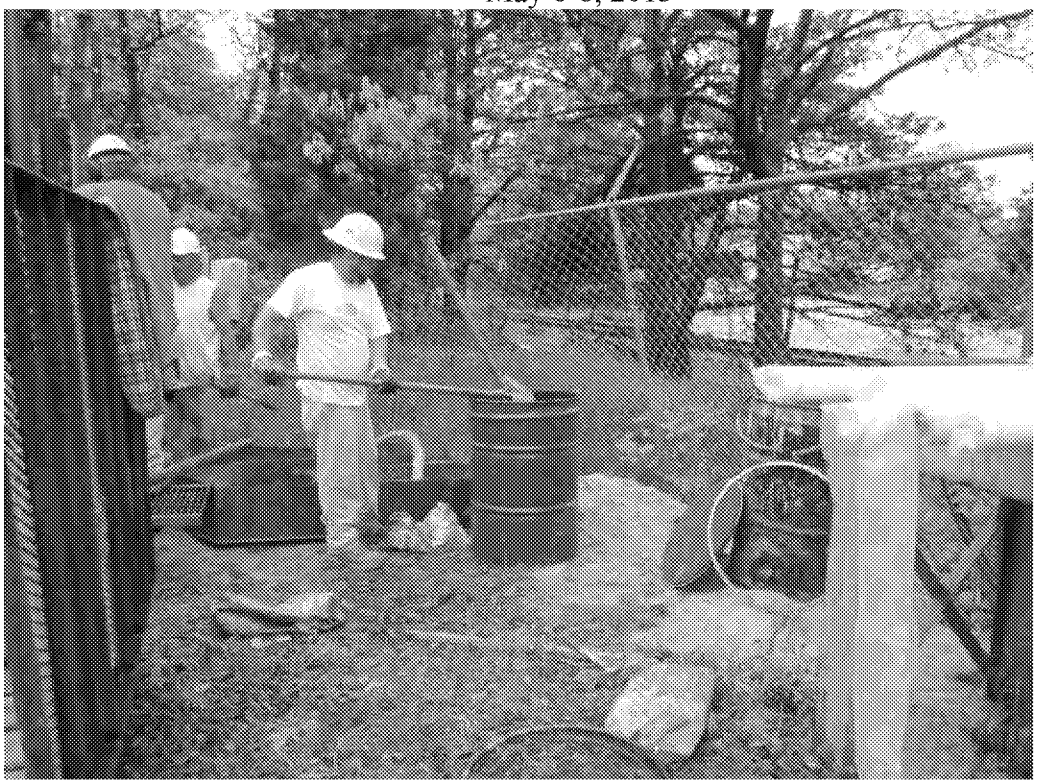

Photo 11: View of drumming drilling mud for staging (5-7-2013).

Photo 12: View of installed 2-inch diameter PVC well (5-7-2013).

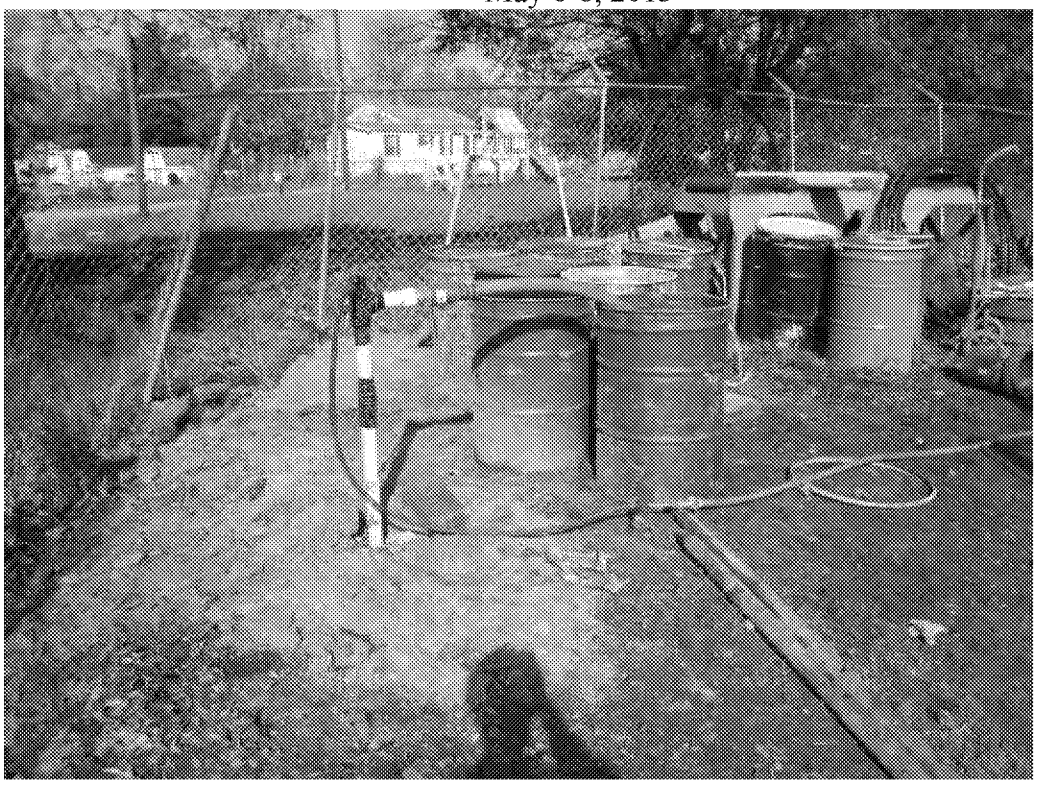

Photo 13: View of airlift development, pumping into drums (5-8-2013).

Photo 14: View of computed flush-to-grade DW-2 (5-8-2013).

Appendix D-2
Phase II RI Monitor Well /Soil Boring Logs, Well Completion Reports

Boring MW-10

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name Procino Plating Property	**Project Location** Seaford, Delaware		**Project Number** 11-1027.C
Drilling Agency Northeast Regional Probing	**Driller** Ex. 4 CBI	**Date Started:** 5/7/2013 **Date Finished:** 5/7/2013	
Drilling Equipment Track Mounted Geoprobe	**Drilling Procedures** 1.5-inch diameter, 4-foot long continuous dualcore sampler / 2-inch diameter discrete macrocore sampler		**Logged by:** BKE
Weather Cloudy, rain 50s	**Surface Conditions** Grass	**Surface Elevation** NA	**Datum** NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0		2.4	Dark brown to orange-brown fine to medium SAND, little silt	0.0
				4.0			
2	4	8			2.9	SAME, soil color transitions to tan at approximately 5.5 feet,	0.0
						wet at approximately 7.0 feet	
3	8	12		10.5	3.4	SAME,Tan fine-medium sand, little to trace coarse sand,	0.0
			10.5			little to trace gravel	
4	12	16				Acetate sleeve stuck in the macrocore sampler, cannot remove,	0.0
						no description	
5	16	22		16.8	3.5	Tan fine to coarse SAND, trace gravel, trace silt	0.0
			16.8	18.2		Tan fine to medium SAND, trace silt	0.0
			18.2	18.6		Orange, brown fine to medium SAND, little silt	0.0
			18.6			Light orange, brown fine to coarse SAND, trace gravel, trace	0.0
						silt	
6	22	28		22.5	4.0	Orange, brown fine to medium SAND, little silt	0.0
			22.5	27.5		Orange, gray CLAY	0.0
			27.5	...		Gray fine to medium SAND, some silt	0.0

Notes

1. The boring was terminated at a depth of approximately 28.0 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 7.0 feet below the existing ground surface.
3. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 4.0 to 24.0 feet below the ground surface. The annular space of the borehole was filled with No. 2 filter sand to a depth of approximately 2.0 feet below the ground surface. The remainder of the borehole was filled with granular bentonite. The well was finished with a concrete curbbox set in sakrete.
4. Discrete soil samples were collected from approximately 16.0 to 28.0 feet below the ground surface to ensure recovery.

Boring MW-11

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	5/7/2013
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	5/7/2013
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler / 2-inch diameter discrete macrocore sampler		BKE

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, rain 50s	Vegetation	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	2.0	2.0	Brown to tan, fine to medium SAND, little to trace silt	0.0
2	4	8			2.8	SAME	0.0
3	8	12			3.8	SAME, soil color transitions to light gray at approximately 11.5 feet	0.0
4	12	16		12.3	3.9	SAME	0.0
			12.3			Tan, light tan fine to coarse SAND, trace silt, soil color transitions to orange, brown at approximately 15.5 feet, and gravel from approximately 13.0 to 13.5 feet, some gravel below approximately 13.5 feet	0.0
5	16	20		16.3	4.0	SAME	0.0
			16.3	17.7		Orange, gray CLAY, trace silt	0.0
			17.7	18.8		Light brown fine to medium SAND, little coarse sand	0.0
			18.8			Orange, brown fine to medium SAND, little silt	0.0
6	20	26		20.3	2.5	Light tan fine to medium SAND, and some gravel, trace silt	0.0
			20.3	25.0		Light tan fine to coarse SAND, trace silt	0.0
			25.0	...		Orange, gray CLAY	0.0

Notes

1. The boring was terminated at a depth of approximately 25.0 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 6.0 feet below the existing ground surface.
3. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 5.0 to 25.0 feet below the ground surface. The annular space of the borehole was filled with No. 2 filter sand to a depth of approximately 3.0 feet below the ground surface. The remainder of the borehole was filled with granular bentonite. The well was finished with an approximately 1.5-foot PVC stickup with a locking cap.
4. A discrete soil sample was collected from approximately 20.0 to 26.0 feet below the ground surface to ensure recovery.

TEN BEARS ENVIRONMENTAL
NEWARK, and MILTON, DE

Boring MW-12

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		12-1027.C
Drilling Agency	**Driller**	**Date Started:**	5/7/2013
Northeast Regional Probing	Ex. 4 CBI	**Date Finished:**	5/7/2013
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track Mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler / 2-inch diameter discrete macrocore sampler		BKE

Weather	Surface Conditions	Surface Elevation	Datum
Cloudy, rain 50s	Vegetation	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.4	2.3	Dark brown fine to medium SAND, little silt	0.0
			0.4			Tan, light brown fine to medium SAND, little to trace silt	0.0
2	4	8			3.0	SAME, wet at approximately 6.0 feet	0.0
3	8	12		9.8	3.2	SAME	0.0
			9.8			Light orange, brown fine to coarse SAND, trace gravel, soil color transitions to light gray at approximately 11.5 feet	0.0
4	12	16			3.0	SAME, no gravel below approximately 15.5 feet	0.0
5	16	20		16.2	4.0	SAME	0.0
			16.2	18.8		Orange, gray CLAY	0.0
			18.8			Light brown, gray fine to medium SAND, soil color transitions to dark brown at approximately 19.7 feet	0.0
6	20	24		20.2	4.0	SAME	0.0
			20.2	23.7		Light orange, brown, light gray fine to medium SAND, little coarse sand, trace gravel	0.0
			23.7	...		Orange, gray CLAY	0.0

Notes

1. The boring was terminated at a depth of approximately 24.0 feet below the ground surface.
2. Groundwater was encountered at a depth of approximately 6.0 feet below the existing ground surface.
3. A monitoring well was constructed in the boring using 0.75-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 4.0 to 24.0 feet below the ground surface. The annular space of the borehole was filled with No. 2 filter sand to a depth of approximately 2.0 feet below the ground surface. The remainder of the borehole was filled with granular bentonite. The well was finished with an approximately 1.5-foot PVC stickup with a locking cap.

* PID = Photo-ionization detector, readings are in deflection units above background.

TEN BEARS ENVIRONMENTAL
NEWARK, and MILTON, DE

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Boring: DW-1

Page 1 of 2

Project Name	Project Location	Project Number
Procino Plating Property	Seaford, Delaware	11-1027.C

Drilling Agency	Driller	Date Started:	5/6/2013
Walton Corporation	Ex. 4 CBI	Date Finished:	5/8/2013

Drilling Equipment	Drilling Procedures	Logged by:
Truck-mounted CME 55	8 1/4-inch hollow stem auger 2-foot long, 2-inch diameter, split-spoon sampler	KJL

Weather	Surface Conditions	Surface Elevation	Datum
Overcast, 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Blow Counts	Sample Description	PID
							Auger from ground surface to 20 feet; begin sample collection at 20 ft bgs.	
1	20	22	20.0		1.2	14, 10, 13, 10	Light gray fine to medium SAND, little silt, wet	0.0
2	22	24			1.5	18, 14, 24, 16	SAME, gradually coarsening to fine to coarse SAND, little gravel, trace silt	0.0
3	24	26		24.5	1.8	3, 3, 4, 3	SAME	0.0
			24.5				Gray SILT / CLAY, trace fine sand	0.0
4	26	28			1.3	5, 4, 5, 5	SAME, seems to be more silt content, not as plastic, little fine sand	0.0
5	28	30			2.0	7, 4, 5, 5	SAME, seems to be more clay content, trace fine sand	0.0
				29.6				
			29.6	29.9			Orange fine SAND, little silt	0.0
			29.9	30.0			Dark brown SILT / CLAY, fairly plastic, trace fine sand	0.0
6	30	32	30.0		1.5	2,1,1,2	SAME	0.0
				32.0+				

Notes

1. The 8 1/4-inch boring was terminated at a depth of approximately 32.0 feet below the ground surface.
2. A 6-inch diameter polyvinyl chloride (PVC) casing was set to a depth of approximately 32.0 feet below the ground surface. The annular space of the boring was filled with a bentonite / grout mix.

* Blow Counts = The number of blows that it takes a 140-pound hammer dropped 30 inches to drive a 2-inch diameter split-spoon sampler over a 6-inch interval.

** PID = Photo-ionization detector, readings are in deflection units above background. A number in parantheses following the reading indicates the depth in feet below the existing ground surface at which the reading was obtained. Where no depth is provided, the reading is assumed to be representative of the associated soil stratum

Ten Bears Environmental

Boring: DW-1

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	5/6/2013
Walton Corporation	Ex. 4 CBI	**Date Finished:**	5/8/2013
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Truck-mounted CME 55	Mud Rotary with 2-foot long, 2-inch diameter, split-spoon sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Overcast, drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Blow Counts	Sample Description	PID
Augered 0-32 feet through center of 6" PVC; resumed sampling at 32ft.								
1	32	34	32.0	33.5	2.0	1, 4, 6, 7	Dark brown SILT / CLAY, trace fine sand	0.0
			33.5				Light gray fine SAND, trace silt, wet	0.0
2	34	36			1.3	5, 8, 12, 12	SAME, trace to little silt, wet	0.0
3	36	38			1.7	9, 9, 12, 12	SAME, lens of fine to medium sand from	0.0
				38.0			approximately 37.1 to 37.4	
4	38	40	38.0		1.5	15, 19, 24, 26	Light gray, light brown fine to medium SAND, trace	0.0
							to little coarse sand, trace silt, wet	
5	40	42			2.0	29, 31, 39, 38	Gray, light gray, orange fine to medium SAND, little	0.0
							silt, little gravel, little coarse sand, wet	
6	42	44			1.5	6, 9, 9, 15	Gray, light gray, brown fine to coarse SAND, trace	0.0
							to little silt, little gravel, wet	
7	44	46			2.0	9, 21, 23, 19	SAME, wet	0.0
							Driller indicated that soils felt soft (indication of	
							fine-grained soil) at bottom depth of sample	

Notes

1. The boring was terminated at a depth of approximately 46.0 feet below the ground surface.
2. A monitoring well was constructed in the boring using 2.0-inch nominal diameter PVC piping and No. 20 slot well screen. The screened interval was set at a depth of approximately 34.0 to 44.0 feet below the ground surface. The annular space of the borehole was filled with No. 2 filter sand to a depth of approximately 32.5 feet below the ground surface and with Quickgel bentonite to approximately 30.5 feet. The remainder of the the borehole was filled with grout. The well was finished with a concrete curbox set in sakrete.

* Blow Counts = The number of blows that it takes a 140-pound hammer dropped 30 inches to drive a 2-inch diameter split-spoon sampler over a 6-inch interval.

** PID = Photo-ionization detector, readings are in deflection units above background. A number in parantheses following the reading indicates the depth in feet below the existing ground surface at which the reading was obtained. Where no depth is provided, the reading is assumed to be representative of the associated soil stratum

Ten Bears Environmental

Boring: DW-2

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	5/6/2013
Walton Corporation	Ex. 4 CBI	**Date Finished:**	5/8/2013
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Truck-mounted CME 55	8 1/4-inch hollow stem auger 2-foot long, 2-inch diameter, split-spoon sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Overcast, drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Blow Counts	Sample Description	PID
Augered 0-20 feet, began sample collection at 20 ft bgs								
1	20	22	20.0	21.0	1.8	12, 5, 14, 29	Gray fine to medium SAND, little silt, little coarse	0.0
							sand, trace gravel, wet	
			21.0				Light brown, yellow fine to coarse SAND, little silt,	0.0
							little gravel, wet	
				22.1				
2	22	24			2.0	24, 5, 5, 6	SAME	0.0
			22.1				Gray, light brown, yellow fine to medium SAND, little	0.0
							silt, trace coarse sand, trace gravel, wet	
				25.0				
3	24	26			2.0	7, 2, 2, 3	SAME, wet	0.0
			25.0				Gray, brown SILT / CLAY, trace fine sand, wet	0.0
4	26	28			1.0	4, 3, 4, 3	SAME, little fine to medium SAND, trace gravel,	0.0
							more silt, not as plastic	
5	28	30			2.0	2, 3, 3, 5	SAME, trace fine sand, no gravel in sample	0.0
				30.0+				

Notes
1. The boring was terminated at a depth of approximately 30.0 feet below the ground surface.
2. A 6-inch diameter polyvinyl chloride (PVC) casing was set to a depth of approximately 30.0 feet below the ground surface. The annular space of the boring was filled with a bentonite / grout mix.

* Blow Counts = The number of blows that it takes a 140-pound hammer dropped 30 inches to drive a 2-inch diameter split-spoon sampler over a 6-inch interval.

** PID = Photo-ionization detector, readings are in deflection units above background. A number in parantheses following the reading indicates the depth in feet below the existing ground surface at which the reading was obtained. Where no depth is provided, the reading is assumed to be representative of the associated soil stratum

Ten Bears Environmental

Boring: DW-2

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Plating Property	Seaford, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	5/6/2013
Walton Corporation	Ex. 4 CBI	**Date Finished:**	5/8/2013
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Truck-mounted CME 55	Mud Rotary with 2-foot long, 2-inch diameter, split-spoon sampler		KJL

Weather	Surface Conditions	Surface Elevation	Datum
Overcast, drizzle 60s	Gravel	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Blow Counts	Sample Description	PID
Augered 0-30 feet through center of 6" PVC ; resumed sampling at 30ft.								
1	30	32	30.0	31.0	2.0	1, 1, 1, 1	Gray SILT / CLAY, trace fine sand, wet	0.0
			31.0				Dark brown SILT / CLAY, trace to little fine sand, lens of silt and fine sand from approximately 31.6 to 32.0 feet	0.0
2	32	34		33.6	2.0	4, 6, 16, 16	SAME, dark brown SILT / CLAY, trace to little fine sand, lens of silt and fine sand, from approximately 32.9 to 33.1	0.0
			33.6				Gray fine SAND, little silt, wet	0.0
3	34	36		34.1	1.1	9, 14, 25, 22	SAME	0.0
			34.1				Gray, yellow fine to coarse SAND, little gravel, trace to little silt, wet	0.0
4	36	38		36.9	1.0	10, 11, 10, 10	SAME	0.0
			36.9				Light gray, yellow fine SAND, little silt, wet	0.0
5	38	40			1.2	6, 11, 10, 11	SAME, wet	0.0
6	40	42		41.2	1.5	16, 26, 25, 35	SAME, wet	0.0
			41.2				Light gray, yellow fine to coarse SAND, little gravel, trace to little silt	0.0
7	42	44		42.2	1.8	5, 4, 4, 5	SAME	0.0
			42.2				Gray, dark gray SILT / CLAY, trace fine sand	0.0

Notes

1. The boring was terminated at a depth of approximately 43 feet below the ground surface.
2. A monitoring well was constructed in the boring using 2.0-inch nominal diameter PVC piping and No. 20 slot well screen. The screened interval was set at a depth of approximately 33.0 to 43.0 feet below the ground surface. The annular space of the borehole was filled with No. 2 filter sand to a depth of approximately 31.0 feet below the ground surface and with Quickgel bentonite to approximately 29.0 feet. The remainder of the the borehole was filled with grout. The well was finished with a concrete curbox set in sakrete.

* Blow Counts = The number of blows that it takes a 140-pound hammer dropped 30 inches to drive a 2-inch diameter split-spoon sampler over a 6-inch interval.

** PID = Photo-ionization detector, readings are in deflection units above background. A number in parantheses following the reading indicates the depth in feet below the existing ground surface at which the reading was obtained. Where no depth is provided, the reading is assumed to be representative of the associated soil stratum

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

5273213

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 243228 Local ID: MW-10

Tax Map/Parcel #: Ex. 6 Personal Privacy (PP)

Property Owner:

Water Well Contractor: NE Reg Probln. WC Lic #: 4223

Well Driller In Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): Direct-push

Total Depth Of Excavation (Feet BGS): 28

Construction Date: 5/7/13

CASING INSTALLATION:	INNER	OUTER (1)	OUTER (2)	OUTER (3)
Casing Top (Inches AGS):	-3			
Casing Bottom (Feet BGS):	4			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS): 4
Screen Bottom (Feet BGS): 24
Screen Diameter (Inches): 3/4
Screen Material: PVC
Screen Slot Size (1000 of an Inch): 10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify): Monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: _____ Horsepower: _____

Rated Capacity: _____ (GPM) Pump Intake Setting(ft. BGS): _____

Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump

Pump Installed By: _____ ☐ Others Date: _____

Gravel Pack: From: 2 Feet To: 24 Feet

Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug

Other: _____ From: 0 Feet To: 2 Feet

Type Of Non-Grout Backfill Of Well Annulus: N/A

From: _____ Feet To: _____ Feet

Static Water Level: 7 Feet ☑ Below ☐ Above Ground Surface

Pumping Water Level: _____ Feet On (Date): 5/7/13

After: _____ Hours Pumping Rate: _____ GPM

Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:

Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BKE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☑ Pad Mount
☐ Other - Specify: _____

Well Head Completed: 3 Inches ☐ Above ☑ Below Ground Surface

Was The Well Tag Attached In Accordance With Current Regulations?

☑ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must* note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines** (include suitable plot plan if available).

See Attached

[illegible] ED IS

Ex. 4 CBI

Signature - Well Driller In Charge of Well Construction

4234 6/4/13

Well Driller License # Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-
5278784

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 243226 Local ID: MW-11
Tax Map/Parcel #: 1-32-01.19-0026.00
Property Owner: HMS Blades Ltd
Water Well Contractor: NE Reg. Probing WC Lic #: 4223
Well Driller in Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): Direct-push
Total Depth Of Excavation (Feet BGS): 26
Construction Date: 5/7/13

CASING INSTALLATION:

	INNER	OUTER (1)	(2)	(3)
Casing Top (Inches AGS):	30			
Casing Bottom (Feet BGS):	5			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS): 5'
Screen Bottom (Feet BGS): 25
Screen Diameter (Inches): 3/4
Screen Material: PVC
Screen Slot Size (1000 of an Inch): 10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify): monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: Horsepower:
Rated Capacity: (GPM) Pump Intake Setting (ft. BGS):
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: ☐ Others Date:

Gravel Pack: From: 3 Feet To: 25 Feet
Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug
Other: From: 0 Feet To: 3 Feet
Type Of Non-Grout Backfill Of Well Annulus: N/A
From: Feet To: Feet
Static Water Level: 6 Feet ☑ Below ☐ Above Ground Surface
Pumping Water Level: Feet On (Date): 5/7/13
After: Hours Pumping Rate: GPM
Pumping Method/Device: ☐ Airlift ☐ Mechanical (Pump) Other:
Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BKE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☑ Other - Specify: PVC Stick-up
Well Head Completed: 30 Inches ☑ Above ☐ Below Ground Surface
Was The Well Tag Attached In Accordance With Current Regulations?
☑ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must* note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines** (include suitable plot plan if available).

See Attached

Ex. 4 CBI

BMITTED IS

Signature - Well Driller in Charge of Well Construction
4234 6/4/13
Well Driller License # Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7784

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-
5278784

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 243227 Local ID: MW-12
Tax Map/Parcel #: 1-32-01.19-0026.00
Property Owner: HMS Blades Ltd.
Water Well Contractor: NE Reg. Probing WC Lic #: 4223
Well Driller in Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): Direct-push
Total Depth Of Excavation (Feet BGS): 24
Construction Date: 5/7/13

CASING INSTALLATION:

	INNER	OUTER (1)	(2)	(3)
Casing Top (Inches AGS):	30			
Casing Bottom (Feet BGS):	4			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS):	4
Screen Bottom (Feet BGS):	24
Screen Diameter (Inches):	3/4
Screen Material:	PVC
Screen Slot Size (1000 of an inch):	10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify): Monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: Horsepower:
Rated Capacity: (GPM) Pump Intake Setting(ft. BGS):
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: ☐ Others Date:

Gravel Pack: From: 2 Feet To: 24 Feet
Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug
Other: From: 0 Feet To: 2 Feet
Type Of Non-Grout Backfill Of Well Annulus: N/A
From: Feet To: Feet
Static Water Level: 6 Feet ☑ Below ☐ Above Ground Surface
Pumping Water Level: Feet On (Date): 5/7/13
After: Hours Pumping Rate: GPM
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:
Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BKE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☑ Other - Specify: PVC Stick-up
Well Head Completed: 30 Inches ☑ Above ☐ Below Ground Surface
Was The Well Tag Attached In Accordance With Current Regulations?
☑ YES ☐ NO If "NO", Please Explain:

Site Plan **If different from original application, *must* note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines** (include suitable plot plan if available).

See Attached

Ex. 4 CBI

SUBMITTED IS

Signature - Well Driller in Charge of Well Construction

4234 6/4/13
Well Driller License# Date

White - DNREC • *Canary - Contractor* • *Pink - Owner* Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

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ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit # of completed well: _____ Local ID: _____

Tax Map/Parcel #: Ex. 6 Personal Privacy (PP)

Property Owner: _____

Water Well Contractor: _____ WC Lic #: _____

Well Driller in Charge during Construction: Ex. 4 CBI

WELL CONSTRUCTION METHOD

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify): _____

Total Depth of Excavation: _____

Construction Date: _____

CASING INSTALLATION:

	INNER CASING (1)	(2)	(3)	(4)	(5)	(6)	OUTER CASING
CASING TOP:							
CASING BOTTOM:							
CASING DIAMETER:							
CASING MATERIAL:							

SCREEN INSTALLATION

SCREEN TOP:						
SCREEN BOTTOM:						
SCREEN DIAMETER:						
SCREEN MATERIAL:	PVC					

Gravel Pack From: _____ ft. To: _____ ft.

Grout Type: ☒ Cement ☐ Bentonite Clay

☐ Other: _____ From: _____ ft. To: _____ ft.

Type of Non-Grout backfill of Well Annulus: _____

From: _____ To: _____

Static Water Level: _____ ft. ☒ Below OR ☐ Above Ground Surface

On (date): _____

Pumping Water Level: _____ ft. On (date): _____

After: _____ hrs. Pumping at: _____ GPM

Was a Geophysical Log Taken? ☐ YES ☒ NO

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☐ Other - Specify: _____

Well Head Completed: _____ inches ☐ Above (OR) ☐ Below Ground Surface

Was the Well Tag attached in accordance with current regulations?

☐ YES ☐ NO If "NO", Please Explain: _____

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: _____

Rated Capacity (GPM): _____

Pump Intake Setting: _____ Ft. Below Ground Surface: _____

Pump Installed By: _____ On (date): _____

The location and construction of this well is in Compliance with all permit conditions and all applicable well construction regulations.

☒ YES ☐ NO

If "NO," attach a copy of the approved well permit showing the revised location clearly marked.

COMMENTS: _____

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS A

Ex. 4 CBI

Signature - Well Driller in Charge of Well Construction

License # _____ Date _____

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/78/01/03 - EC 7

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

FORMATION LOG

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

PAGE _____ OF _____ PAGES

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PERMIT# 242332 LOCAL ID# MW-1

PROPERTY OWNER Ex. 6 Personal Privacy (PP)

WELL CONTRACTOR Ex. 4 CBI LIC#

DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
Top soil	0.0	1.0
Br (F-C) sand w/ tr silt	1.0	20.0
Br + Gr clay w/ (F-C) sand	20.0	26.0
Gr Clay w/ tr (F) sand	22.0	32.0
Br (F-C) sand w/ tr silt	32.0	40.0
Br (F-C) sand + gravel	40.0	44.0

OTHER COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

Ex. 4 CBI

Signature of Well Driller In Charge License# 1517 Date 5-10-13

White - DNREC • Canary - Contractor • Pink - Owner Doc. No. 40-08-82-12-11

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

WELL COMPLETION REPORT

- OFFICIAL USE ONLY -

PAGE _____ OF _____ PAGES

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit # of completed well: _____ Local ID: _____

Tax Map/Parcel #: Ex. 6 Personal Privacy (PP)

Property Owner: _____

Water Well Contractor: _____ WC Lic #: _____

Well Driller in Charge during Construction: Ex. 4 CBI

WELL CONSTRUCTION METHOD

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify): _____

Total Depth of Excavation: _____

Construction Date: _____

CASING INSTALLATION:

	INNER CASING (1)	(2)	(3)	(4)	(5)	(6)	OUTER CASING
CASING TOP:							
CASING BOTTOM:							
CASING DIAMETER:							
CASING MATERIAL:							

SCREEN INSTALLATION

SCREEN TOP:						
SCREEN BOTTOM:						
SCREEN DIAMETER:						
SCREEN MATERIAL:						

Gravel Pack From: _____ ft. To: _____ ft.

Grout Type: ☐ Cement ☐ Bentonite Clay

☐ Other: _____ From: _____ ft. To: _____ ft.

Type of Non-Grout backfill of Well Annulus: _____

From: _____ To: _____

Static Water Level: _____ ft. ☒ Below OR ☐ Above Ground Surface

On (date): _____

Pumping Water Level: _____ ft. On (date): _____

After: _____ hrs. Pumping at: _____ GPM

Was a Geophysical Log Taken? ☐ YES ☒ NO

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☒ Other - Specify: _____

Well Head Completed: _____ inches ☐ Above (OR) ☐ Below Ground Surface

Was the Well Tag attached in accordance with current regulations?

☐ YES ☐ NO If "NO", Please Explain: _____

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: _____

Rated Capacity (GPM): _____

Pump Intake Setting: _____ Ft. Below Ground Surface: _____

Pump Installed By: _____ On (date): _____

The location and construction of this well is in Compliance with all permit conditions and all applicable well construction regulations.

☐ YES ☐ NO

If "NO," attach a copy of the approved well permit showing the revised location clearly marked.

COMMENTS: _____

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.

Ex. 4 CBI

Signature - Well Driller in Charge of Well Construction

License # Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/78/01/03 - EC 7

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

FORMATION LOG

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

PAGE _____ OF _____ PAGES

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PERMIT# 242-333 LOCAL ID# MW-2

PROPERTY OWNER Ex. 6 Personal Privacy (PP)

WELL CONTRACTOR Ex. 4 CBI LIC# 52

DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
Top Soil	0	1
Br (F-C) sand w/ tr silt	1	20.0
Br + Gr Clay w/ (F-C) sand	20.0	26.0
Br clay w/ tr (F) sand	26.0	32.0
Br (F-C) sand w/ tr silt	32.0	40.0
Br (F-C) sand + Gravel	40.0	46.0

OTHER COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

Ex. 4 CBI

Signature of Well Driller in Charge | License# 4517 | Date 5-16-13

White - DNREC • Canary - Contractor • Pink - Owner Doc. No. 40-08-82-12-11

Appendix D-3
Phase II RI
Groundwater Sample Collection
Field Data Sheets

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-6 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 17.7 feet	9.11 feet	8.59 feet	± 0.3 gallons	5/16/2013 0903 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1007 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1008	6.13	0.119	91.8	3.61	16.46	46
1011	6.11	0.150	60.6	3.03	16.23	49
1014	6.14	0.157	32.6	4.32	16.31	62
1017	6.15	0.158	19.4	4.51	16.38	66
1020	6.15	0.160	10.0	4.63	16.17	69
1023	6.16	0.164	4.5	4.62	16.19	70

Sample collected for laboratory analysis at 1024 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-6 (D)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 17.7 feet	9.11 feet	8.59 feet	± 0.3 gallons	5/16/2013 0903 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 0940 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
0942	6.72	0.084	1,000 (flashing)	2.09	18.52	118
0945	6.30	0.088	511	2.55	16.43	135
0948	6.09	0.113	101	3.38	15.78	155
0951	6.07	0.135	33.9	3.93	15.63	168
0955	6.09	0.141	16.3	4.32	15.59	163
1000	6.11	0.147	5.6	4.51	15.51	108
1003	6.11	0.149	1.9	4.55	15.46	96

Sample collected for laboratory analysis at 1005 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 16.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-7 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 29.47 feet	9.02 feet	20.45 feet	± 1.3 gallons	5/16/2013 0904 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1046 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1048	5.85	0.104	14.9	5.98	21.14	198
1051	5.86	0.107	33.6	5.90	21.40	204
1055	5.78	0.120	88.4	5.77	21.98	212
1058	5.78	0.121	42.1	5.85	22.31	214
1101	5.77	0.123	18.2	5.70	22.71	218

Sample collected for laboratory analysis at 1103 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-7 (D)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 29.47 feet	9.02 feet	20.45 feet	± 1.3 gallons	5/16/2013 0904 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1030 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1033	6.07	0.096	898	6.58	20.37	139
1038	5.71	0.113	168	5.94	20.46	185
1041	5.70	0.119	89.7	5.80	20.54	194
1044	5.72	0.123	36.1	5.78	20.67	201

Sample collected for laboratory analysis at 1045 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 27.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-8 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.04 feet	6.45 feet	17.59 feet	± 1.1 gallons	5/16/2013 0857 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1223 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1226	7.15	0.196	0.0	6.42	15.97	439
1229	7.04	0.180	0.0	6.51	15.75	446
1232	6.91	0.170	0.0	7.16	15.72	451
1235	6.90	0.167	0.0	7.10	15.65	453
1238	6.85	0.167	0.0	6.93	15.64	455

Sample collected for laboratory analysis at 1238 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 8.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-8 (D)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.04 feet	6.45 feet	17.59 feet	± 1.1 gallons	5/16/2013 0857 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1153 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1157	9.53	0.257	0.9	3.08	16.05	301
1200	8.98	0.197	0.0	4.15	15.66	381
1203	8.47	0.180	0.0	4.44	15.74	414
1206	8.06	0.179	0.0	4.85	15.89	430
1209	7.76	0.178	0.0	5.22	15.92	439
1212	7.55	0.178	0.0	5.50	15.88	445
1215	7.34	0.176	0.0	5.76	15.95	451

Sample collected for laboratory analysis at 1215 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 22.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-9 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.57 feet	6.60 feet	19.97 feet	± 1.24 gallons	5/16/2013 0854 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1052 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1055	6.33	0.269	0.9	6.26	14.86	421
1058	6.32	0.263	0.0	5.65	14.77	423
1101	6.31	0.264	0.0	5.57	14.74	424
1104	6.31	0.265	0.0	5.40	14.77	424

Sample collected for laboratory analysis at 1105 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 8.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-9 (D)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.57 feet	6.60 feet	19.97 feet	± 1.24 gallons	5/16/2013 0854 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1025 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1028	6.40	0.278	3.8	8.73	15.00	383
1031	6.27	0.254	0.0	7.69	14.83	397
1034	6.24	0.253	0.0	6.82	14.86	404
1037	6.23	0.254	0.0	6.27	14.94	411
1040	6.24	0.256	0.0	6.42	14.86	415

Sample collected for laboratory analysis at 1040 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 24.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-10 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.0 feet	7.98 feet	16.02 feet	± 1.0 gallons	5/16/2013 0906 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1136 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1138	6.13	0.126	23.6	7.01	18.36	135
1141	6.00	0.151	33.5	5.19	17.56	132
1144	6.06	0.162	33.0	5.16	17.29	132
1142	6.04	0.162	13.6	5.20	17.30	133

Sample collected for laboratory analysis at 1148 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-10 (D)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.0 feet	7.98 feet	16.02 feet	± 1.0 gallons	5/16/2013 0906 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1119 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1121	5.94	0.155	129	5.97	20.56	163
1124	6.06	0.153	116	5.83	18.86	133
1127	6.05	0.151	106	5.38	18.20	135
1130	6.04	0.152	78.0	5.40	17.96	137
1133	6.03	0.155	77.5	4.99	17.85	138

Sample collected for laboratory analysis at 1134 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 22.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-11 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.2 feet	8.27 feet	17.93 feet	± 1.12 gallons	5/16/2013 0907 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1335 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1338	6.60	0.206	107	6.32	14.61	300
1341	6.56	0.205	27	6.21	14.43	303
1344	6.52	0.205	3.9	6.08	14.25	303
1347	6.49	0.204	0.0	6.31	14.23	306
1350	6.46	0.203	0.0	6.37	14.23	307

Sample collected for laboratory analysis at 1350 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-11 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.2 feet	8.27 feet	17.93 feet	± 1.12 gallons	5/16/2013 0907 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1310 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1313	6.94	0.208	364	6.76	15.13	243
1316	6.80	0.208	117	6.09	14.77	287
1319	6.69	0.208	24.4	5.89	14.59	296
1322	6.63	0.209	0.7	5.71	14.56	302
1325	6.59	0.209	0.0	5.59	14.62	309

Sample collected for laboratory analysis at 1325 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 24.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-12 (S)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 25.37 feet	8.18 feet	17.19 feet	± 1.1 gallons	5/16/2013 0908 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1301 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1302	5.98	0.128	398	9.13	16.05	179
1307	5.85	0.153	45.0	9.30	16.03	1997
1316	5.86	0.163	0.0	8.97	15.72	204
1319	5.85	0.165	0.0	8.77	15.70	205

Sample collected for laboratory analysis at 1320 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc -

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: DW-1

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 44.0 feet	9.25 feet	34.75 feet	± 6.0 gallons	5/16/2013 0856 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1125 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1128	10.90	1.49	4.6	3.02	20.17	-14
1131	11.20	1.52	5.4	2.02	19.35	-45
1134	11.28	1.49	0.9	1.96	19.24	-56
1137	11.33	1.48	2.0	1.98	18.98	-60
1140	11.36	1.45	1.8	1.97	19.00	-62

Sample collected for laboratory analysis at 1140 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: Intake was set approximately 39.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: DW-2

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 43.0 feet	9.03 feet	33.97 feet	± 5.7 gallons	5/16/2013 0853 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 0950 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
0957	6.47	0.230	18.5	5.67	16.34	345
1000	6.48	0.251	11.4	4.35	16.42	326
1003	6.65	0.344	5.5	3.32	16.39	314
1006	6.65	0.348	3.5	3.24	16.31	310
1009	6.62	0.338	4.0	3.08	06.35	306
1012	6.56	0.325	1.2	2.97	16.38	302
1015	6.50	0.312	2.2	2.92	16.39	295

Sample collected for laboratory analysis at 1015 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: Intake was set approximately 38.0 feet below the top of the well casing.

Appendix D-4
Phase II Groundwater Samples
Laboratory Summary Data Package –May 2013

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

May 30, 2013

Project: 11-1027.A

Submittal Date: 05/17/2013
Group Number: 1390883
SDG: TBG21
PO Number: 11-1027.A
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LLI) #
DW-1 Grab Groundwater	7061348
DW-2 Grab Groundwater	7061349
Wingate-DW Grab Groundwater	7061350
MW-8(S) Grab Groundwater	7061351
MW-8(D) Grab Groundwater	7061352
MW-8(D)MS Grab Groundwater	7061353
MW-8(D)SD Grab Groundwater	7061354
MW-8(D)DUP Grab Groundwater	7061355
MW-9(S) Grab Groundwater	7061356
MW-9(D) Grab Groundwater	7061357
MW-10(S) Grab Groundwater	7061358
MW-10(D) Grab Groundwater	7061359
MW-6(S) Grab Groundwater	7061360
MW-6(D) Grab Groundwater	7061361
MW-7(S) Grab Groundwater	7061362
MW-7(D) Grab Groundwater	7061363
MW-11(S) Grab Groundwater	7061364
MW-11(D) Grab Groundwater	7061365
MW-12(S) Grab Groundwater	7061366
MW-12(D) Grab Groundwater	7061367

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

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Analysis Report

Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Analysis Report

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Sample Description: DW1 Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061348
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 11:40 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

027DI SDG#: TBG21-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW846 6010B**		**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.0041 J	0.0011	1
Wet Chemistry	**SW846 9012A**		**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:19	Ex. 4 CBI	1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1
08255	Total Cyanide (water)	SW846 9012A	1	13149117101A	05/30/2013 07:44		1
08256	Cyanide Water Distillation	SW846 9012A	1	13149117101A	05/29/2013 12:00		1

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Analysis Report

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Sample Description: DW2 Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061349
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 10:15 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

027D2 SDG#: TBG21-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW846 6010B**		**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1
Wet Chemistry	**SW846 9012A**		**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:23	Ex. 4 CBI	1
01848	WWSW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1
08255	Total Cyanide (water)	SW846 9012A	1	13149117101A	05/30/2013 07:46		1
08256	Cyanide Water Distillation	SW846 9012A	1	13149117101A	05/29/2013 12:00		1

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Analysis Report

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Sample Description: Wingate-DW Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061350
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:25 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

027DW SDG#: TBG21-03FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW846 6010B**		**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	0.0115 J	0.0011	1
Wet Chemistry	**SW846 9012A**		**mg/l**	**mg/l**	
08255	Total Cyanide (water)	57-12-5	0.0088 J	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:34	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1
08255	Total Cyanide (water)	SW846 9012A	1	13149117101A	05/30/2013 07:49		1
08256	Cyanide Water Distillation	SW846 9012A	1	13149117101A	05/29/2013 12:00		1

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Analysis Report

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Sample Description: MW8(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061351
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:38 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0278S SDG#: TBG21-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:38	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

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Sample Description: MW-8(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061352
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:15 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0278D SDG#: TBG21-05BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	131401848005	05/21/2013 21:56	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-8(D)MS Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061353
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:15 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0278D SDG#: TBG21-05MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.203	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	131401848005	05/21/2013 22:08	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW8(D)SD Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061354
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:15 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0278D SDG#: TBG21-05MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.199	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:12	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-8(D) DUP Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061355
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 12:15 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0278D SDG#: TBG21-05DUP

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	131401848005	05/21/2013 22:04	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW9(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061356
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 11:05 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0279S SDG#: TBG21-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:42	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW9(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061357
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 10:40 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0279D SDG#: TBG21-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:46	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW10(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061358
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 11:48 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2710S SDG#: TBG21-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.193	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:49	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW10(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061359
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 11:34 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2710D SDG#: TBG21-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.148	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:53	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW6(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061360
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 10:24 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0276S SDG#: TBG21-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.319	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 22:57	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW6(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061361
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 10:05 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0276D SDG#: TBG21-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.257	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:01	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW7(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061362
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 11:03 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0277S SDG#: TBG21-12

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0607	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:04	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061363
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 10:45 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

0277D SDG#: TBG21-13

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0820	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	131401848005	05/21/2013 23:08	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

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Sample Description: MW11(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061364
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 13:50 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2711S SDG#: TBG21-14

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0063 J	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:19	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW11(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061365
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 13:25 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2711D SDG#: TBG21-15

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0052 J	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:23	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW12(S) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061366
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 13:20 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2712S SDG#: TBG21-16

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:27	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW12(D) Grab Groundwater
Procino Plating - 11-1027.A

LLI Sample # WW7061367
LLI Group # 1390883
Account # 10855

Project Name: 11-1027.A

Collected: 05/16/2013 13:00 by DB

Submitted: 05/17/2013 17:20
Reported: 05/30/2013 13:57

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2712D SDG#: TBG21-17*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0011	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW846 6010B	1	131401848005	05/21/2013 23:31	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW846 3005A	1	131401848005	05/21/2013 10:00		1

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 05/30/13 at 01:57 PM

Group Number: 1390883

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 131401848005	Sample number(s): 7061348-7061367							
Chromium	N.D.	0.0011	mg/l	100		90-110		
Batch number: 13149117101A	Sample number(s): 7061348-7061350							
Total Cyanide (water)	N.D.	0.0050	mg/l	96		90-110		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 131401848005	Sample number(s): 7061348-7061367 UNSPK: 7061352 BKG: 7061352								
Chromium	101	99	81-120	2	20	N.D.	N.D.	0 (1)	20
Batch number: 13149117101A	Sample number(s): 7061348-7061350 UNSPK: 7061349 BKG: 7061349								
Total Cyanide (water)	88		43-137			N.D.	N.D.	0 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

10 BEAR

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 For Eurofins Lancaster Laboratories use only Group # 1390883 Sample # 7861348-67
Instructions on reverse side correspond with circled numbers.

COC # 323914
Page 1 of 2

1 Client Information

Client: Ten Bears Environmental
Acct. #:
Project Name/#: Procino Plating
PWSID #:
Project Manager:
P.O. #: 11-1027-A
Quote #:

Ex. 4 CBI

DE

4 Matrix: Sediment ☐ Soil ☐ Ground ☑ Potable ☐ Surface ☐ NPDES ☐ Water ☑ Other: ____

5 Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#: 139438

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

6 Remarks

2 Sample Identification	Collected Date	Collected Time	3 Grab	Composite	Total # of Containers	Chromium Total	Total Cyanide	Remarks
DW-1	5/16/13	1140	X		2	X	X	
DW-2		[redacted] 1015			2	X	X	
Wingate - DW		1225			2	X	X	Duplicate
MW-8 (S)		1238			1			
MW-8 (D)		1215						MS+MSD
MW-9 (S)		1105						
MW-9 (D)		1040						
MW-10 (S)		1148						
MW-10 (D)		1134						

7 Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)

Date results are needed: ____

E-mail address: ____

8 Data Package Options (circle if required)
Type I (Validation/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
Type IV (CLP SOW) MA MCP CT RCP

DE SOP & EDD

Relinquished by	Date	Time	Received by	Date	Time
	5-13-13	1310		5/13/13	1310
	5/17/13	1535		5/17/13	1535
	5/17/13	1720			
				5/17/13	1720

Ex. 4 CBI

Ex. 4 CBI

EDD Required? Yes No
If yes, format: ____
Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____
Temperature upon receipt 4.3 °C

Eurofins Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management
7044.02

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 For Eurofins Lancaster Laboratories use only Group # 1390883 Sample # 7061348-67

Instructions on reverse side correspond with circled numbers.

COC #323915

Page 2 of 2

1 Client Information

Client: Ten Bears Environmental

Acct. #:

Project Name/#: Procino Plating

PWSID #:

Project Manager: Ex. 4 CBI

P.O. #: 11-1027.A

Quote #:

Name of state where samples were collected: DE

4 Matrix: Soil ☐ Sediment ☐ Water: Potable ☐ Ground ☑ NPDES ☐ Surface ☐ Other: ____

5 Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

6 Remarks

2 Sample Identification	Collected Date	Collected Time	3 Grab	Composite	Total # of Containers	Total Chromium
MW-6 (S)	5/16/13	1024	X		1	X
MW-6 (D)		1005				
MW-7 (S)		1103				
MW-7 (D)		1045				
MW-11 (S)		1350				
MW-11 (D)		1325				
MW-12 (S)		1320				
MW-12 (D)		1300				

7 Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)

Date results are needed: ____

E-mail address: ____

8 Data Package Options (circle if required)
Type I (Validation/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
Type IV (CLP SOW) MA MCP CT RCP

Ex. 4 CBI

Relinquished by	Date	Time	Received by	Date	Time
	5/17/13	1535		5/17/13	1535
	5/17/13	1720			
Relinquished by	Date	Time			
Relinquished by	Date	Time			

Ex. 4 CBI

9

Date	Time
5/17/13	1720

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 4.3 °C

DE SOP + EDD

Eurofins Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management
7044.02

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX E

Phase III (2014) RI Information

E-1 Phase III Groundwater Sample Collection Field Sheets (May 2014)

E-2 Phase III Groundwater Sample Laboratory Summary Data Package (May 2014)

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-1 (DNREC WSS ID - 235312)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	7.40 feet	10.6 feet	± 0.4 gallons	5/29/2014 0909 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1033 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1035	6.61	0.062	12.7	8.86	13.75	204
1038	6.46	0.066	11.2	8.54	13.67	215
1041	6.38	0.072	11.1	8.95	13.62	222
1044	6.31	0.073	10.1	8.64	13.61	227

Sample collected for laboratory analysis at 1045 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-2 (DNREC WSS ID - 235308)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	7.05 feet	10.95 feet	± 0.4 gallons	5/28/2014 0936 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1301 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1306	6.59	0.205	31.8	11.03	17.56	190
1309	6.54	0.209	0.0	7.04	15.97	193
1312	6.52	0.210	0.0	6.58	15.93	193
1315	6.53	0.219	0.0	6.19	15.99	196

Sample collected for laboratory analysis at 1310 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-3 (DNREC WSS ID - 235307)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	8.29 feet	9.71 feet	± 0.34 gallons	5/28/2014 0935 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1207 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
121	6.66	0.169	445	9.36	15.59	166
1213	6.47	0.161	41.9	7.32	15.09	182
1216	6.35	0.193	3.0	6.29	14.92	194
1219	6.27	0.158	0.0	6.27	14.88	201
1222	6.23	0.158	0.0	6.24	14.88	206

Sample collected for laboratory analysis at 1225 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-4 (DNREC WSS ID - 235309)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	10.36 feet	7.64 feet	± 0.3 gallons	5/28/2014 0933 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1051 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1053	6.76	0.161	2.9	5.95	16.18	87
1056	6.59	0.161	1.9	3.37	15.79	107
1059	6.58	0.162	0.2	3.30	15.77	109
1102	6.56	0.161	0.0	3.01	15.74	113

Sample collected for laboratory analysis at 1105 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-5 (DNREC WSS ID - 235310)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	10.03 feet	7.97 feet	± 0.3 gallons	5/28/2014 1000 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately ml/min
PURGE START TIME: hrs.
TOTAL VOLUME PURGED: Approximately gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1019	7.19	0.183	0.0	13.48	16.51	129
1024	6.97	0.178	0.0	11.94	16.93	69
1027	6.90	0.181	0.0	11.78	16.15	57
1030	6.89	0.178	0.0	11.29	16.41	44
1033	6.88	0.179	0.0	11.19	16.59	41

Sample collected for laboratory analysis at 1035 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 3
250 ml NaOH/asc 3

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-6 (DNREC WSS ID - 235311)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 18 feet	9.27 feet	8.73 feet	± 0.3 gallons	5/29/2014 0905 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1101 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1104	6.36	0.066	13.2	3.19	14.35	12
1107	6.32	0.079	6.2	1.97	14.32	16
1110	6.31	0.110	4.4	1.75	14.31	27
1113	6.32	0.125	5.5	2.25	14.32	30

Sample collected for laboratory analysis at 1115 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-7 (DNREC WSS ID - 238779)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 27.5 feet	9.18 feet	18.32 feet	± 0.64 gallons	5/29/2014 0903 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 1119 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1121	6.34	0.085	0.0	7.97	14.35	97
1127	6.12	0.087	0.0	6.23	14.40	176
1135	6.03	0.123	0.0	5.48	14.43	209
1138	6.02	0.129	0.0	5.45	14.44	215

Sample collected for laboratory analysis at 1140 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at approximately 17.5 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-8 (DNREC WSS ID - 238780)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24 feet	6.56 feet	17.44 feet	± 1.0 gallons	5/28/2014 0855 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 1457 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1501	8.78	0.178	0.0	7.12	16.08	108
1504	8.28	0.158	0.0	6.82	15.77	146
1507	7.79	0.160	0.0	6.77	15.65	173
1510	7.57	0.160	0.0	6.71	15.68	184
1513	7.41	0.192	0.0	6.72	15.66	192

Sample collected for laboratory analysis at 1515 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 14.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-9 (DNREC WSS ID - 238781)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24 feet	6.13 feet	17.87 feet	± 1.1 gallons	5/28/2014 0939 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 1351 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1354	6.70	0.481	27.4	9.34	15.31	174
1357	6.66	0.340	0.4	7.32	15.15	183
1400	6.60	0.305	0.0	6.57	15.03	191
1403	6.52	0.275	0.0	5.61	14.95	202
1406	6.51	0.270	0.0	5.50	14.95	203

Sample collected for laboratory analysis at 1408 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 17.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-10 (DNREC WSS ID - 243228)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24 feet	8.07 feet	15.93 feet	± 1.0 gallons	5/28/2014 0952 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately < 100 ml/min
PURGE START TIME: 1529 hrs.
TOTAL VOLUME PURGED: Approximately < 1.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1532	7.24	0.105	16.2	6.40	15.05	198
1535	7.06	0.119	88.2	5.20	15.05	211
1538	6.94	0.129	35.4	4.86	14.93	217
1541	6.84	0.136	7.8	5.08	14.83	222
1544	6.74	0.138	0.0	4.98	14.78	225

Sample collected for laboratory analysis at 1546 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled:

250 ml HNO_3	1
250 ml NaOH/asc	1

Comments: Intake set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-10 (DNREC WSS ID - 243228)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24 feet	8.07 feet	15.93 feet	± 1.0 gallons	5/28/2014 0952 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately < 100 ml/min
PURGE START TIME: 1550 hrs.
TOTAL VOLUME PURGED: Approximately < 1.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1554	6.58	0.165	333	5.67	15.49	217
1557	6.56	0.157	357	5.29	15.23	217
1600	6.52	0.145	171	5.14	14.98	215
1603	6.48	0.144	80.5	5.06	14.89	215
1606	6.45	0.144	10.5	5.11	14.86	215

Sample collected for laboratory analysis at 1608 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled:
250 ml HNO_3 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 22.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-11 (DNREC WSS ID - 243226)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 25 feet	8.35 feet	16.65 feet	± 1.0 gallons	5/29/2014 0920 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 1000 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1002	6.62	0.237	237	13.24	13.69	201
1005	6.50	0.240	51.0	12.58	13.62	241
1008	6.48	0.243	10.1	12.43	13.61	205
1011	6.47	0.242	1.9	12.32	13.60	206

Sample collected for laboratory analysis at 1015 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 15.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-12 (DNREC WSS ID - 243227)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 25 feet	8.24 feet	16.76 feet	± 1.0 gallons	5/29/2014 0917 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 0928 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
0935	6.62	0.324	0.0	5.97	14.19	190
0938	6.54	0.340	0.0	5.49	14.02	196
0941	6.50	0.345	0.0	5.93	13.94	200
0945	6.47	0.348	0.0	5.34	13.85	205

Sample collected for laboratory analysis at 0948 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 14.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: DW-1 (DNREC WSS ID - 242332)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 44.0 feet	9.07 feet	34.93 feet	± 23.1 gallons	5/28/2014 0941 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 to 400 ml/min
PURGE START TIME: 1420 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1423	9.39	0.339	0.0	2.11	16.87	75
1426	9.86	0.343	0.0	1.04	16.87	51
1429	10.09	0.351	0.0	0.83	16.57	35
1432	10.16	0.354	0.0	0.74	16.67	25
1435	10.21	0.357	0.0	0.79	16.66	16

Sample collected for laboratory analysis at 1438 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 39.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: DW-2 (DNREC WSS ID - 242333)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 43.0 feet	8.83 feet	34.17 feet	± 23.0 gallons	5/28/2014 0938 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1328 hrs.
TOTAL VOLUME PURGED: Approximately 2.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1331	6.93	0.299	0.0	2.96	16.42	145
13334	6.97	0.283	0.0	2.15	16.31	146
1337	6.91	0.263	0.0	1.66	16.22	148
1340	6.75	0.243	0.0	1.18	16.23	154
1343	6.65	0.232	0.0	1.03	16.30	159

Sample collected for laboratory analysis at 1345 hrs.

Laboratory analysis requested: Total chromium, Cyanide

Bottles Filled: 250 ml HNO_3 (filtered) 1
250 ml NaOH/asc 1

Comments: The sampling intake was set at a depth of approximately 38.0 feet below the top of the well casing.

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Analysis Report

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

June 06, 2014

Project: 12-1027.C

Submittal Date: 05/30/2014
Group Number: 1478389
SDG: TBG56
PO Number: 12-1027.C
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
MW-2 Grab Groundwater	7483230
MW-3 Grab Groundwater	7483231
MW-4 Grab Groundwater	7483232
MW-5 Grab Groundwater	7483233
MW-5 MS Grab Groundwater	7483234
MW-5 MSD Grab Groundwater	7483235
MW-5 DUP Grab Groundwater	7483236
MW-6 Grab Groundwater	7483237
MW-8 Grab Groundwater	7483238
MW-9 Grab Groundwater	7483239
MW-10S Grab Groundwater	7483240
MW-11 Grab Groundwater	7483241
MW-12 Grab Groundwater	7483242
DW-1 Grab Groundwater	7483243
DW-2 Grab Groundwater	7483244
DOMESTIC WELL Grab Potable Water	7483245
MW-10D Grab Groundwater	7483246

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

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Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Sample Description: MW-2 Grab Groundwater
12-1027.C

LL Sample # WW 7483230
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 13:18 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C02 SDG#: TBG56-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:13	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:39		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-3 Grab Groundwater
12-1027.C

LL Sample # WW 7483231
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 12:25 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C03 SDG#: TBG56-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:16	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:40		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-4 Grab Groundwater
12-1027.C

LL Sample # WW 7483232
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 11:05 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C04 SDG#: TBG56-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:27	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:42		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Analysis Report

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Sample Description: MW-5 Grab Groundwater
12-1027.C

LL Sample # WW 7483233
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 10:35 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C05 SDG#: TBG56-04BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 05:51	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:43		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Analysis Report

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Sample Description: MW-5 MS Grab Groundwater
12-1027.C

LL Sample # WW 7483234
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 10:35 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C05 SDG#: TBG56-04MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.208	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	0.098	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:02	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:45		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-5 MSD Grab Groundwater
12-1027.C

LL Sample # WW 7483235
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 10:35 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C05 SDG#: TBG56-04MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.207	0.0016	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:05	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1

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Sample Description: MW-5 DUP Grab Groundwater
12-1027.C

LL Sample # WW 7483236
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 10:35 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C05 SDG#: TBG56-04DUP

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 05:58	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:44		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-6 Grab Groundwater
12-1027.C

LL Sample # WW 7483237
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 11:15 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C06 SDG#: TBG56-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.222	0.0016	1
Wet Chemistry		**SW-846 9012A**	mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:31	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:46		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-8 Grab Groundwater
12-1027.C

LL Sample # WW 7483238
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 15:15 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C08 SDG#: TBG56-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:34	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:47		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-9 Grab Groundwater
12-1027.C

LL Sample # WW 7483239
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 14:08 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C09 SDG#: TBG56-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:38	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:51		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-10S Grab Groundwater
12-1027.C

LL Sample # WW 7483240
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 15:46 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2710S SDG#: TBG56-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.136	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:42	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:52		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Sample Description: MW-11 Grab Groundwater
12-1027.C

LL Sample # WW 7483241
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 10:15 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27-11 SDG#: TBG56-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.0061 J	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:45	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:53		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-12 Grab Groundwater
12-1027.C

LL Sample # WW 7483242
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 09:48 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27C12 SDG#: TBG56-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:49	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101A	06/05/2014 16:54		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101A	06/05/2014 08:20		1

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Analysis Report

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Sample Description: DW-1 Grab Groundwater
12-1027.C

LL Sample # WW 7483243
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 14:38 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27CD1 SDG#: TBG56-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:53	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101B	06/05/2014 16:56		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101B	06/05/2014 08:20		1

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Analysis Report

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Sample Description: DW-2 Grab Groundwater
12-1027.C

LL Sample # WW 7483244
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 13:28 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27CD2 SDG#: TBG56-12

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 06:56	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101B	06/05/2014 16:59		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101B	06/05/2014 08:20		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DOMESTIC WELL Grab Potable Water
12-1027.C

LL Sample # PW 7483245
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 12:05 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

27CDW SDG#: TBG56-13

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	0.0103 J	0.0016	1
	The EPA has set a maximum contaminant level of 0.1 mg/l for chromium. The state of Pennsylvania has set a maximum contaminant level of 0.05 mg/l for chromium.				
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1
	The EPA has set a maximum contaminant level of 0.2 mg/l for cyanide.				

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 07:00	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101B	06/05/2014 17:00		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101B	06/05/2014 08:20		1

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Analysis Report

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Sample Description: MW-10D Grab Groundwater
12-1027.C

LL Sample # WW 7483246
LL Group # 1478389
Account # 10855

Project Name: 12-1027.C

Collected: 05/28/2014 16:08 by BE

Submitted: 05/30/2014 18:30
Reported: 06/06/2014 08:56

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

2710D SDG#: TBG56-14*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.139	0.0016	1
Wet Chemistry		**SW-846 9012A**	mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1
	The EPA has set a maximum contaminant level of 0.2 mg/l for cyanide.				

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141541848002	06/05/2014 07:11	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141541848002	06/04/2014 01:00		1
08255	Total Cyanide (water)	SW-846 9012A	1	14156117101B	06/05/2014 17:01		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14156117101B	06/05/2014 08:20		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 06/06/14 at 08:56 AM

Group Number: 1478389

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 141541848002	Sample number(s): 7483230-7483246							
Chromium	N.D.	0.0016	mg/l	103		90-110		
Batch number: 14156117101A	Sample number(s): 7483230-7483234,7483236-7483242							
Total Cyanide (water)	N.D.	0.0050	mg/l	94		90-110		
Batch number: 14156117101B	Sample number(s): 7483243-7483246							
Total Cyanide (water)	N.D.	0.0050	mg/l	94		90-110		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 141541848002	Sample number(s): 7483230-7483246 UNSPK: 7483233 BKG: 7483233								
Chromium	104	104	76-120	1	20	N.D.	N.D.	0 (1)	20
Batch number: 14156117101A	Sample number(s): 7483230-7483234,7483236-7483242 UNSPK: 7483233 BKG: 7483233								
Total Cyanide (water)	49		43-137			N.D.	N.D.	0 (1)	20
Batch number: 14156117101B	Sample number(s): 7483243-7483246 UNSPK: 7483243 BKG: 7483243								
Total Cyanide (water)	101		43-137			N.D.	N.D.	0 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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1 of 2

Acct. # 10855 For Eurofins Lancaster Laboratories Environmental use only Group # 1478389 Sample # 14833046
Instructions on reverse side correspond with circled numbers.

COC #352757

1 Client Information

Client: TEN BEARS ENVIRONMENTAL
Acct. #: 10855
Project Name/#: 12-1027.C
PWSID #:
Project #: Ex. 4 CBI
P.O. #:
Sampler: BE
Quote #:
Name of state where samples were collected: DE

For Lab Use Only
FSC:
SCR#: 1510385

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

2 Sample Identification / 3 / 4 Matrix / 5 Analysis Requested

Sample Identification	Collected Date	Collected Time	3 Grab	3 Composite	4 Sediment	4 Soil	4 Ground Water	4 Potable	4 Surface	4 NPDES	4 Other:	Total # of Containers	Total Chromium	Cyanide	6 Remarks
mw-1	5/29/14	1045	X				X					2	X	X	sample not rec'd @ ELLE until 6/2/14
mw-2	5/28/14	1318	X				X					2	X	X	
mw-3	5/28/14	1225	X				X					2	X	X	
mw-4	5/28/14	1105	X				X					2	X	X	
mw-5	5/28/14	1035	X				X					6	X	X	← QA/QC
mw-6	5/29/14	1115	X				X					2	X	X	
mw-7	5/28/14	1140	X				X					2	X	X	sample not rec'd @ ELLE until 6/2/14
mw-8	5/28/14	1515	X				X					2	X	X	
mw-9	5/28/14	1408	X				X					2	X	X	
mw-105	5/28/14	1546	X				X					2	X	X	

7 Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: Ex. 4 CBI @tenbears.us.

8 Data Package Options (circle if required)

Type I (Validation/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) TX TRRP-13

Type IV (CLP SOW) MA MCP CT RCP

HSCA DATA PACKAGE

Relinquished by	Date	Time	Received by	Date	Time
Ex. 4 CBI	5/22/14	1250	Ex. 4 CBI	5/23/14	1000 hrs
Ex. 4 CBI	5/30/14	1405	Ex. 4 CBI	5/30	1405
Ex. 4 CBI	5/30/14	1530	Ex. 4 CBI		
			Ex. 4 CBI	5/30/14	1830

EDD Required? Yes No
If yes, format: _____

Site-specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 2.6 °C

Environmental Analysis Request/Chain of Custody

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2082

Acct. # 10855 For Eurofins Lancaster Laboratories Environmental use only Group # 1478389 Sample # 1483230-46

Instructions on reverse side correspond with circled numbers.

COC # 352758

1 Client Information

Client: TEN BEARS ENVIRONMENTAL

Acct. #: 10855

Project Name/#: 12-1027.C

PWSID #:

Project I: Ex. 4 CBI

P.O. #:

Sampler: BE

Quote #:

Name of state where samples were collected: DE

2 Sample Identification

Sample Identification	Collected Date	Collected Time	3 Grab	Composite	4 Matrix: Soil ☐ Sediment ☐	Water: Potable ☑ Ground ☑	Water: NPDES ☐ Surface ☐	Other:	Total # of Containers	5 Analysis Requested: Total Chromium	Cyanide
MW-11	5/29/14	1015	X			X			2	X	X
MW-12	5/29/14	0948	X			X			2	X	X
DW-1	5/28/14	1438	X			X			2	X	X
DW-2	5/28/14	1328	X			X			2	X	X
DOMESTIC WELL	5/29/14	1205	X			✓			2	X	X
MW-10D	5/28/14	1608	X			X			2	X	X

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

6 Remarks

7 Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address Ex. 4 CBI @tenbears.us

8 Data Package Options (circle if required)

Type I (Validation/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) TX TRRP-13

Type IV (CLP SOW) MA MCP CT RCP

HSCA DATA PACKAGE

Relinquished by	Date	Time
Ex. 4 CBI	5/30/14	1405
	5/30/14	1830

Relinquished by	Date	Time
Ex. 4 CBI	5/23/14	1000 HS
	5/30	1405
	5/30/14	1830

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 2.6 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0713

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

June 13, 2014

Project: 12-1027.C

Submittal Date: 06/03/2014
Group Number: 1478978
SDG: TBG57
PO Number: 12-1027.C
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
MW-1 Grab Groundwater	7485896
MW-7 Grab Groundwater	7485897

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

Respectfully Submitted,

Ex. 4 CBI
Senior Specialist
(717) 556 Ex. 6 Personal Privacy (PP)

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Analysis Report

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Sample Description: MW-1 Grab Groundwater
12-1027.C

LL Sample # WW 7485896
LL Group # 1478978
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 10:45 by BE

Submitted: 06/03/2014 17:10
Reported: 06/13/2014 08:33

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

10271 SDG#: TBG57-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0016	1
Wet Chemistry	**SW-846 9012A**		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141611848005	06/12/2014 20:15	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141611848005	06/12/2014 10:16		1
08255	Total Cyanide (water)	SW-846 9012A	1	14159117101A	06/08/2014 19:09		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14159117101A	06/08/2014 13:15		1

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Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7 Grab Groundwater
12-1027.C

LL Sample # WW 7485897
LL Group # 1478978
Account # 10855

Project Name: 12-1027.C

Collected: 05/29/2014 11:40 by BE

Submitted: 06/03/2014 17:10
Reported: 06/13/2014 08:33

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

10277 SDG#: TBG57-02*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.129	0.0016	1
Wet Chemistry		**SW-846 9012A**	mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	141611848005	06/12/2014 20:19	Ex. 4 CBI	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	141611848005	06/12/2014 10:16		1
08255	Total Cyanide (water)	SW-846 9012A	1	14159117101B	06/08/2014 19:10		1
08256	Cyanide Water Distillation	SW-846 9012A	1	14159117101B	06/08/2014 13:15		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 06/13/14 at 08:33 AM

Group Number: 1478978

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 141611848005	Sample number(s): 7485896-7485897							
Chromium	N.D.	0.0016	mg/l	102		90-110		
Batch number: 14159117101A	Sample number(s): 7485896							
Total Cyanide (water)	N.D.	0.0050	mg/l	104		90-110		
Batch number: 14159117101B	Sample number(s): 7485897							
Total Cyanide (water)	N.D.	0.0050	mg/l	104		90-110		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 141611848005	Sample number(s): 7485896-7485897 UNSPK: P487317 BKG: P487317								
Chromium	101	100	76-120	1	20	0.0036 J	0.0037 J	3 (1)	20
Batch number: 14159117101A	Sample number(s): 7485896 UNSPK: P483295 BKG: P483295								
Total Cyanide (water)	101		43-137			N.D.	N.D.	0 (1)	20
Batch number: 14159117101B	Sample number(s): 7485897 UNSPK: 7485897 BKG: 7485897								
Total Cyanide (water)	94		43-137			N.D.	N.D.	0 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories

For Lancaster Laboratories use only

Acct. # 10855 Group # 1478978 Sample # 7485896-97

COC # 310762

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: Ten Bears Env. Acct. #: 10855
Project Name/#: 12-1027.C PWSID #:
Project Mana Ex. 4 CBI P.O.#:
Sampler: Quote #:
Name of state where samples were collected: DE

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(2) (3) (4) (5)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Sediment	Water (Potable / NPDES / Ground / Surface)	Other:	Total # of Containers	Total Cyanides (N/S)	Total CN (B)								Remarks
MW-1	5/29/14	1045	X				X		2	X	X								forgot to put in other cooler
MW-7	5/29/14	1140	X				X		2	X	X								"

(6) Temperature of samples upon receipt (if requested)

(7) **Turnaround Time Requested** (TAT) (please circle): Standard Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone E-mail
Phone #:
E-mail address: Ex. 4 CBI @tenbears.us

(8) **Data Package Options** (please circle if required)
Type I (Validation/non-CLP) MA MCP CT RCP
Type III (Reduced non-CLP)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13

EDD Required? Yes No

Site-specific QC (MS/MSD/Dup)? Yes No
(if yes, indicate QC sample and submit triplicate sample volume)

Ex. 4 CBI

	Date	Time
	6/2/14	1300
	6/3/14	1425
	6/3/14	1710
Relinquished by:	Date	Time
Relinquished by:	Date	Time

Ex. 4 CBI

(9)

Date	Time
6/2/14	1300
6/3/14	1425
6/3/14	1710

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 717-656-2300
The white copy should accompany samples to Lancaster Laboratories. The yellow copy should be retained by the client.

Issued by Dept. 40 Management
7044.01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Data Qualifiers:

C – result confirmed by reanalysis.

J - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	**B**	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	**E**	Estimated due to interference
C	Pesticide result confirmed by GC/MS	**M**	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	**N**	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	**S**	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	**U**	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	**W**	Post digestion spike out of control limits
U	Compound was not detected	*****	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	**+**	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX F

Phase IV (2015) RI Information

F-1 Phase IV Monitor Well /Soil Boring Logs, DNREC Well Completion Reports

F-2 Phase IV Groundwater Sample Collection Field Sheets (May 2015)

F-3 Groundwater Sample Laboratory Summary Data Package (May 2015)

Boring MW-13

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Property	Town of Blades, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	4/30/2015
Northeast Regional Probing, Inc.	Ex. 4 CBI	**Date Finished:**	4/30/2015
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler		BE

Weather	Surface Conditions	Surface Elevation	Datum
Partly sunny, 60s	Grass	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.4	2.7	Dark brown fine to medium SAND, some to little silt	0.0
			0.4			Tan, light orange, brown fine to medium SAND, little silt	0.0
2	4	8			2.8	SAME, soil color transitions to light tan at approximately 5.7 feet	0.0
3	8	12			3.1	SAME, soil color alternates with depth, tan, light gray, light orange, brown	0.0
4	12	16		...	3.0	SAME	0.0

Notes

1. The boring was terminated at a depth of approximately 16.0 feet below the ground surface.
2. Groundwater was encountered in the boring at a depth of approximately 8.5 feet below the ground surface.
3. A monitoring well was constructed in the boring using 1-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 6.0 to 16.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.0 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with an approximately 2.5 foot well stickup.

* PID = Photo-ionization detector, readings are in deflection units above background.

Boring MW-14

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Property	Town of Blades, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	4/30/2015
Northeast Regional Probing, Inc.	Ex. 4 CBI	**Date Finished:**	4/30/2015
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler		BE

Weather	Surface Conditions	Surface Elevation	Datum
Partly sunny, 60s	Grass	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.2	2.8	Crushed gravel and fine to medium sand	0.0
			0.2			Brown fine to medium SAND, little silt	0.0
2	4	8			3.0	SAME, intermittent color changes, tan, orange, light gray, tan	0.0
3	8	12		9.3	2.8	SAME	0.0
4	12	15		12.6	3.3	SAME	0.0
			12.6	13.3		Tan fine to coarse SAND, trace gravel, trace silt	0.0
			13.3	14.2		Tan fine to medium SAND, trace gravel, trace silt	0.0
			14.2	14.9		Tan fine to coarse SAND, trace gravel, trace silt	0.0
			14.9	...		Tan fine to medium SAND, trace silt	0.0

Notes

1. The boring was terminated at a depth of approximately 15.0 feet below the ground surface.
2. Groundwater was encountered in the boring at a depth of approximately 8.5 feet below the ground surface.
3. A monitoring well was constructed in the boring using 1-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 5.0 to 15.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.0 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with an approximately 2.5 foot well stickup.

* PID = Photo-ionization detector, readings are in deflection units above background.

TEN BEARS ENVIRONMENTAL, L.L.C
NEWARK, and MILTON, DE

Boring MW-15

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Property	Town of Blades, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	4/30/2015
Northeast Regional Probing, Inc.	Ex. 4 CBI	**Date Finished:**	4/30/2015
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler		BE

Weather	Surface Conditions	Surface Elevation	Datum
Partly sunny, 60s	Vegetation	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.7	2.3	Dark brown fine to medium SAND, little silt	0.0
			0.7			Light brown, tan fine to medium SAND, littl to trace silt	0.0
2	4	8			2.9	SAME, soil color transitions to light grayish tan at approximately 6.0 feet, wet at approximately 7.0 feet	0.0
3	8	12			3.4	SAME, wet, little coarse sand below approximately 11.7 feet	0.0
4	12	16			4.0	SAME, light brown, tan fine to medium SAND, some coarse sand, trace gravel	0.0

Notes

1. The boring was terminated at a depth of approximately 16 feet below the ground surface.
2. Groundwater was encountered in the boring at a depth of approximately 7.0 feet below the ground surface.
3. A monitoring well was constructed in the boring using 1-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 6.0 to 16.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.0 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with an approximately 2.5 foot well stickup.

* PID = Photo-ionization detector, readings are in deflection units above background.

Boring DMW-3

Ten Bears Environmental

SOIL-BORING DESCRIPTIVE LOG

Project Name	Project Location		Project Number
Procino Property	Town of Blades, Delaware		11-1027.C
Drilling Agency	**Driller**	**Date Started:**	4/30/2015
Northeast Regional Probing, Inc.	Ex. 4 CBI	**Date Finished:**	4/30/2015
Drilling Equipment	**Drilling Procedures**		**Logged by:**
Track mounted Geoprobe	1.5-inch diameter, 4-foot long continuous dualcore sampler		BE

Weather	Surface Conditions	Surface Elevation	Datum
Partly sunny, 60s	Vegetation	NA	NA

Spl. #	Sample Depth (ft) From	Sample Depth (ft) To	Strata Depth (ft) From	Strata Depth (ft) To	Rec'y (ft)	Sample Description	PID*
1	0	4	0.0	0.7	2.3	Dark brown fine to medium SAND, little silt	0.0
			0.7			Light brown, tan fine to medium SAND, littl to trace silt	0.0
2	4	8			2.9	SAME, soil color transitions to light grayish tan at approximately	0.0
						6.0 feet, wet at approximately 7.0 feet	
3	8	12			3.4	SAME, wet, little coarse sand below approximately 11.7 feet	0.0
4	12	16			4.0	SAME, light brown, tan fine to medium SAND, some coarse	0.0
						sand, trace gravel	
5	16	20		17.3	4.0	SAME	0.0
			17.3	17.6		Tan fine to coarse SAND and gravel	0.0
			17.6			Tan fine to coarse SAND, little to some gravel, soil color	0.0
				...		transitions to tan, orange at approximately 19.4 feet	
		below 20 feet				Driller pushed rods to depth of refusal.	
			24.0	33.5		Resisted penetration, assumed cohesive (SILT) layer	
			33.5	34.0		fine SAND on base of rods when retreived.	0.0

Notes

1. The boring was terminated at a depth of approximately 34.0 feet below the ground surface.
2. Groundwater was encountered in the boring at a depth of approximately 7.0 feet below the ground surface.
3. Soil samples below a depth of 20 feet were saturated and not able to be recovered using the sampler.
4. A monitoring well was constructed in the boring using 1-inch nominal diameter PVC piping and No. 10 slot well screen. The screen was pre-packed with 20/40 filter sand held in place with No. 10 stainless steel mesh. The screened interval was set at a depth of approximately 24.0 to 34.0 feet below the ground surface. The annular space of the borehole was filled with No. 20 filter sand to a depth of approximately 3.0 feet below the ground surface. The remainder of the hole was filled with granular bentonite. The well was finished with an approximately 2.5 foot well stickup.

* PID = Photo-ionization detector, readings are in deflection units above background.

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

748152

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 249873 Local ID: MW-13

Tax Map/Parcel #: Ex. 6 Personal Privacy (PP)

Property Owner:

Water Well Contractor: NE Cry Perkins WC Lic #: 4223

Well Driller In Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driver ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): DPT

Total Depth Of Excavation (Feet BGS): 16

Construction Date: 4/30/15

CASING INSTALLATION:

	INNER	OUTER (1)	(2)	(3)
Casing Top (Inches AGS):	-3			
Casing Bottom (Feet BGS):	6			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2

AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS):	6
Screen Bottom (Feet BGS):	16
Screen Diameter (Inches):	3/4
Screen Material:	PVC
Screen Slot Size (1000 of an Inch):	10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify) monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: Horsepower:

Rated Capacity: (GPM) Pump Intake Setting(ft. BGS):

Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump

Pump Installed By: ☐ Others Date:

Gravel Pack: From: 4 Feet To: 16 Feet

Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug

Other: From: 0 Feet To: 4 Feet

Type Of Non-Grout Backfill Of Well Annulus: N/A

From: Feet To: Feet

Static Water Level: 8.5 Feet ☑ Below ☐ Above Ground Surface

Pumping Water Level: Feet On (Date): 4/30/15

After: Hours Pumping Rate: GPM

Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:

Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☑ Pad Mount
☐ Other - Specify:

Well Head Completed: 3 Inches ☐ Above ☑ Below Ground Surface

Was The Well Tag Attached In Accordance With Current Regulations?

☑ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must* note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).**

See Attached

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS

Ex. 6 Personal Privacy (PP)

Signature - Well Driller in Charge of Well Construction

4234 — Well Driller License #

5/25/15 — Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

7482675

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 249872 Local ID: MW-16
Tax Map/Parcel #: 1-32-01.17-0026.03
Property Owner: HMS Blades, Ltd.
Water Well Contractor: _____ WC Lic #: _____
Well Driller In Charge During Construction: _____

DRILLING / EXCAVATION METHOD

☐Auger ☐Bored ☐Mud Rotary
☐Driver ☐Jetted ☐Air Rotary
☐Cable Tool ☐Washed ☐Reverse Rotary
☒Other (Specify): DPT

Total Depth Of Excavation (Feet BGS): 20
Construction Date: 4/30/15

CASING INSTALLATION:

	INNER	OUTER (1)	OUTER (2)	OUTER (3)
Casing Top (Inches AGS):	18			
Casing Bottom (Feet BGS):	6			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS): 6
Screen Bottom (Feet BGS): 16
Screen Diameter (Inches): 3/4
Screen Material: PVC
Screen Slot Size (1000 of an Inch): 10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☒ Other (Specify) Monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: _____ Horsepower: _____
Rated Capacity: _____ (GPM) Pump Intake Setting(ft. BGS): _____
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: _____ ☐ Others Date: _____

Gravel Pack: From: 4 Feet To: 16 Feet
Grout Type: ☐ Bentonite Clay ☐ Cement ☒ Bentonite Clay Plug
Other: _____ From: 0 Feet To: 4 Feet
Type Of Non-Grout Backfill Of Well Annulus: N/A
From: _____ Feet To: _____ Feet
Static Water Level: 7 Feet ☒ Below ☐ Above Ground Surface
Pumping Water Level: _____ Feet On (Date): 4/30/15
After: _____ Hours Pumping Rate: _____ GPM
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other: _____
Was A Geophysical Log Taken? ☒ Yes ☐ No If "Yes", By: BE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☒ Other - Specify: PVC Stick-up
Well Head Completed: 18 Inches ☒ Above ☐ Below Ground Surface
Was The Well Tag Attached In Accordance With Current Regulations?
☒ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must* note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines** (included suitable plot plan if available).

See Attached

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS

Ex. 4 CBI

Signature - Well Driller in Charge of Well Construction

4234 5/25/15
Well Driller License # Date

White - DNREC • Canary - Contractor • Pink - Owner Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

742675

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 249871 Local ID: MW-15
Tax Map/Parcel #: 1-32-01.19-0026.03
Property Owner: HMS Blades, Ltd.
Water Well Contractor: NE Log Probing WC Lic #: 4223
Well Driller In Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driver ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): DPT

Total Depth Of Excavation (Feet BGS): 15
Construction Date: 4/21/15

CASING INSTALLATION:

	INNER	OUTER (1)	(2)	(3)
Casing Top (Inches AGS):	-3			
Casing Bottom (Feet BGS):	6			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS):	6
Screen Bottom (Feet BGS):	16
Screen Diameter (Inches):	3/4
Screen Material:	PVC
Screen Slot Size (1000 of an Inch):	10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify) monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: _____ Horsepower: _____
Rated Capacity: _____ (GPM) Pump Intake Setting(ft. BGS): _____
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: _____ ☐ Others Date: _____

Gravel Pack: From: 4 Feet To: 16 Feet
Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug
Other: _____ From: 0 Feet To: 4 Feet
Type Of Non-Grout Backfill Of Well Annulus: N/A
From: _____ Feet To: _____ Feet
Static Water Level: 8.5 Feet ☑ Below ☐ Above Ground Surface
Pumping Water Level: _____ Feet On (Date): 4/30/15
After: _____ Hours Pumping Rate: _____ GPM
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other: _____
Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☑ Pad Mount
☐ Other - Specify: _____
Well Head Completed: 3 Inches ☐ Above ☑ Below Ground Surface
Was The Well Tag Attached In Accordance With Current Regulations?
☑ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must*** note changes such as distances from well to house, property lines, nearest road, **and all nearby septic systems and central sewer lines** (included suitable plot plan if available).

Log Attached

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS

Ex. 4 CBI

Signature - Well Driller In Charge of Well Construction

4234 — Well Driller License #
5/25/15 — Date

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/07/01/10 - CRR 1

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

747738

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 249870 Local ID: DMW-3
Tax Map/Parcel #: 1-32-01.19-0026.03
Property Owner: HMS Blades Ltd
Water Well Contractor: NE Eng Probing WC Lic #: 4223
Well Driller In Charge During Construction: Ex. 4 CBI

DRILLING / EXCAVATION METHOD

☐ Auger ☐ Bored ☐ Mud Rotary
☐ Driver ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☑ Other (Specify): DPT

Total Depth Of Excavation (Feet BGS): 20
Construction Date: 4/30/15

CASING INSTALLATION:

	INNER	OUTER (1)	(2)	(3)
Casing Top (Inches AGS):	18			
Casing Bottom (Feet BGS):	24			
Casing Diameter (Inches):	3/4			
Casing Material:	PVC			

Gravel Pack Size (#): 2
AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS): 24
Screen Bottom (Feet BGS): 34
Screen Diameter (Inches): 3/4
Screen Material: PVC
Screen Slot Size (1000 of an inch): 10

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☑ Other (Specify) monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: Horsepower:
Rated Capacity: (GPM) Pump Intake Setting (ft. BGS):
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: ☐ Others Date:

Gravel Pack: From: 24 Feet To: 34 Feet
Grout Type: ☐ Bentonite Clay ☐ Cement ☑ Bentonite Clay Plug
Other: From: 0 Feet To: 24 Feet
Type Of Non-Grout Backfill Of Well Annulus: N/A
From: Feet To: Feet
Static Water Level: 7 Feet ☑ Below ☐ Above Ground Surface
Pumping Water Level: Feet On (Date): 4/30/15
After: Hours Pumping Rate: GPM
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:
Was A Geophysical Log Taken? ☑ Yes ☐ No If "Yes", By: BE

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☐ Pad Mount
☑ Other - Specify: PVC Stick-up
Well Head Completed: 18 Inches ☑ Above ☐ Below Ground Surface
Was The Well Tag Attached In Accordance With Current Regulations?
☑ YES ☐ NO If "NO", Please Explain:

Site Plan - **If different from original application, *must*** note changes such as distances from well to house, property lines, nearest road, **and all nearby septic systems and central sewer lines** (included suitable plot plan if available).

See Attached

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS

Ex. 4 CBI

Signature - Well Driller In Charge of Well Construction

4-34 5/25/15
Well Driller License # Date

White - DNREC • *Canary - Contractor* • *Pink - Owner* Doc No. 40-08/07/01/10 - CRR 1

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-6 (DNREC WSS Well Permit No. 235311)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 17.7 feet	9.31 feet	8.39 feet	± 0.34 gallons	5/14/2015 0814 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1036 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1042	6.18	0.128	43.4	4.80	15.98	115
1045	6.20	0.121	31.4	3.17	15.70	103
1048	6.19	0.118	28.7	2.55	15.73	99
1051	6.17	0.114	22.4	2.31	15.70	97

Sample collected for laboratory analysis at 1052 hrs.

Laboratory analysis requested: Total chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 13.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-7 (DNREC WSS Well Permit No. 238779)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 29.47 feet	9.19 feet	20.28 feet	± 0.5 gallons	5/14/2015 0814 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 0957 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1000	5.95	0.123	95.0	7.60	16.51	228
1003	5.88	0.143	36.7	6.58	15.91	238
1006	5.77	0.155	14.7	5.81	15.87	243
1011	5.77	0.155	14.0	5.51	15.76	252
1016	5.73	0.157	11.5	5.45	15.78	256
1019	5.73	0.156	11.4	5.42	15.77	256

Sample collected for laboratory analysis at 1020hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 25.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-8 (DNREC WSS Well Permit No. 238780)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.04 feet	6.58 feet	17.46 feet	± 0.4 gallons	5/14/2015 0840 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1137 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1140	6.34	0.192	93.5	6.50	17.20	218
1143	6.30	0.162	58.1	5.83	16.57	225
1146	6.29	0.156	68.8	5.62	16.37	230
1150	6.29	0.154	50.0	5.58	16.20	232
1153	6.29	0.152	46.0	5.57	16.19	235

Sample collected for laboratory analysis at 1155 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 20.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-10 (DNREC WSS Well Permit No. 243228)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 24.0 feet	8.11 feet	15.89 feet	± 0.4 gallons	5/14/2015 0848 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 0913 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
0917	5.90	0.151	88.8	8.13	14.80	211
0920	6.15	0.162	118	5.86	14.16	225
0923	6.20	0.158	57.6	5.86	14.12	222
0926	6.24	0.150	58.8	5.05	14.15	223
0930	6.24	0.147	15.7	5.01	14.16	225

Sample collected for laboratory analysis at 0933 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 19.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-11 (DNREC WSS Well Permit No. 243226)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 26.2 feet	8.37 feet	17.83 feet	± 0.41 gallons	5/14/2015 0852 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1205 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1209	6.19	0.224	798	5.50	15.69	241
1212	6.20	0.222	3.98	4.16	15.05	237
1215	6.21	0.225	71.9	3.92	14.08	236
1218	6.17	0.221	34.4	3.82	14.67	237
1222	6.17	0.221	30.7	3.80	14.66	238

Sample collected for laboratory analysis at 1225 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 21.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-13 (DNREC-WSS Permit No. 249873)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 16.0 feet	9.19 feet	9.81 feet	0.16 gallons	5/14/2015 0812 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1106 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1108	6.05	0.077	78.3	8.63	19.70	167
1111	5.99	0.080	70.1	7.84	18.23	195
1114	5.95	0.081	68.5	7.56	17.83	211
1114	5.90	0.084	64.9	7.58	17.46	223
1120	5.89	0.090	54.1	7.50	17.29	236

Sample collected for laboratory analysis at 1123 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 11.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-14 (DNREC-WSS Permit No. 249872)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 15.0 feet	8.98 feet	6.02 feet	± 0.14 gallons	5/14/2015 0902 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1406 hrs.
TOTAL VOLUME PURGED: Approximately 1.5 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1410	5.96	0.205	335	4.30	16.26	253
1415	6.69	0.203	493	3.20	15.14	182
1420	6.70	0.192	214	3.46	15.09	180
1423	6.71	0.189	105	3.76	15.07	182
1426	6.71	0.188	54.5	3.73	15.01	188

Sample collected for laboratory analysis at 1428 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 10.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: MW-15 (DNREC-WSS Permit No. 249871)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 16.0 feet	10.27 feet	5.73 feet	± 0.13 gallons	5/14/2015 0900 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1322 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1327	5.98	0.084	169	7.40	16.30	188
1333	6.22	0.094	176	6.78	15.25	204
1336	6.23	0.101	163	6.44	15.11	210
1340	6.19	0.105	149	6.38	14.95	218
1343	6.13	0.107	76.0	6.15	14.88	224
1346	6.06	0.108	84.0	6.30	14.74	230
1349	6.00	0.109	39.4	6.15	14.84	235
1353	6.00	0.107	20.2	6.14	14.84	237

Sample collected for laboratory analysis at 1355 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 11.0 feet below the top of the well casing.

TEN BEARS ENVIRONMENTAL, LLC
NEWARK and MILTON, DELAWARE

GROUNDWATER SAMPLING FIELD SHEET

Project Name: Procino Plating Property **Project Number:** 12-1027.C

WELL ID: DW-3 (DNREC-WSS Permit No. 249870)

WELL DEPTH	DEPTH TO WATER	HEIGHT OF WATER	VOLUME IN WELL	DATE / TIME
± 34.0 feet	12.41 feet	21.59 feet	± 0.5 gallons	5/14/2015 0854 hrs.

PURGE TECHNIQUE: Low-flow protocol
PURGING EQUIPMENT: Geotech peristaltic pump with single-use plastic tubing
PURGE RATE: Approximately 300 - 400 ml/min
PURGE START TIME: 1322 hrs.
TOTAL VOLUME PURGED: Approximately 2.0 gallons

Water Quality Meter Make / Model: Horiba Water Checker Model U-52 with flow-through cell

TIME	pH	CONDUCTIVITY	TURBIDITY	DISSOLVED O_2	TEMP	ORP
hrs	pH units	mS/cm	NTU	mg/l	°C	mV
1252	5.60	0.177	0.0 -	1.03	16.12	150
1255	5.61	0.182	0.0 -	0.89	16.08	150
1300	5.63	0.190	682	0.74	15.86	141
1305	5.60	0.186	400	0.60	15.92	130
1310	5.55	0.186	259	0.55	15.94	128
1313	5.42	0.186	191	0.49	15.90	128

Sample collected for laboratory analysis at 1315 hrs.

Laboratory analysis requested: Dissolved chromium

Bottles Filled: 250 ml HNO_3 (filtered) 1

Comments: Intake was set approximately 29.0 feet below the top of the well casing.

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

May 22, 2015

Project: 12-1027.C

Submittal Date: 05/15/2015
Group Number: 1561801
SDG: TBH03
PO Number: 12-1027.C
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
MW-6 Grab Water	7891615
MW-7 Grab Water	7891616
MW-7MS Grab Water	7891617
MW-7MSD Grab Water	7891618
MW-7DUP Grab Water	7891619
MW-8 Grab Water	7891620
MW-10 Grab Water	7891621
MW-11 Grab Water	7891622
MW-13 Grab Water	7891623
MW-14 Grab Water	7891624
MW-15 Grab Water	7891625
MW-20 Grab Water	7891626
DMW-3 Grab Water	7891627

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

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Lancaster Laboratories
Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Ex. 4 CBI

Senior Specialist

(717) 556- Ex. 6 Personal Privacy (PP)

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Lancaster Laboratories
Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-6 Grab Water
12-1027.C

LL Sample # WW 7891615
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 10:52 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02706 SDG#: TBH03-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.115	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:38	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Lancaster Laboratories
Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7 Grab Water
12-1027.C

LL Sample # WW 7891616
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 10:20 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02707 SDG#: TBH03-02BKG

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0274	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:21	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Lancaster Laboratories
Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7MS Grab Water
12-1027.C

LL Sample # WW 7891617
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 10:20 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02707 SDG#: TBH03-02MS

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.222	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:29	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Lancaster Laboratories
Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7MSD Grab Water
12-1027.C

LL Sample # WW 7891618
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 10:20 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02707 SDG#: TBH03-02MSD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.225	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:32	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-7DUP Grab Water
12-1027.C

LL Sample # WW 7891619
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 10:20 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02707 SDG#: TBH03-02DUP

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0279	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:26	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-8 Grab Water
12-1027.C

LL Sample # WW 7891620
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 11:55 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02708 SDG#: TBH03-03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:41	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-10 Grab Water
12-1027.C

LL Sample # WW 7891621
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 09:33 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02710 SDG#: TBH03-04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0850	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:49	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-11 Grab Water
12-1027.C

LL Sample # WW 7891622
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 12:25 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02711 SDG#: TBH03-05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0044 J	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:52	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-13 Grab Water
12-1027.C

LL Sample # WW 7891623
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 11:23 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02713 SDG#: TBH03-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0017 J	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:54	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-14 Grab Water
12-1027.C

LL Sample # WW 7891624
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 14:28 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02714 SDG#: TBH03-07

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved	**SW-846 6010B**		mg/l	mg/l	
07051	Chromium	7440-47-3	N.D.	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 00:57	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-15 Grab Water
12-1027.C

LL Sample # WW 7891625
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 13:55 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02715 SDG#: TBH03-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0129 J	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 01:00	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-20 Grab Water
12-1027.C

LL Sample # WW 7891626
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 09:38 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02720 SDG#: TBH03-09

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	mg/l	mg/l	
07051	Chromium	7440-47-3	0.0833	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 01:03	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: DMW-3 Grab Water
12-1027.C

LL Sample # WW 7891627
LL Group # 1561801
Account # 10855

Project Name: 12-1027.C

Collected: 05/14/2015 13:15 by BE

Submitted: 05/15/2015 18:30
Reported: 05/22/2015 00:10

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

02703 SDG#: TBH03-10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		**SW-846 6010B**	**mg/l**	**mg/l**	
07051	Chromium	7440-47-3	N.D.	0.0013	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07051	Chromium	SW-846 6010B	1	151391848001	05/21/2015 01:06	Ex. 4 CBI	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	151391848001	05/20/2015 06:59		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 05/22/2015 00:10

Group Number: 1561801

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 151391848001	Sample number(s): 7891615-7891627							
Chromium	N.D.	0.0013	mg/l	99		80-120		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 151391848001	Sample number(s): 7891615-7891627 UNSPK: 7891616 BKG: 7891616								
Chromium	97	99	75-125	1	20	0.0274	0.0279	2 (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

377324

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only
Acct. # 10855 Group # 1561801 Sample # 7891615-27
Instructions on reverse side correspond with circled numbers.

1 Client Information

Client: TEN BEARS ENVIRONMENTAL
Acct. #: 10855
Project Name/#: 12-027.C
PWSID #:
Project Mana Ex. 4 CBI
P.O. #:
Sampler: BE
Quote #:
Name of state where samples were collected: DE

4 Matrix: Soil ☐ Sediment ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

5 Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#: 171709

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

6 Remarks

2 Sample Identification	Collected Date	Collected Time	3 Grab	Composite	Total # of Containers	Dissolved Chromium	Remarks
mw-6	5/14/15	1052	X		1	X	* All Samples were Field Filtered
mw-7	5/14/15	1020	X		3	X	← QA/QC here
mw-8	5/14/15	1155	X		1	X	
mw-10	5/14/15	0955	X		1	X	
mw-11	5/14/15	1225	X		1	X	
mw-13	5/14/15	1123	X		1	X	
mw-14	5/14/15	1428	X		1	X	
mw-15	5/14/15	1355	X		1	X	
mw-20	5/14/15	0938	X		1	X	
DMW-3	5/14/15	1315	X		1	X	

7 Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:
E-mail address: Ex. 4 CBI @ tenbears-us.

8 Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

DE SOP & EDD

Relinquished by	Date	Time	Received by	Date	Time
Ex. 4 CBI	5/12/15	1408	Ex. 4 CBI	5/12/15	1000hrs
	5/15/15	1509		5/15/15	1509
	5/15/15	1830			
Relinquished by				5/15/15	1830

EDD Required? Yes No
If yes, format:
Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____
Temperature upon receipt 2.1 °C

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

APPENDIX G

July 2015 Interim Action- Soil Excavation –

G-1 Photographs
G-2 Soil Disposal Documents
G-3 Disposal Characterization Soil Laboratory Data Package

ENVIRITE OF PENNSYLVANIA, INC.
730 VOGELSONG ROAD
YORK CITY INDUSTRIAL PARK
YORK, PA 17404
PHONE (717) 846-1900

TICKET NUMBER 6397

DATE IN 0-00-2000
TIME OUT 8:00AM DATE OUT 8-03-2015

TRUCK ID 9700 COMMODITY - HAZ./RES. WASTE

62360 lb GROSS
33980 lb TARE
28380 lb NET
14.19 TONS

PROCINO PLATTING
901 SOUTH MARKET
BLADES, DE 19973
DED 9823625 43

WEIGHMASTER# 69054 / 74590 / 77470

CUSTOMER COPY

93724

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	[illegible]	1	[illegible]	C730 [illegible] 15

5. Generator's Name and Mailing Address: PROCINO PLASTIC INC, 911 SOUTH MARKET STREET, [illegible] DE 19973

Generator's Site Address (if different than mailing address):

Generator's Phone: [illegible]

6. Transporter 1 Company Name: [illegible] — U.S. EPA ID Number: [illegible]

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: [illegible] — U.S. EPA ID Number:

Facility's Phone: [illegible]

9. Waste Shipping Name and Description	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.
1. [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2.				
3.				
4.				

13. Special Handling Instructions and Additional Information

[illegible]

box 9720

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Michael P Procino — Signature: [signature] — Month 07 Day 24 Year 15

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: [illegible] — Signature: [signature] — Month 7 Day 24 Year 15

Transporter 2 Printed/Typed Name: [illegible] — Signature: [signature] — Month [illegible] Day [illegible] Year [illegible]

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number:

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: JAMES [illegible] — Signature: [signature] — Month 07 Day 30 Year 15

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

169-BLC-O 6 11977 (Rev. 8/09) TRANSPORTER #2

US ecology

Certificate of Disposal

This certificate is to verify that the wastes specified on the following manifest numbers have been properly managed in accordance with all local, state and federal regulations.

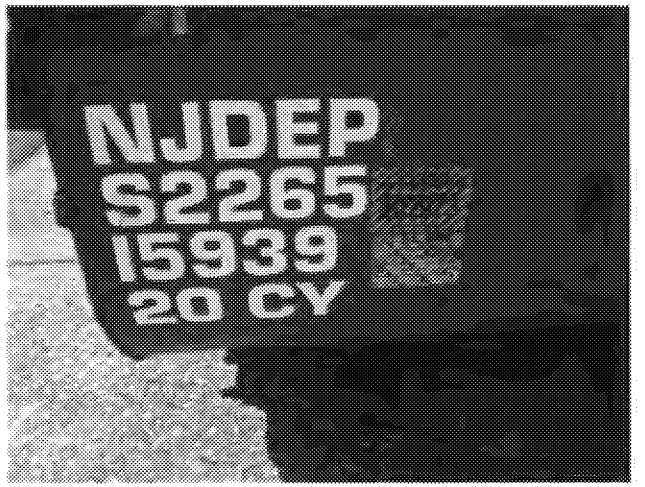
Facility: EQ Pennsylvania
730 Vogelsong Road
York, PA 17404
Phone: 717-846-1900
Fax: 717-854-6757

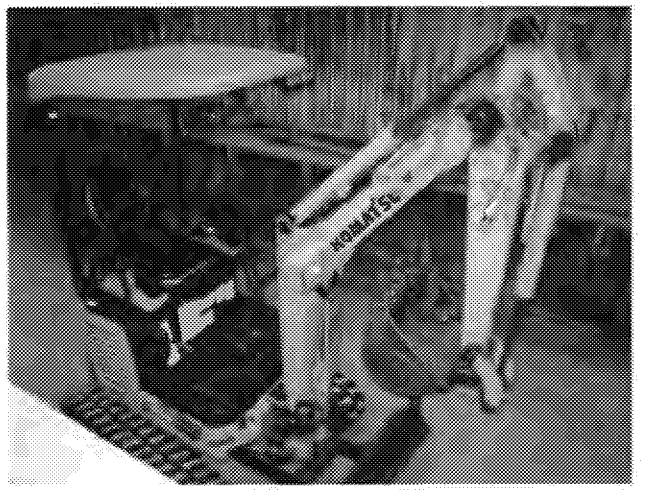
Generator: PROCINO PLATING (DED 982 362 543)

Manifest
07302015

I certify that the above [illegible] of my knowledge.

Authorized Signature: Ex. 4 CBI

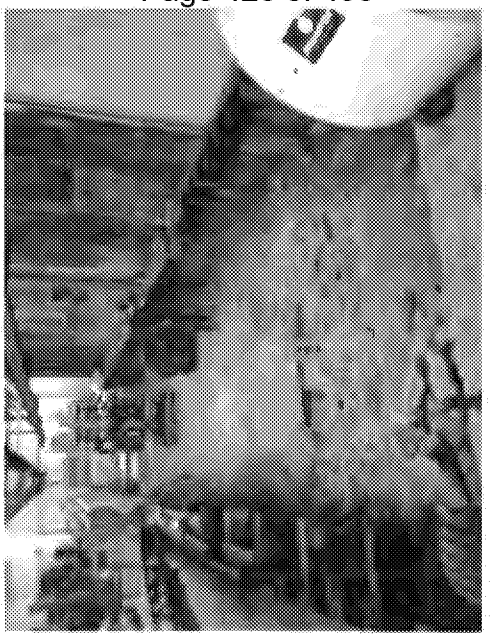


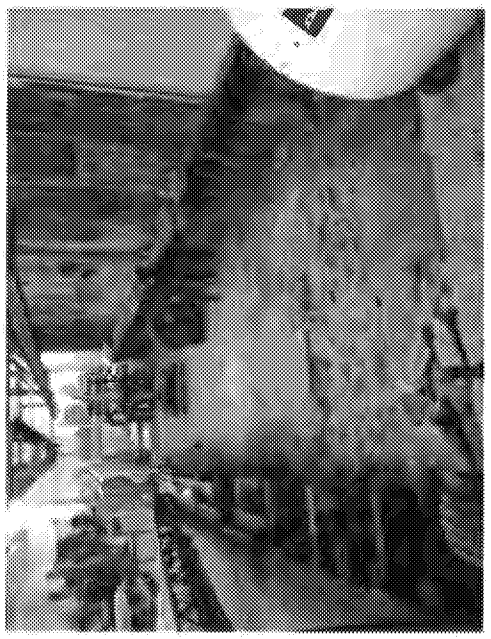


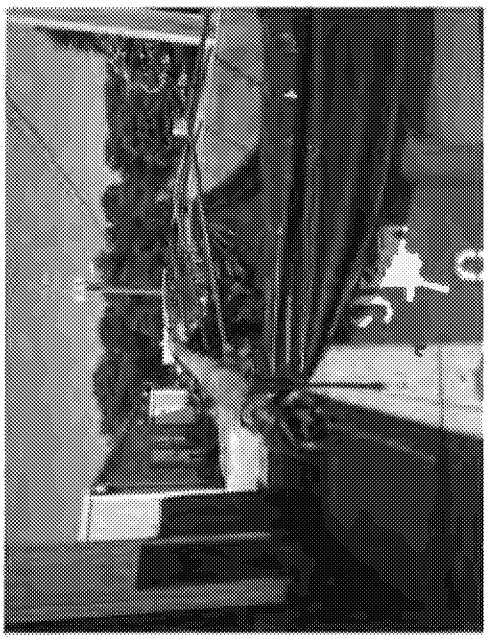
Interim Soil Removal Action, Procino Plating Site (DE-0344)

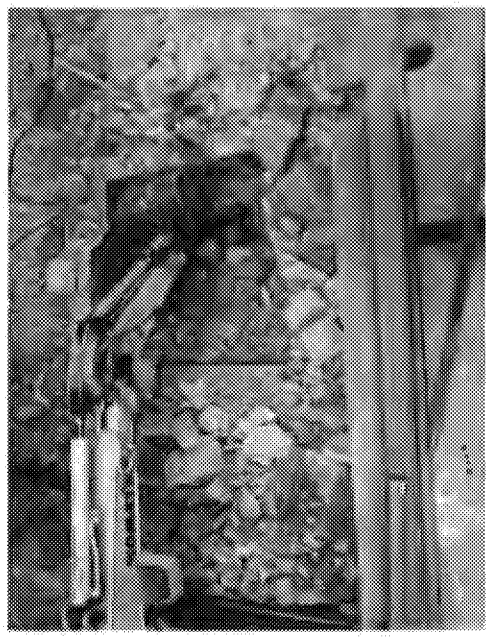
7/20/2015

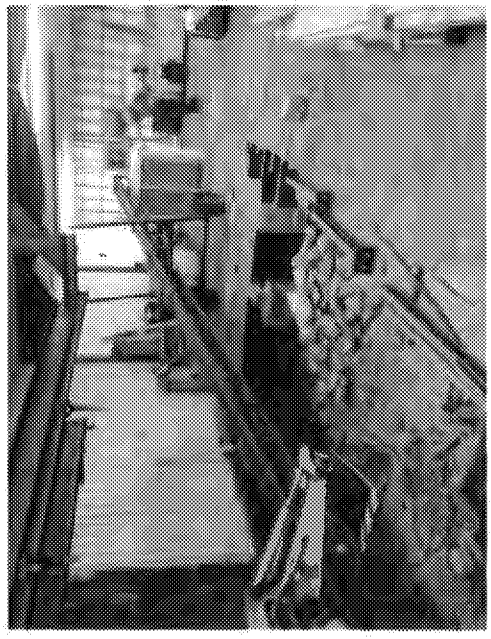
ED_005024_00000489-00424

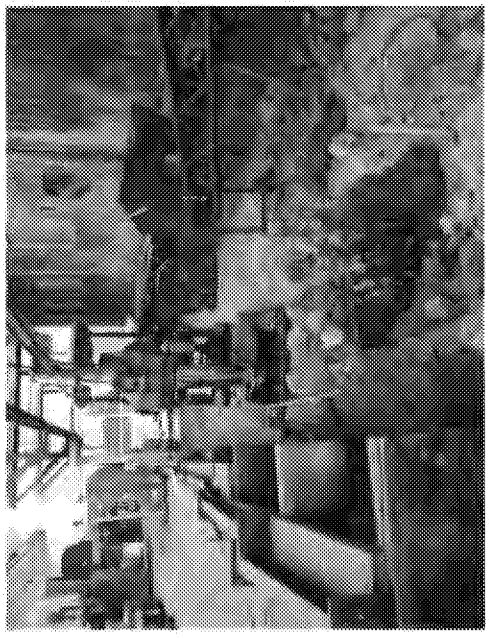


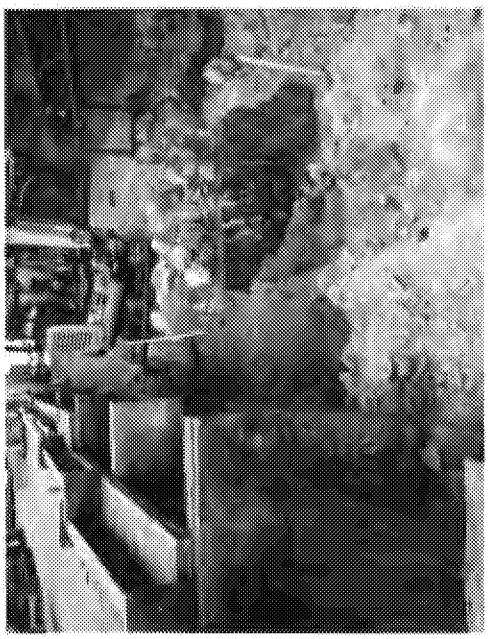












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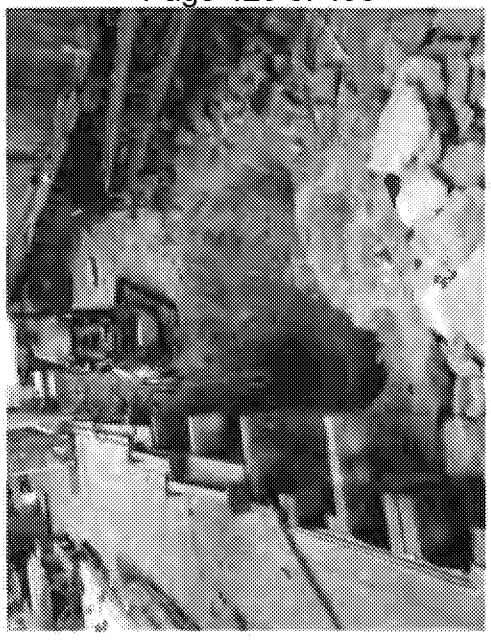
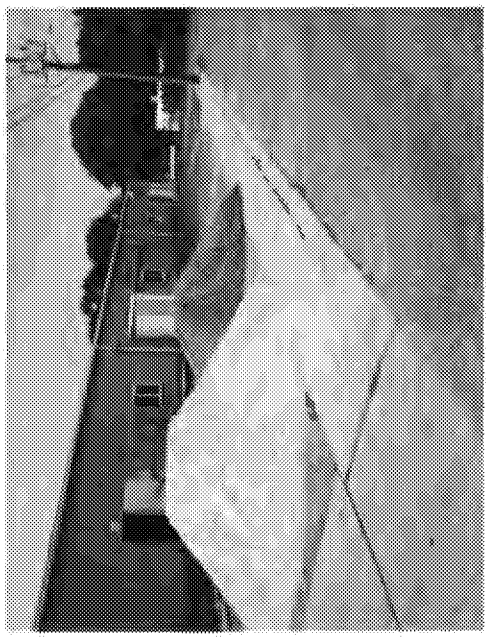
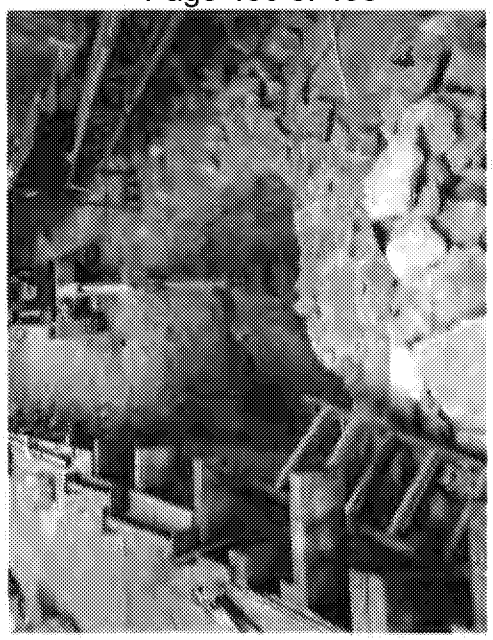
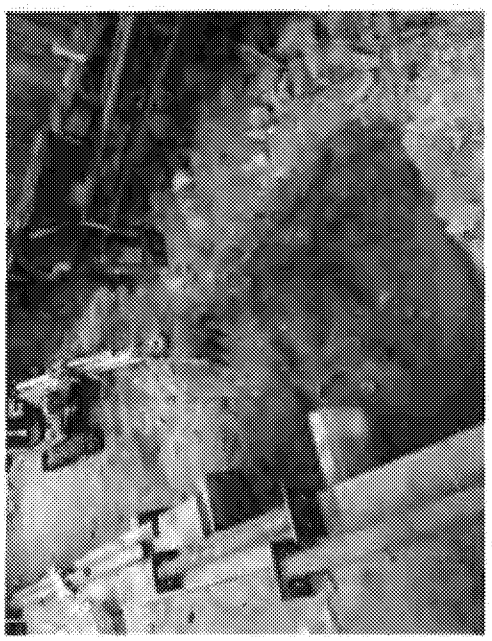
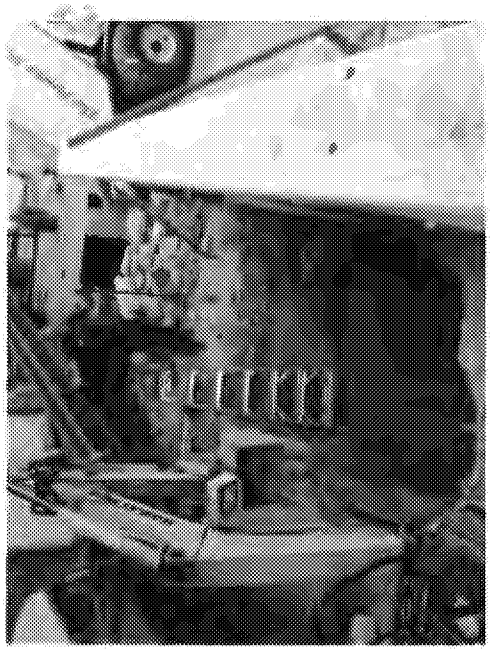
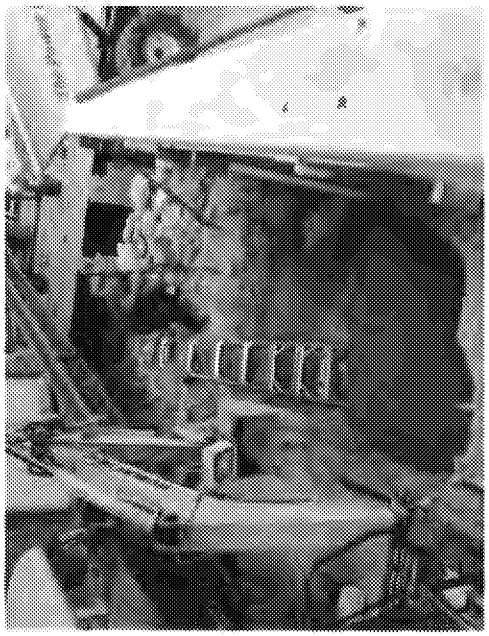
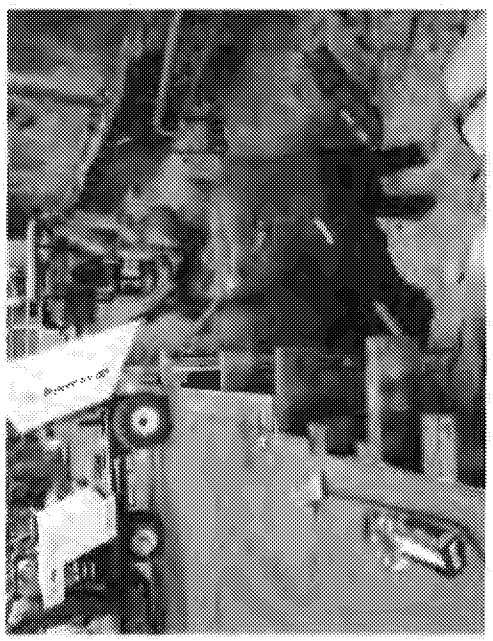


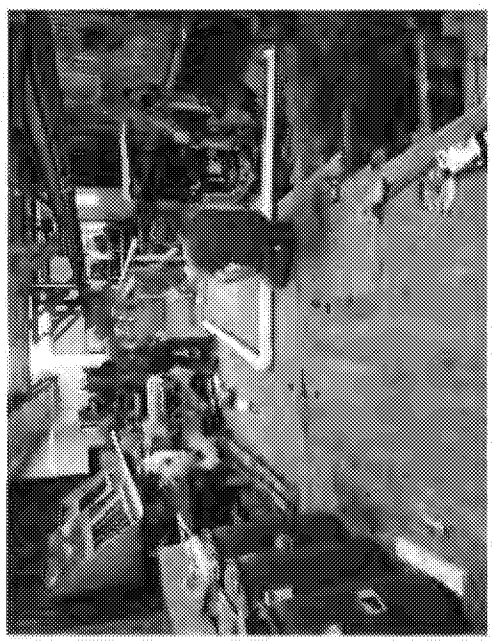




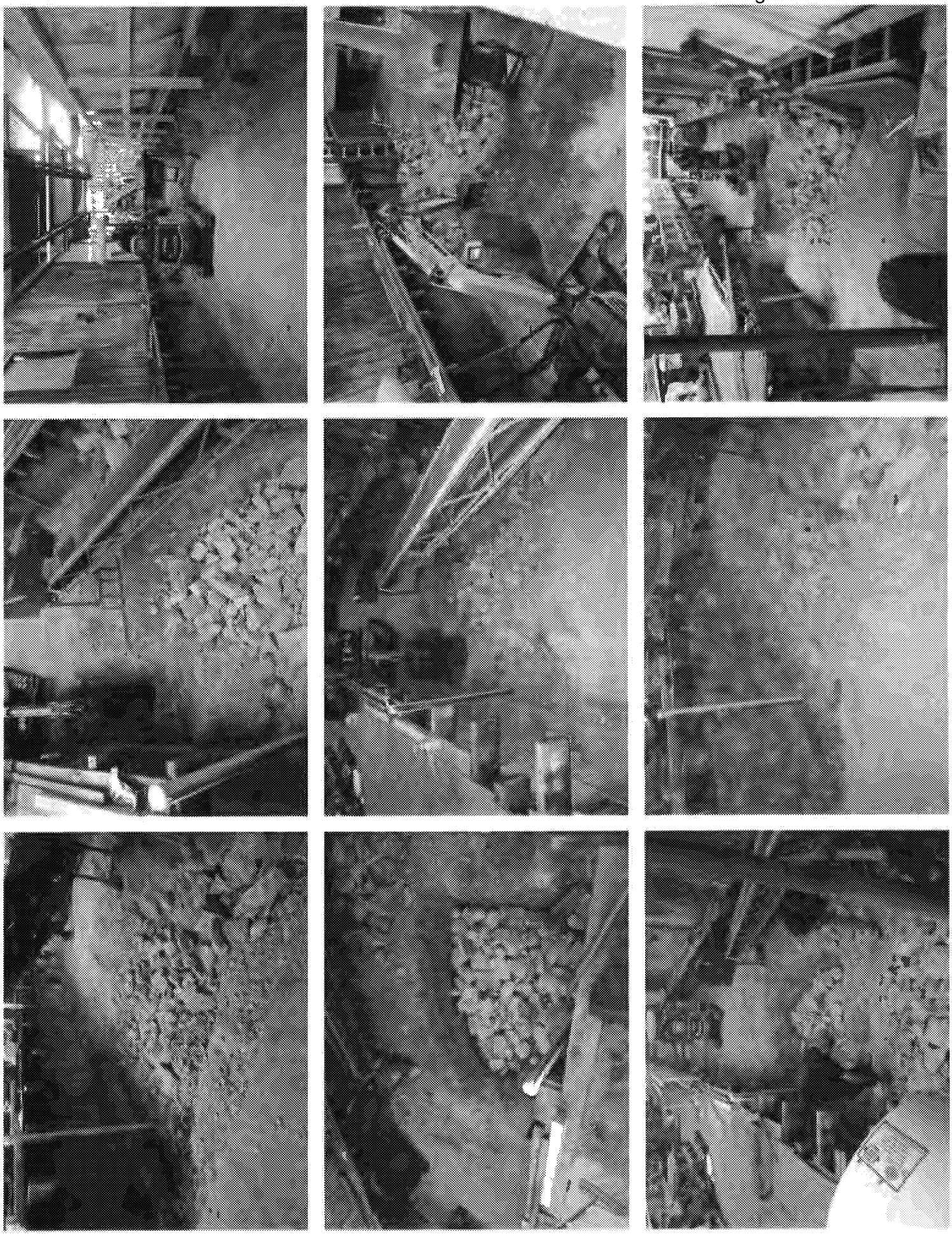


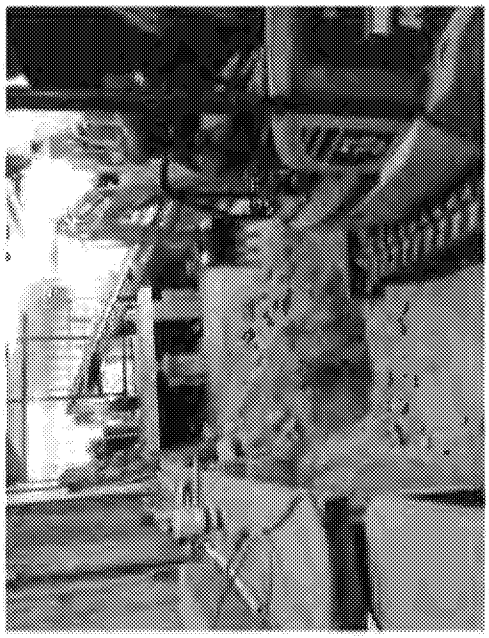


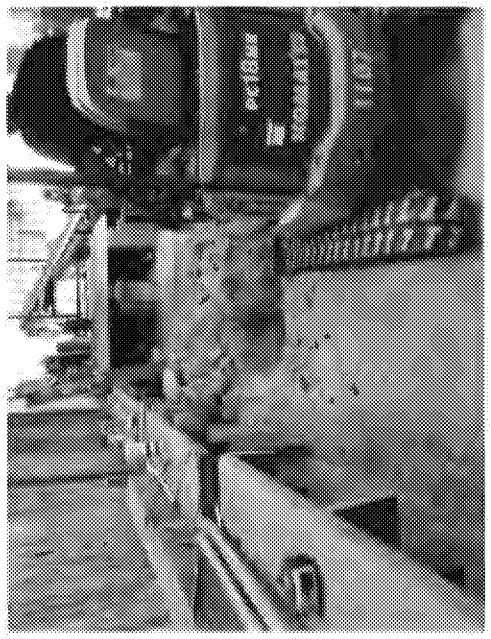


7/21/2015

7/22/2015







7/23/2015

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

July 14, 2015

Project: 12-1027.C

Submittal Date: 06/30/2015
Group Number: 1573346
SDG: TBH15
PO Number: 12-1027.C
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
Composite Soil	7949761
Composite Soil	7949762
Composite Soil	7949763

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO Ten Bears Environmental, LLC Attn: Ex. 4 CBI

Respectfully Submitted,

Ex. 4 CBI
Senior Specialist
(717) 556 Ex. 6 Personal Privacy (PP)

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Analysis Report

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Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		mg/kg	mg/kg	
10237	Acetone	67-64-1	N.D.	0.008	1.02
10237	Benzene	71-43-2	N.D.	0.0005	1.02
10237	Bromodichloromethane	75-27-4	N.D.	0.001	1.02
10237	Bromoform	75-25-2	N.D.	0.001	1.02
10237	Bromomethane	74-83-9	N.D.	0.002	1.02
10237	2-Butanone	78-93-3	N.D.	0.004	1.02
10237	Carbon Disulfide	75-15-0	N.D.	0.001	1.02
10237	Carbon Tetrachloride	56-23-5	N.D.	0.001	1.02
10237	Chlorobenzene	108-90-7	N.D.	0.001	1.02
10237	Chloroethane	75-00-3	N.D.	0.002	1.02
10237	Chloroform	67-66-3	N.D.	0.001	1.02
10237	Chloromethane	74-87-3	N.D.	0.002	1.02
10237	Cyclohexane	110-82-7	N.D.	0.001	1.02
10237	1,2-Dibromo-3-chloropropane	96-12-8	N.D.	0.002	1.02
10237	Dibromochloromethane	124-48-1	N.D.	0.001	1.02
10237	1,2-Dibromoethane	106-93-4	N.D.	0.001	1.02
10237	1,2-Dichlorobenzene	95-50-1	N.D.	0.001	1.02
10237	1,3-Dichlorobenzene	541-73-1	N.D.	0.001	1.02
10237	1,4-Dichlorobenzene	106-46-7	N.D.	0.001	1.02
10237	Dichlorodifluoromethane	75-71-8	N.D.	0.002	1.02
10237	1,1-Dichloroethane	75-34-3	N.D.	0.001	1.02
10237	1,2-Dichloroethane	107-06-2	N.D.	0.001	1.02
10237	1,1-Dichloroethene	75-35-4	N.D.	0.001	1.02
10237	cis-1,2-Dichloroethene	156-59-2	N.D.	0.001	1.02
10237	trans-1,2-Dichloroethene	156-60-5	N.D.	0.001	1.02
10237	1,2-Dichloropropane	78-87-5	N.D.	0.001	1.02
10237	cis-1,3-Dichloropropene	10061-01-5	N.D.	0.001	1.02
10237	trans-1,3-Dichloropropene	10061-02-6	N.D.	0.001	1.02
10237	Ethylbenzene	100-41-4	N.D.	0.001	1.02
10237	Freon 113	76-13-1	N.D.	0.002	1.02
10237	2-Hexanone	591-78-6	N.D.	0.003	1.02
10237	Isopropylbenzene	98-82-8	N.D.	0.001	1.02
10237	Methyl Acetate	79-20-9	N.D.	0.002	1.02
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.0005	1.02
10237	4-Methyl-2-pentanone	108-10-1	N.D.	0.003	1.02
10237	Methylcyclohexane	108-87-2	N.D.	0.001	1.02
10237	Methylene Chloride	75-09-2	N.D.	0.002	1.02
10237	Styrene	100-42-5	N.D.	0.001	1.02
10237	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.001	1.02
10237	Tetrachloroethene	127-18-4	N.D.	0.001	1.02
10237	Toluene	108-88-3	N.D.	0.001	1.02
10237	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.001	1.02
10237	1,1,1-Trichloroethane	71-55-6	N.D.	0.001	1.02
10237	1,1,2-Trichloroethane	79-00-5	N.D.	0.001	1.02
10237	Trichloroethene	79-01-6	N.D.	0.001	1.02
10237	Trichlorofluoromethane	75-69-4	N.D.	0.002	1.02
10237	Vinyl Chloride	75-01-4	N.D.	0.001	1.02
10237	Xylene (Total)	1330-20-7	N.D.	0.001	1.02
GC/MS Semivolatiles	**SW-846 8270C**		ug/kg	ug/kg	
10727	Acenaphthene	83-32-9	N.D.	4	1

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Analysis Report

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Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
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Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	
10727	Acenaphthylene	208-96-8	N.D.		4	1
10727	Acetophenone	98-86-2	N.D.		18	1
10727	Anthracene	120-12-7	N.D.		4	1
10727	Atrazine	1912-24-9	N.D.		35	1
10727	Benzaldehyde	100-52-7	N.D.		70	1
10727	Benzo(a)anthracene	56-55-3	11	J	4	1
10727	Benzo(a)pyrene	50-32-8	7	J	4	1
10727	Benzo(b)fluoranthene	205-99-2	43		4	1
10727	Benzo(g,h,i)perylene	191-24-2	16	J	4	1
10727	Benzo(k)fluoranthene	207-08-9	17	J	4	1
10727	1,1'-Biphenyl	92-52-4	N.D.		18	1
10727	4-Bromophenyl-phenylether	101-55-3	N.D.		18	1
10727	Butylbenzylphthalate	85-68-7	N.D.		70	1
10727	Di-n-butylphthalate	84-74-2	N.D.		70	1
10727	Caprolactam	105-60-2	N.D.		35	1
10727	Carbazole	86-74-8	N.D.		18	1
10727	4-Chloro-3-methylphenol	59-50-7	N.D.		18	1
10727	4-Chloroaniline	106-47-8	N.D.		35	1
10727	bis(2-Chloroethoxy)methane	111-91-1	N.D.		18	1
10727	bis(2-Chloroethyl)ether	111-44-4	N.D.		18	1
10727	2-Chloronaphthalene	91-58-7	N.D.		7	1
10727	2-Chlorophenol	95-57-8	N.D.		18	1
10727	4-Chlorophenyl-phenylether	7005-72-3	N.D.		18	1
10727	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.		18	1
	Bis(2-chloroisopropyl) ether CAS #39638-32-9 and 2,2'-Oxybis(1-chloropropane) CAS #108-60-1 cannot be separated chromatographically. The reported result represents the combined total of both compounds.					
10727	Chrysene	218-01-9	28		4	1
10727	Dibenz(a,h)anthracene	53-70-3	5	J	4	1
10727	Dibenzofuran	132-64-9	N.D.		18	1
10727	3,3'-Dichlorobenzidine	91-94-1	N.D.		110	1
10727	2,4-Dichlorophenol	120-83-2	N.D.		18	1
10727	Diethylphthalate	84-66-2	N.D.		70	1
10727	2,4-Dimethylphenol	105-67-9	N.D.		18	1
10727	Dimethylphthalate	131-11-3	N.D.		70	1
10727	4,6-Dinitro-2-methylphenol	534-52-1	N.D.		180	1
10727	2,4-Dinitrophenol	51-28-5	N.D.		320	1
10727	2,4-Dinitrotoluene	121-14-2	N.D.		70	1
10727	2,6-Dinitrotoluene	606-20-2	N.D.		18	1
10727	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.		70	1
10727	Fluoranthene	206-44-0	47		4	1
10727	Fluorene	86-73-7	N.D.		4	1
10727	Hexachlorobenzene	118-74-1	N.D.		4	1
10727	Hexachlorobutadiene	87-68-3	N.D.		18	1
10727	Hexachlorocyclopentadiene	77-47-4	N.D.		180	1
10727	Hexachloroethane	67-72-1	N.D.		35	1
10727	Indeno(1,2,3-cd)pyrene	193-39-5	12	J	4	1
10727	Isophorone	78-59-1	N.D.		18	1
10727	2-Methylnaphthalene	91-57-6	N.D.		4	1
10727	2-Methylphenol	95-48-7	N.D.		18	1

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Analysis Report

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Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
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Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	
10727	4-Methylphenol	106-44-5	N.D.		18	1
	3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.					
10727	Naphthalene	91-20-3	N.D.		4	1
10727	2-Nitroaniline	88-74-4	N.D.		18	1
10727	3-Nitroaniline	99-09-2	N.D.		70	1
10727	4-Nitroaniline	100-01-6	N.D.		70	1
10727	Nitrobenzene	98-95-3	N.D.		18	1
10727	2-Nitrophenol	88-75-5	N.D.		18	1
10727	4-Nitrophenol	100-02-7	N.D.		180	1
10727	N-Nitroso-di-n-propylamine	621-64-7	N.D.		18	1
10727	N-Nitrosodiphenylamine	86-30-6	N.D.		18	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
10727	Di-n-octylphthalate	117-84-0	N.D.		70	1
10727	Pentachlorophenol	87-86-5	N.D.		35	1
10727	Phenanthrene	85-01-8	22		4	1
10727	Phenol	108-95-2	N.D.		18	1
10727	Pyrene	129-00-0	26		4	1
10727	2,4,5-Trichlorophenol	95-95-4	N.D.		18	1
10727	2,4,6-Trichlorophenol	88-06-2	N.D.		18	1
GC Volatiles	**SW-846 8015B**		**mg/kg**		**mg/kg**	
01637	TPH-GRO soil C6-C10	n.a.	N.D.		0.2	23.99
	The holding time was not met. The sample was submitted to the laboratory with insufficient time remaining in the holding time.					
Pesticides/PCBs	**SW-846 8081A**		**ug/kg**		**ug/kg**	
10738	Aldrin	309-00-2	N.D.		0.18	1
10738	Alpha BHC	319-84-6	N.D.		0.18	1
10738	Beta BHC	319-85-7	N.D.		0.32	1
10738	Gamma BHC - Lindane	58-89-9	N.D.		0.18	1
10738	Alpha Chlordane	5103-71-9	0.46	J	0.18	1
10738	Gamma Chlordane	5103-74-2	0.66	JP	0.18	1
10738	p,p-DDD	72-54-8	6.9		0.35	1
10738	p,p-DDE	72-55-9	25	J	7.0	20
10738	p,p-DDT	50-29-3	140		7.4	20
10738	Delta BHC	319-86-8	N.D.		0.47	1
10738	Dieldrin	60-57-1	N.D.	V	1.0	1
10738	Endosulfan I	959-98-8	N.D.		0.23	1
10738	Endosulfan II	33213-65-9	0.74	JP	0.35	1
10738	Endosulfan Sulfate	1031-07-8	N.D.		0.35	1
10738	Endrin	72-20-8	N.D.	V	0.80	1
10738	Endrin Aldehyde	7421-93-4	N.D.		0.35	1
10738	Endrin Ketone	53494-70-5	N.D.		0.63	1
10738	Heptachlor	76-44-8	N.D.		0.18	1
10738	Heptachlor Epoxide	1024-57-3	N.D.		0.18	1
10738	Methoxychlor	72-43-5	N.D.		1.8	1
10738	Toxaphene	8001-35-2	N.D.		15	1

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Analysis Report

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Procino Plating 12-1027.C

LL Sample # SW 7949761
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Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
	Reporting limits were raised due to interference from the sample matrix.				
	The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC Standards. The following analytes are accepted based on this allowance: p,p-DDD				
Pesticides/PCBs	**SW-846 8082**		mg/kg	mg/kg	
10736	PCB-1016	12674-11-2	N.D.	0.0038	1
10736	PCB-1221	11104-28-2	N.D.	0.0049	1
10736	PCB-1232	11141-16-5	N.D.	0.0084	1
10736	PCB-1242	53469-21-9	N.D.	0.0035	1
10736	PCB-1248	12672-29-6	N.D.	0.0035	1
10736	PCB-1254	11097-69-1	N.D.	0.0035	1
10736	PCB-1260	11096-82-5	N.D.	0.0052	1
GC Miscellaneous	**SW-846 8015B**		mg/kg	mg/kg	
10941	TPH-DRO soil C10-C28 microwave	n.a.	N.D.	4.2	1
Metals	**SW-846 6010B**		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	2,770	4.66	1
06944	Antimony	7440-36-0	8.26	0.339	1
06935	Arsenic	7440-38-2	1.48 J	0.658	1
06946	Barium	7440-39-3	12.6	0.0339	1
06947	Beryllium	7440-41-7	N.D.	0.0688	1
06949	Cadmium	7440-43-9	N.D.	0.0339	1
01650	Calcium	7440-70-2	556	3.89	1
06951	Chromium	7440-47-3	332	0.113	1
06952	Cobalt	7440-48-4	0.541	0.0986	1
06953	Copper	7440-50-8	70.5	0.339	1
01654	Iron	7439-89-6	2,510	3.43	1
06955	Lead	7439-92-1	9.25	0.514	1
01657	Magnesium	7439-95-4	153	1.72	1
06958	Manganese	7439-96-5	17.7	0.0853	1
06961	Nickel	7440-02-0	461	0.154	1
01662	Potassium	7440-09-7	420	13.4	1
06936	Selenium	7782-49-2	0.917 J	0.466	1
06966	Silver	7440-22-4	2.24	0.201	1
01667	Sodium	7440-23-5	117	17.2	1
06925	Thallium	7440-28-0	N.D.	0.822	1
06971	Vanadium	7440-62-2	5.23	0.0935	1
06972	Zinc	7440-66-6	84.3	0.267	1
	SW-846 7471A		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0194 J	0.0099	1
Wet Chemistry	**SW-846 9012A modified**		mg/kg	mg/kg	
01123	Cyanide (Reactivity)	n.a.	N.D.	19.5	1

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Analysis Report

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Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Wet Chemistry	**40 CFR 261.21**				
00542	Ignitability	n.a.	See Below		1
	The sample did not spontaneously ignite when exposed to air or water. The sample did not ignite by friction. The sample vapors did not ignite when exposed to a flame using a closed cup apparatus.				
	SW-846 9034		**mg/kg**	**mg/kg**	
01122	Sulfide (Reactivity)	n.a.	N.D.	53.6	1
	SW-846 9045C modified		**Std. Units**	**Std. Units**	
00394	pH	n.a.	5.36	0.0100	1
	The pH was measured in water at 20.6 C.				
	SW-846 Chapter 7				
00496	Corrosivity	n.a.	See Below		1
	The pH of the sample is 5.36 indicating that the sample is not corrosive. A sample is corrosive if it exhibits a pH equal to or less than 2 or equal to or greater than 12.5.				
	SW-846 Chapter 7.3		**see below**	**see below**	
01121	Reactivity	n.a.	See Below		1
	Reactivity: This sample was extracted and analyzed by the interim method described in SW-846 Revision 3, December 1996 - Chapter 7.3. The Interim Guidance for Reactive Cyanide and Reactive Sulfide (SW-846 Sections 7.3.3 and 7.3.4 of Chapter 7 - December 1996) identifies a reactive material as generating more than 250 mg/kg of hydrogen cyanide or 500 mg/kg of hydrogen sulfide. This waste is not considered hazardous due to reactivity based on that standard. These results do not reflect total cyanide or total sulfide. On July 14, 2005, EPA published a rule in the Federal Register that removed the Interim Guidance and the method referenced above. At this time there is no specific guidance or a method to be used to evaluate "Reactivity".				
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	
00111	Moisture	n.a.	5.5	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.				

General Sample Comments

This sample was originally submitted to the laboratory on 06/19/15 at 20:10. We received authorization for further testing on 06/30/15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	8260 VOCs	SW-846 8260B	1	B151821AA	07/01/2015 17:39	Ex. 4 CBI	1.02
00374	GC/MS - Bulk Soil Prep	SW-846 5030A	1	201518238153	07/01/2015 09:50		n.a.
00374	GC/MS - Bulk Soil Prep	SW-846 5030A	2	201518238153	07/01/2015 09:50		n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5030A	1	201518238152	07/01/2015 09:38		n.a.
10727	TCL 8270 (microwave)	SW-846 8270C	1	15182SLA026	07/02/2015 12:30		1
10809	BNA Soil Microwave	SW-846 3546	1	15182SLA026	07/01/2015 19:55		1
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	15183A16A	07/06/2015 18:33		23.99
01150	GC - Bulk Soil Prep	SW-846 5030A	1	201518238152	07/01/2015 09:38		n.a.
10738	Pesticides in Soil (microwave)	SW-846 8081A	1	151830004A	07/09/2015 01:32		1
10738	Pesticides in Soil (microwave)	SW-846 8081A	1	151830004A	07/09/2015 15:05		20
10736	PCBs in Soil (microwave)	SW-846 8082	1	151830002A	07/06/2015 14:29		1
10497	PCB Microwave Soil Extraction	SW-846 3546	1	151830002A	07/02/2015 19:50		1
10496	PPL Pest. Microwave Extraction	SW-846 3546	1	151830004A	07/02/2015 19:50		1
10941	TPH-DRO soil C10-C28 microwave	SW-846 8015B	1	151820007A	07/06/2015 15:19		1
10942	Microwave Extraction-DRO soils	SW-846 3546	1	151820007A	07/01/2015 19:55		1
01643	Aluminum	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06944	Antimony	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06935	Arsenic	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06946	Barium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06947	Beryllium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06949	Cadmium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
01650	Calcium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06951	Chromium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06952	Cobalt	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06953	Copper	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
01654	Iron	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06955	Lead	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
01657	Magnesium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06958	Manganese	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06961	Nickel	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
01662	Potassium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06936	Selenium	SW-846 6010B	2	151895708001	07/09/2015 23:52		1
06966	Silver	SW-846 6010B	2	151895708001	07/09/2015 23:52		1
01667	Sodium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
06925	Thallium	SW-846 6010B	1	151835708003	07/06/2015 15:38		1

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Analysis Report

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Sample Description: Composite Soil
Procino Plating 12-1027.C

LL Sample # SW 7949761
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227A SDG#: TBH15-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06971	Vanadium	SW-846 6010B	1	151835708003	07/06/2015 15:38	Ex. 4 CBI	1
06972	Zinc	SW-846 6010B	1	151835708003	07/06/2015 15:38		1
00159	Mercury	SW-846 7471A	1	151835711002	07/06/2015 09:45		1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	151835708003	07/04/2015 00:25		1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	2	151895708001	07/09/2015 10:20		1
05711	Hg-SW, 7471A - U3	SW-846 7471A modified	1	151835711002	07/04/2015 04:50		1
01123	Cyanide (Reactivity)	SW-846 9012A modified	1	15187104201A	07/06/2015 14:08		1
00542	Ignitability	40 CFR 261.21	1	15192054201A	07/11/2015 12:25		1
01122	Sulfide (Reactivity)	SW-846 9034	1	15187112101A	07/06/2015 08:05		1
00394	pH	SW-846 9045C modified	1	15188039401A	07/07/2015 20:45		1
00496	Corrosivity	SW-846 Chapter 7	1	15188039401A	07/07/2015 20:45		1
01121	Reactivity	SW-846 Chapter 7.3	1	15187112101A	07/06/2015 08:05		1
00111	Moisture	SM 2540 G-1997	1	15188820003B	07/07/2015 19:17		1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Composite Soil
TCLP NVE
Procino Plating 12-1027.C

LL Sample # TL 7949762
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227N SDG#: TBH15-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		mg/l	mg/l	
00949	1,4-Dichlorobenzene	106-46-7	N.D.	0.003	1
00949	2,4-Dinitrotoluene	121-14-2	N.D.	0.005	1
00949	Hexachlorobenzene	118-74-1	N.D.	0.0005	1
00949	Hexachlorobutadiene	87-68-3	N.D.	0.003	1
00949	Hexachloroethane	67-72-1	N.D.	0.005	1
00949	2-Methylphenol	95-48-7	N.D.	0.003	1
00949	4-Methylphenol	106-44-5	N.D.	0.003	1
	3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.				
00949	Nitrobenzene	98-95-3	N.D.	0.003	1
00949	Pentachlorophenol	87-86-5	N.D.	0.005	1
00949	Pyridine	110-86-1	N.D.	0.010	1
00949	2,4,5-Trichlorophenol	95-95-4	N.D.	0.003	1
00949	2,4,6-Trichlorophenol	88-06-2	N.D.	0.003	1
	A shift ending check was not analyzed as per DNREC requirements. Client services was contacted and the data reported.				
Herbicides	**SW-846 8151A**		mg/l	mg/l	
00952	2,4-D	94-75-7	N.D.	0.016	1
00952	2,4,5-TP	93-72-1	N.D.	0.0010	1
Pesticides/PCBs	**SW-846 8081A**		mg/l	mg/l	
00950	Gamma BHC - Lindane	58-89-9	N.D.	0.000010	1
00950	Chlordane	57-74-9	N.D.	0.00080	1
00950	Endrin	72-20-8	0.000046 JP	0.000040	1
00950	Heptachlor	76-44-8	N.D.	0.000020	1
00950	Heptachlor Epoxide	1024-57-3	N.D.	0.000012	1
00950	Methoxychlor	72-43-5	N.D.	0.00015	1
00950	Toxaphene	8001-35-2	N.D.	0.0050	1
Metals	**SW-846 6010B**		mg/l	mg/l	
07035	Arsenic	7440-38-2	N.D.	0.0072	1
07046	Barium	7440-39-3	0.0775	0.00033	1
07049	Cadmium	7440-43-9	0.00081 J	0.00033	1
07051	Chromium	7440-47-3	0.937	0.0013	1
07055	Lead	7439-92-1	0.0055 J	0.0047	1
07036	Selenium	7782-49-2	N.D.	0.0048	1
07066	Silver	7440-22-4	0.0621	0.0018	1
	SW-846 7470A		mg/l	mg/l	
00259	Mercury	7439-97-6	0.00099	0.000050	1

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Composite Soil
TCLP NVE
Procino Plating 12-1027.C

LL Sample # TL 7949762
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227N SDG#: TBH15-02

General Sample Comments

This sample was originally submitted to the laboratory on 06/19/15 at 20:10. We received authorization for further testing on 06/30/15.

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00949	TCLP Acid Base/Neutrals	SW-846 8270C	1	15184WAE026	07/06/2015 12:02	Ex. 4 CBI	1
04731	TCLP Leachate Extraction	SW-846 3510C	1	15184WAE026	07/05/2015 16:30		1
00952	TCLP Herbicides	SW-846 8151A	1	151840016A	07/07/2015 00:06		1
00950	TCLP Pesticides	SW-846 8081A	1	151840009A	07/06/2015 13:46		1
11114	Pesticide Leachates Extraction	SW-846 3510C	1	151840009A	07/04/2015 14:15		1
11110	Herbicide Leachates Extraction	SW-846 8151A	1	151840016A	07/06/2015 08:00		1
07035	Arsenic	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07046	Barium	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07049	Cadmium	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07051	Chromium	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07055	Lead	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07036	Selenium	SW-846 6010B	1	151885705002	07/09/2015 02:26		1
07066	Silver	SW-846 6010B	2	151945705003	07/14/2015 09:04		1
00259	Mercury	SW-846 7470A	1	151885713005	07/10/2015 09:44		1
05705	ICP-WW/TL, 3010A (tot) - U3	SW-846 3010A	1	151885705002	07/08/2015 11:59		1
05705	ICP-WW/TL, 3010A (tot) - U3	SW-846 3010A	2	151945705003	07/13/2015 22:30		1
05713	WW SW846 Hg Digest	SW-846 7470A	1	151885713005	07/09/2015 14:07		1
00947	TCLP Non-volatile Extraction	SW-846 1311	1	15183-482-0947	07/02/2015 12:50		n.a.

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Composite Soil
TCLP ZHE
Procino Plating 12-1027.C

LL Sample # TL 7949763
LL Group # 1573346
Account # 10855

Project Name: 12-1027.C

Collected: 06/18/2015 09:20 by BE
through 06/18/2015 15:33
Submitted: 06/30/2015 19:10
Reported: 07/14/2015 22:29

Ten Bears Environmental, LLC
1080 South Chapel Street
Newark DE 19702

1227Z SDG#: TBH15-03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		mg/l	mg/l	
03636	Benzene	71-43-2	N.D.	0.010	20
03636	2-Butanone	78-93-3	N.D.	0.060	20
03636	Carbon Tetrachloride	56-23-5	N.D.	0.010	20
03636	Chlorobenzene	108-90-7	N.D.	0.010	20
03636	Chloroform	67-66-3	N.D.	0.010	20
03636	1,2-Dichloroethane	107-06-2	N.D.	0.010	20
03636	1,1-Dichloroethene	75-35-4	N.D.	0.010	20
03636	Tetrachloroethene	127-18-4	N.D.	0.010	20
03636	Trichloroethene	79-01-6	N.D.	0.010	20
03636	Vinyl Chloride	75-01-4	N.D.	0.010	20

General Sample Comments

This sample was originally submitted to the laboratory on 06/19/15 at 20:10. We received authorization for further testing on 06/30/15.

If the analysis is for determination of Hazardous Waste Characteristics, see Table 1 in EPA Code of Federal Regulations 40 CFR 261.24.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
03636	VOCs- 5ml TCLP Water by 8260B	SW-846 8260B	1	N151891AA	07/08/2015 13:13	Ex. 4 CBI	20
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N151891AA	07/08/2015 13:13		20
00946	TCLP Zero Headspace Extraction	SW-846 1311	1	15183-482-0946	07/02/2015 14:05		n.a.

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: Ten Bears Environmental, LLC
Reported: 07/14/2015 22:29

Group Number: 1573346

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: B151821AA	Sample number(s): 7949761							
Acetone	N.D.	0.007	mg/kg	100	107	57-127	6	30
Benzene	N.D.	0.0005	mg/kg	99	96	80-120	3	30
Bromodichloromethane	N.D.	0.001	mg/kg	94	91	75-120	3	30
Bromoform	N.D.	0.001	mg/kg	83	85	64-120	2	30
Bromomethane	N.D.	0.002	mg/kg	98	94	41-144	4	30
2-Butanone	N.D.	0.004	mg/kg	96	97	62-123	2	30
Carbon Disulfide	N.D.	0.001	mg/kg	83	77	52-126	7	30
Carbon Tetrachloride	N.D.	0.001	mg/kg	98	93	69-130	4	30
Chlorobenzene	N.D.	0.001	mg/kg	100	95	80-120	5	30
Chloroethane	N.D.	0.002	mg/kg	96	87	38-142	9	30
Chloroform	N.D.	0.001	mg/kg	107	104	80-120	3	30
Chloromethane	N.D.	0.002	mg/kg	93	83	56-120	11	30
Cyclohexane	N.D.	0.001	mg/kg	84	80	58-120	5	30
1,2-Dibromo-3-chloropropane	N.D.	0.002	mg/kg	90	93	59-122	3	30
Dibromochloromethane	N.D.	0.001	mg/kg	91	90	77-120	1	30
1,2-Dibromoethane	N.D.	0.001	mg/kg	103	102	80-120	1	30
1,2-Dichlorobenzene	N.D.	0.001	mg/kg	99	97	80-120	2	30
1,3-Dichlorobenzene	N.D.	0.001	mg/kg	95	93	80-120	2	30
1,4-Dichlorobenzene	N.D.	0.001	mg/kg	95	94	80-120	1	30
Dichlorodifluoromethane	N.D.	0.002	mg/kg	93	87	26-137	7	30
1,1-Dichloroethane	N.D.	0.001	mg/kg	95	91	77-120	4	30
1,2-Dichloroethane	N.D.	0.001	mg/kg	113	110	77-130	3	30
1,1-Dichloroethene	N.D.	0.001	mg/kg	102	94	73-129	8	30
cis-1,2-Dichloroethene	N.D.	0.001	mg/kg	106	100	80-120	5	30
trans-1,2-Dichloroethene	N.D.	0.001	mg/kg	106	101	79-122	4	30
1,2-Dichloropropane	N.D.	0.001	mg/kg	93	91	76-120	2	30
cis-1,3-Dichloropropene	N.D.	0.001	mg/kg	86	85	74-120	2	30
trans-1,3-Dichloropropene	N.D.	0.001	mg/kg	84	84	76-120	0	30
Ethylbenzene	N.D.	0.001	mg/kg	96	92	80-120	4	30
Freon 113	N.D.	0.002	mg/kg	105	97	54-123	8	30
2-Hexanone	N.D.	0.003	mg/kg	83	86	47-133	3	30
Isopropylbenzene	N.D.	0.001	mg/kg	99	94	76-120	5	30
Methyl Acetate	N.D.	0.002	mg/kg	104	101	63-132	3	30
Methyl Tertiary Butyl Ether	N.D.	0.0005	mg/kg	103	103	72-120	1	30
4-Methyl-2-pentanone	N.D.	0.003	mg/kg	87	91	57-123	4	30
Methylcyclohexane	N.D.	0.001	mg/kg	93	89	59-120	4	30
Methylene Chloride	N.D.	0.002	mg/kg	105	106	80-124	0	30
Styrene	N.D.	0.001	mg/kg	96	91	76-120	4	30
1,1,2,2-Tetrachloroethane	N.D.	0.001	mg/kg	94	93	72-120	2	30
Tetrachloroethene	N.D.	0.001	mg/kg	105	101	78-120	4	30
Toluene	N.D.	0.001	mg/kg	97	93	80-120	5	30
1,2,4-Trichlorobenzene	N.D.	0.001	mg/kg	97	94	68-120	2	30
1,1,1-Trichloroethane	N.D.	0.001	mg/kg	98	92	66-126	6	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,1,2-Trichloroethane	N.D.	0.001	mg/kg	99	99	80-120	1	30
Trichloroethene	N.D.	0.001	mg/kg	104	99	80-120	5	30
Trichlorofluoromethane	N.D.	0.002	mg/kg	109	101	58-133	8	30
Vinyl Chloride	N.D.	0.001	mg/kg	93	88	59-120	6	30
Xylene (Total)	N.D.	0.001	mg/kg	97	93	80-120	4	30
Batch number: N151891AA	Sample number(s): 7949763							
Benzene	N.D.	0.0005	mg/l	94	93	78-120	1	30
2-Butanone	N.D.	0.003	mg/l	92	96	54-133	4	30
Carbon Tetrachloride	N.D.	0.0005	mg/l	112	109	74-130	3	30
Chlorobenzene	N.D.	0.0005	mg/l	102	100	80-120	2	30
Chloroform	N.D.	0.0005	mg/l	102	101	80-120	1	30
1,2-Dichloroethane	N.D.	0.0005	mg/l	108	106	72-127	2	30
1,1-Dichloroethene	N.D.	0.0005	mg/l	96	95	76-124	1	30
Tetrachloroethene	N.D.	0.0005	mg/l	105	105	80-120	0	30
Trichloroethene	N.D.	0.0005	mg/l	104	101	80-120	3	30
Vinyl Chloride	N.D.	0.0005	mg/l	87	85	69-120	2	30
Batch number: 15182SLA026	Sample number(s): 7949761							
Acenaphthene	N.D.	3.	ug/kg	98		83-116		
Acenaphthylene	N.D.	3.	ug/kg	106		83-127		
Acetophenone	N.D.	17.	ug/kg	89		74-116		
Anthracene	N.D.	3.	ug/kg	100		82-118		
Atrazine	N.D.	33.	ug/kg	90		63-148		
Benzaldehyde	N.D.	67.	ug/kg	33		10-69		
Benzo(a)anthracene	N.D.	3.	ug/kg	94		76-119		
Benzo(a)pyrene	N.D.	3.	ug/kg	99		85-117		
Benzo(b)fluoranthene	N.D.	3.	ug/kg	103		78-129		
Benzo(g,h,i)perylene	N.D.	3.	ug/kg	92		82-119		
Benzo(k)fluoranthene	N.D.	3.	ug/kg	102		79-120		
1,1'-Biphenyl	N.D.	17.	ug/kg	92		78-111		
4-Bromophenyl-phenylether	N.D.	17.	ug/kg	102		84-120		
Butylbenzylphthalate	N.D.	67.	ug/kg	105		80-118		
Di-n-butylphthalate	N.D.	67.	ug/kg	105		84-120		
Caprolactam	N.D.	33.	ug/kg	85		76-123		
Carbazole	N.D.	17.	ug/kg	96		78-117		
4-Chloro-3-methylphenol	N.D.	17.	ug/kg	98		79-127		
4-Chloroaniline	N.D.	33.	ug/kg	62		10-101		
bis(2-Chloroethoxy)methane	N.D.	17.	ug/kg	107		77-116		
bis(2-Chloroethyl)ether	N.D.	17.	ug/kg	108		77-115		
2-Chloronaphthalene	N.D.	7.	ug/kg	98		63-146		
2-Chlorophenol	N.D.	17.	ug/kg	92		85-123		
4-Chlorophenyl-phenylether	N.D.	17.	ug/kg	95		81-120		
2,2'-oxybis(1-Chloropropane)	N.D.	17.	ug/kg	108		70-119		
Chrysene	N.D.	3.	ug/kg	97		80-121		
Dibenz(a,h)anthracene	N.D.	3.	ug/kg	92		81-123		
Dibenzofuran	N.D.	17.	ug/kg	93		85-115		
3,3'-Dichlorobenzidine	N.D.	100.	ug/kg	61		16-117		
2,4-Dichlorophenol	N.D.	17.	ug/kg	98		81-123		
Diethylphthalate	N.D.	67.	ug/kg	98		81-118		
2,4-Dimethylphenol	N.D.	17.	ug/kg	100		83-120		
Dimethylphthalate	N.D.	67.	ug/kg	100		82-113		
4,6-Dinitro-2-methylphenol	N.D.	170.	ug/kg	98		76-124		
2,4-Dinitrophenol	N.D.	300.	ug/kg	94		47-130		
2,4-Dinitrotoluene	N.D.	67.	ug/kg	90		81-122		
2,6-Dinitrotoluene	N.D.	17.	ug/kg	94		83-120		

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
bis(2-Ethylhexyl)phthalate	N.D.	67.	ug/kg	102		81-121		
Fluoranthene	N.D.	3.	ug/kg	94		81-117		
Fluorene	N.D.	3.	ug/kg	96		86-118		
Hexachlorobenzene	N.D.	3.	ug/kg	99		75-123		
Hexachlorobutadiene	N.D.	17.	ug/kg	98		78-121		
Hexachlorocyclopentadiene	N.D.	170.	ug/kg	108		75-176		
Hexachloroethane	N.D.	33.	ug/kg	96		78-114		
Indeno(1,2,3-cd)pyrene	N.D.	3.	ug/kg	90		81-118		
Isophorone	N.D.	17.	ug/kg	120		87-125		
2-Methylnaphthalene	N.D.	3.	ug/kg	89		83-109		
2-Methylphenol	N.D.	17.	ug/kg	103		82-125		
4-Methylphenol	N.D.	17.	ug/kg	86		75-119		
Naphthalene	N.D.	3.	ug/kg	98		83-112		
2-Nitroaniline	N.D.	17.	ug/kg	102		84-126		
3-Nitroaniline	N.D.	67.	ug/kg	89		66-119		
4-Nitroaniline	N.D.	67.	ug/kg	58		48-112		
Nitrobenzene	N.D.	17.	ug/kg	119*		80-115		
2-Nitrophenol	N.D.	17.	ug/kg	97		83-120		
4-Nitrophenol	N.D.	170.	ug/kg	91		60-129		
N-Nitroso-di-n-propylamine	N.D.	17.	ug/kg	101		75-116		
N-Nitrosodiphenylamine	N.D.	17.	ug/kg	110		83-118		
Di-n-octylphthalate	N.D.	67.	ug/kg	119		82-134		
Pentachlorophenol	N.D.	33.	ug/kg	90		57-126		
Phenanthrene	N.D.	3.	ug/kg	100		80-114		
Phenol	N.D.	17.	ug/kg	103		75-117		
Pyrene	N.D.	3.	ug/kg	96		81-114		
2,4,5-Trichlorophenol	N.D.	17.	ug/kg	102		86-123		
2,4,6-Trichlorophenol	N.D.	17.	ug/kg	111		81-123		
Batch number: 15184WAE026	Sample number(s): 7949762							
1,4-Dichlorobenzene	N.D.	0.003	mg/l	71		56-106		
2,4-Dinitrotoluene	N.D.	0.005	mg/l	99		77-124		
Hexachlorobenzene	N.D.	0.0005	mg/l	94		73-118		
Hexachlorobutadiene	N.D.	0.003	mg/l	71		42-110		
Hexachloroethane	N.D.	0.005	mg/l	65		43-108		
2-Methylphenol	N.D.	0.003	mg/l	81		66-112		
4-Methylphenol	N.D.	0.003	mg/l	59		56-109		
Nitrobenzene	N.D.	0.003	mg/l	90		77-119		
Pentachlorophenol	N.D.	0.005	mg/l	105		50-121		
Pyridine	N.D.	0.010	mg/l	46		22-96		
2,4,5-Trichlorophenol	N.D.	0.003	mg/l	109		76-116		
2,4,6-Trichlorophenol	N.D.	0.003	mg/l	113		75-117		
Batch number: 15183A16A	Sample number(s): 7949761							
TPH-GRO soil C6-C10	N.D.	0.2	mg/kg	78	75	61-120	4	30
Batch number: 151840016A	Sample number(s): 7949762							
2,4-D	N.D.	0.016	mg/l	90		68-155		
2,4,5-TP	N.D.	0.0010	mg/l	100		71-162		
Batch number: 151830002A	Sample number(s): 7949761							
PCB-1016	N.D.	0.0036	mg/kg	96		76-121		
PCB-1221	N.D.	0.0046	mg/kg					
PCB-1232	N.D.	0.0080	mg/kg					
PCB-1242	N.D.	0.0033	mg/kg					
PCB-1248	N.D.	0.0033	mg/kg					

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
PCB-1254	N.D.	0.0033	mg/kg					
PCB-1260	N.D.	0.0049	mg/kg	98		80-140		
Batch number: 151830004A	Sample number(s): 7949761							
Aldrin	N.D.	0.17	ug/kg	101		65-120		
Alpha BHC	N.D.	0.17	ug/kg	96		65-124		
Beta BHC	N.D.	0.30	ug/kg	107		73-124		
Gamma BHC - Lindane	N.D.	0.17	ug/kg	100		69-125		
Alpha Chlordane	N.D.	0.17	ug/kg	106		77-121		
Gamma Chlordane	N.D.	0.17	ug/kg	107		77-125		
p,p-DDD	N.D.	0.33	ug/kg	133*		81-132		
p,p-DDE	N.D.	0.33	ug/kg	113		81-137		
p,p-DDT	N.D.	0.35	ug/kg	114		77-135		
Delta BHC	N.D.	0.45	ug/kg	111		45-151		
Dieldrin	N.D.	0.33	ug/kg	110		75-127		
Endosulfan I	N.D.	0.22	ug/kg	92		62-119		
Endosulfan II	N.D.	0.33	ug/kg	109		74-126		
Endosulfan Sulfate	N.D.	0.33	ug/kg	122		71-132		
Endrin	N.D.	0.33	ug/kg	115		74-124		
Endrin Aldehyde	N.D.	0.33	ug/kg	111		71-114		
Endrin Ketone	N.D.	0.60	ug/kg	117		75-123		
Heptachlor	N.D.	0.17	ug/kg	100		66-118		
Heptachlor Epoxide	N.D.	0.17	ug/kg	113		74-128		
Methoxychlor	N.D.	1.7	ug/kg	123		80-131		
Toxaphene	N.D.	14.	ug/kg					
Batch number: 151840009A	Sample number(s): 7949762							
Gamma BHC - Lindane	N.D.	0.00001 0	mg/l	88		58-140		
Chlordane	N.D.	0.00080	mg/l					
Endrin	N.D.	0.00004 0	mg/l	91		35-143		
Heptachlor	N.D.	0.00002 0	mg/l	86		38-135		
Heptachlor Epoxide	N.D.	0.00001 2	mg/l	95		56-140		
Methoxychlor	N.D.	0.00015	mg/l	112		49-148		
Toxaphene	N.D.	0.0050	mg/l					
Batch number: 151820007A	Sample number(s): 7949761							
TPH-DRO soil C10-C28 microwave	N.D.	4.0	mg/kg	87		81-121		
Batch number: 151835708003	Sample number(s): 7949761							
Aluminum	N.D.	4.54	mg/kg	103		80-120		
Antimony	N.D.	0.330	mg/kg	107		80-120		
Arsenic	N.D.	0.640	mg/kg	104		80-120		
Barium	N.D.	0.0330	mg/kg	100		80-120		
Beryllium	N.D.	0.0670	mg/kg	101		80-120		
Cadmium	N.D.	0.0330	mg/kg	101		80-120		
Calcium	4.19 J	3.79	mg/kg	100		80-120		
Chromium	N.D.	0.110	mg/kg	99		80-120		
Cobalt	N.D.	0.0960	mg/kg	104		80-120		
Copper	N.D.	0.330	mg/kg	101		80-120		
Iron	N.D.	3.34	mg/kg	99		80-120		
Lead	N.D.	0.500	mg/kg	104		80-120		
Magnesium	N.D.	1.67	mg/kg	98		80-120		

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Manganese	N.D.	0.0830	mg/kg	100		80-120		
Nickel	N.D.	0.150	mg/kg	104		80-120		
Potassium	N.D.	13.0	mg/kg	99		80-120		
Sodium	N.D.	16.7	mg/kg	100		80-120		
Thallium	N.D.	0.800	mg/kg	103		80-120		
Vanadium	N.D.	0.0910	mg/kg	100		80-120		
Zinc	N.D.	0.260	mg/kg	99		80-120		
Batch number: 151835711002	Sample number(s): 7949761							
Mercury	N.D.	0.0100	mg/kg	103		80-120		
Batch number: 151885705002	Sample number(s): 7949762							
Arsenic	N.D.	0.0072	mg/l	111		80-120		
Barium	0.00088 J	0.00033	mg/l	101		80-120		
Cadmium	N.D.	0.00033	mg/l	105		80-120		
Chromium	0.0025 J	0.0013	mg/l	101		80-120		
Lead	N.D.	0.0047	mg/l	100		80-120		
Selenium	N.D.	0.0048	mg/l	116		80-120		
Batch number: 151885713005	Sample number(s): 7949762							
Mercury	N.D.	0.00005 0	mg/l	115		80-120		
Batch number: 151895708001	Sample number(s): 7949761							
Selenium	N.D.	0.440	mg/kg	99		80-120		
Silver	N.D.	0.190	mg/kg	89		80-120		
Batch number: 151945705003	Sample number(s): 7949762							
Silver	N.D.	0.0018	mg/l	100		80-120		
Batch number: 15187104201A	Sample number(s): 7949761							
Cyanide (Reactivity)	N.D.	20.0	mg/kg	88		77-113		
Batch number: 15187112101A	Sample number(s): 7949761							
Sulfide (Reactivity)	N.D.	53.6	mg/kg	91		68-102		
Batch number: 15188039401A	Sample number(s): 7949761							
Corrosivity				100		89-110		
pH				100		95-105		
Batch number: 15188820003B	Sample number(s): 7949761							
Moisture				100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: N151891AA	Sample number(s): 7949763 UNSPK: P943905								
Benzene	100	100	72-134	1	30				
2-Butanone	95	97	44-135	2	30				

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Carbon Tetrachloride	120	118	75-148	2	30				
Chlorobenzene	106	105	87-124	1	30				
Chloroform	105	104	81-134	1	30				
1,2-Dichloroethane	108	107	63-142	1	30				
1,1-Dichloroethene	104	104	79-137	0	30				
Tetrachloroethene	115	116	80-128	1	30				
Trichloroethene	110	107	88-133	3	30				
Vinyl Chloride	89	90	66-133	2	30				
Batch number: 15182SLA026	Sample number(s): 7949761 UNSPK: P940808								
Acenaphthene	95	86	45-141	10	30				
Acenaphthylene	101	91	53-143	10	30				
Acetophenone	87	79	35-147	10	30				
Anthracene	96	85	42-147	12	30				
Atrazine	87	77	33-141	13	30				
Benzaldehyde	45	39	10-85	13	30				
Benzo(a)anthracene	92	82	32-150	11	30				
Benzo(a)pyrene	92	82	36-151	12	30				
Benzo(b)fluoranthene	93	83	29-150	11	30				
Benzo(g,h,i)perylene	94	86	41-147	9	30				
Benzo(k)fluoranthene	90	77	35-146	16	30				
1,1'-Biphenyl	88	82	34-145	7	30				
4-Bromophenyl-phenylether	99	88	48-146	12	30				
Butylbenzylphthalate	101	93	50-137	8	30				
Di-n-butylphthalate	102	90	65-126	13	30				
Caprolactam	84	71	34-145	17	30				
Carbazole	90	79	36-143	14	30				
4-Chloro-3-methylphenol	95	82	48-141	15	30				
4-Chloroaniline	42	54	10-100	25	30				
bis(2-Chloroethoxy)methane	106	94	64-119	13	30				
bis(2-Chloroethyl)ether	104	95	63-122	9	30				
2-Chloronaphthalene	84	77	40-156	10	30				
2-Chlorophenol	91	83	50-142	10	30				
4-Chlorophenyl-phenylether	91	81	49-135	12	30				
2,2'-oxybis(1-Chloropropane)	105	96	60-120	9	30				
Chrysene	94	83	28-146	12	30				
Dibenz(a,h)anthracene	94	85	38-156	10	30				
Dibenzofuran	90	80	34-146	11	30				
3,3'-Dichlorobenzidine	66	69	10-143	4	30				
2,4-Dichlorophenol	97	83	46-145	16	30				
Diethylphthalate	97	86	61-124	13	30				
2,4-Dimethylphenol	99	88	38-140	12	30				
Dimethylphthalate	98	89	59-124	10	30				
4,6-Dinitro-2-methylphenol	53	37	10-148	36*	30				
2,4-Dinitrophenol	40	19*	20-143	73*	30				
2,4-Dinitrotoluene	87	75	37-149	16	30				
2,6-Dinitrotoluene	92	79	54-134	16	30				
bis(2-Ethylhexyl)phthalate	101	92	60-133	10	30				
Fluoranthene	90	79	41-135	12	30				
Fluorene	92	82	43-146	12	30				
Hexachlorobenzene	95	85	36-150	12	30				
Hexachlorobutadiene	97	85	65-125	14	30				

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Hexachlorocyclopentadiene	6*	8*	10-153	25	30				
Hexachloroethane	71	68	37-143	5	30				
Indeno(1,2,3-cd)pyrene	91	81	35-151	12	30				
Isophorone	118	103	68-119	14	30				
2-Methylnaphthalene	87	75	39-140	15	30				
2-Methylphenol	117	110	36-149	7	30				
4-Methylphenol	89	81	46-135	9	30				
Naphthalene	98	85	39-147	13	30				
2-Nitroaniline	100	92	46-152	9	30				
3-Nitroaniline	83	74	31-145	11	30				
4-Nitroaniline	72	65	30-131	10	30				
Nitrobenzene	117	104	54-131	12	30				
2-Nitrophenol	91	78	38-150	16	30				
4-Nitrophenol	98	82	25-142	18	30				
N-Nitroso-di-n-propylamine	101	91	58-126	11	30				
N-Nitrosodiphenylamine	107	98	41-147	9	30				
Di-n-octylphthalate	106	91	53-156	15	30				
Pentachlorophenol	88	76	23-145	16	30				
Phenanthrene	97	83	42-141	15	30				
Phenol	105	95	53-129	11	30				
Pyrene	94	84	37-140	12	30				
2,4,5-Trichlorophenol	105	92	42-144	13	30				
2,4,6-Trichlorophenol	98	91	43-145	8	30				
Batch number: 15184WAE026	Sample number(s): 7949762 UNSPK: P945348								
1,4-Dichlorobenzene	69	72	51-108	5	30				
2,4-Dinitrotoluene	97	100	51-145	2	30				
Hexachlorobenzene	91	95	71-119	4	30				
Hexachlorobutadiene	70	73	44-113	5	30				
Hexachloroethane	61	65	32-120	6	30				
2-Methylphenol	76	75	27-132	2	30				
4-Methylphenol	54	54	13-128	1	30				
Nitrobenzene	87	88	50-143	2	30				
Pentachlorophenol	96	103	23-140	7	30				
Pyridine	42	44	20-91	4	30				
2,4,5-Trichlorophenol	106	106	34-143	0	30				
2,4,6-Trichlorophenol	107	107	19-162	0	30				
Batch number: 151840016A	Sample number(s): 7949762 UNSPK: P940930								
2,4-D	93	100	55-174	7	30				
2,4,5-TP	106	113	63-174	6	30				
Batch number: 151830002A	Sample number(s): 7949761 UNSPK: P945514								
PCB-1016	88	91	41-135	5	50				
PCB-1260	83	88	38-148	7	50				
Batch number: 151830004A	Sample number(s): 7949761 UNSPK: P945514								
Aldrin	119	113	45-128	5	50				
Alpha BHC	100	104	28-134	3	50				
Beta BHC	114	110	32-151	4	50				
Gamma BHC - Lindane	132	86	30-137	42	50				
Alpha Chlordane	90	88	27-146	3	50				

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Gamma Chlordane	92	91	27-143	1	50				
p,p-DDD	120	118	43-149	2	50				
p,p-DDE	104	99	35-152	5	50				
p,p-DDT	139	134	12-193	4	50				
Delta BHC	103	103	13-153	1	50				
Dieldrin	90	86	41-153	5	50				
Endosulfan I	72	71	28-136	3	50				
Endosulfan II	101	97	36-136	4	50				
Endosulfan Sulfate	102	95	10-181	8	50				
Endrin	110	104	30-152	6	50				
Endrin Aldehyde	107	102	23-138	5	35				
Endrin Ketone	106	99	30-148	7	50				
Heptachlor	110	109	38-134	1	50				
Heptachlor Epoxide	90	89	54-134	1	50				
Methoxychlor	175*	165*	43-153	6	50				
Batch number: 151840009A	Sample number(s): 7949762 UNSPK: P940930								
Gamma BHC - Lindane	102	105	60-142	3	30				
Endrin	98	97	57-143	1	30				
Heptachlor	87	86	43-137	1	30				
Heptachlor Epoxide	123	121	63-139	2	30				
Methoxychlor	118	117	44-155	1	30				
Batch number: 151820007A	Sample number(s): 7949761 UNSPK: P942624 BKG: P942624								
TPH-DRO soil C10-C28 microwave	97		35-129			22	25	12 (1)	20
Batch number: 151835708003	Sample number(s): 7949761 UNSPK: P951916 BKG: P951916								
Aluminum	3673 (2)	4664 (2)	75-125	11	20	9,650	10,800	11	20
Antimony	70*	67*	75-125	4	20	10.2	3.37	101* (1)	20
Arsenic	100	113	75-125	12	20	N.D.	N.D.	0 (1)	20
Barium	104	107	75-125	2	20	23.2	29.8	25*	20
Beryllium	99	96	75-125	3	20	0.640	0.516	21* (1)	20
Cadmium	93	94	75-125	1	20	N.D.	N.D.	0 (1)	20
Calcium	108	131*	75-125	14	20	176	204	15	20
Chromium	176*	141*	75-125	13	20	21.2	19.9	6	20
Cobalt	96	101	75-125	5	20	3.26	3.48	6	20
Copper	114	102	75-125	8	20	9.00	9.14	1	20
Iron	-28451 (2)	-31595 (2)	75-125	9	20	62,100	29,100	72*	20
Lead	69*	66*	75-125	2	20	12.0	9.25	26*	20
Magnesium	109	323*	75-125	39*	20	631	814	25*	20
Manganese	39*	305*	75-125	71*	20	98.3	111	12	20
Nickel	98	106	75-125	7	20	4.11	5.62	31* (1)	20
Potassium	110	131*	75-125	12	20	489	571	15	20
Sodium	98	96	75-125	2	20	17.1 J	16.7 J	2 (1)	20
Thallium	78	75	75-125	3	20	3.55	1.23 J	97* (1)	20
Vanadium	133*	125	75-125	4	20	27.7	31.1	12	20
Zinc	96	104	75-125	6	20	13.7	18.3	29*	20
Batch number: 151835711002	Sample number(s): 7949761 UNSPK: P951916 BKG: P951916								
Mercury	106	108	80-120	2	20	0.0102 J	N.D.	200* (1)	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 151885705002	Sample number(s): 7949762 UNSPK: 7949762 BKG: 7949762								
Arsenic	101	99	75-125	1	20	N.D.	N.D.	0 (1)	20
Barium	58*	52*	75-125	10	20	0.0775	0.0778	0	20
Cadmium	90	89	75-125	2	20	0.00081 J	0.00071 J	13 (1)	20
Chromium	86	82	75-125	3	20	0.937	0.922	2	20
Lead	77	76	75-125	1	20	0.0055 J	0.0071 J	26* (1)	20
Selenium	101	100	75-125	1	20	N.D.	N.D.	0 (1)	20
Batch number: 151885713005	Sample number(s): 7949762 UNSPK: 7949762 BKG: 7949762								
Mercury	96	95	80-120	1	20	0.00099	0.00096	4 (1)	20
Batch number: 151895708001	Sample number(s): 7949761 UNSPK: P951916 BKG: P951916								
Selenium	88	94	75-125	5	20	N.D.	N.D.	0 (1)	20
Silver	88	90	75-125	0	20	0.200 J	0.303 J	41* (1)	20
Batch number: 151945705003	Sample number(s): 7949762 UNSPK: 7949762 BKG: 7949762								
Silver	38*	35*	75-125	6	20	0.0621	0.0619	0	20
Batch number: 15187104201A	Sample number(s): 7949761 UNSPK: 7949761								
Cyanide (Reactivity)	0*	0*	77-113	0	11				
Batch number: 15187112101A	Sample number(s): 7949761 UNSPK: 7949761								
Sulfide (Reactivity)	21*	25*	68-102	16	24				
Batch number: 15188039401A	Sample number(s): 7949761 BKG: P947988								
Corrosivity						8.1	8.0	1	2
pH						8.05	8.00	1	3
Batch number: 15188820003B	Sample number(s): 7949761 BKG: P948420								
Moisture						10.3	9.9	4	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260 VOCs
Batch number: B151821AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7949761	109	103	98	95
Blank	110	107	97	97
LCS	108	113	100	99
LCSD	110	113	100	99
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- 5ml TCLP Water by 8260B
Batch number: N151891AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Surrogate Quality Control

7949763	113	106	97	91
Blank	115	109	97	91
LCS	108	104	100	102
LCSD	106	103	101	101
MS	107	105	101	102
MSD	107	103	101	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: TCL 8270 (microwave)
Batch number: 15182SLA026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
7949761	80	87	44	105	94	85
Blank	93	94	80	105	94	87
LCS	95	99	79	114	102	94
MS	90	93	71	106	96	86
MSD	81	83	63	93	87	76
Limits:	58-122	57-128	36-142	54-123	63-124	61-142

Analysis Name: TCLP Acid Base/Neutrals
Batch number: 15184WAE026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol
7949762	82	86	91	31	48	86
Blank	78	84	89	26	44	85
LCS	86	100	93	29	50	82
MS	82	96	86	26	43	78
MSD	86	97	89	27	46	81
Limits:	60-123	61-112	35-144	10-82	10-107	23-145

Analysis Name: TPH-GRO soil C6-C10
Batch number: 15183A16A

	Trifluorotoluene-F
7949761	84
Blank	89
LCS	91
LCSD	92
Limits:	50-142

Analysis Name: PCBs in Soil (microwave)
Batch number: 151830002A

	Tetrachloro-m-xylene	Decachlorobiphenyl
7949761	99	82
Blank	99	88
LCS	100	89
MS	98	82
MSD	97	82
Limits:	50-148	43-155

Analysis Name: Pesticides in Soil (microwave)
Batch number: 151830004A

	Tetrachloro-m-xylene	Decachlorobiphenyl
7949761	82	118
Blank	94	123
LCS	89	123
MS	85	101
MSD	84	93

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

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Analysis Report

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Quality Control Summary

Client Name: Ten Bears Environmental, LLC Group Number: 1573346
Reported: 07/14/2015 22:29

Surrogate Quality Control

Limits: 43-127 54-143

Analysis Name: TCLP Pesticides
Batch number: 151840009A

	Tetrachloro-m-xylene	Decachlorobiphenyl
7949762	93	85
Blank	64	92
LCS	69	97
MS	79	93
MSD	79	94
Limits:	39-138	32-149

Analysis Name: TCLP Herbicides
Batch number: 151840016A

	2,4-Dichlorophenylacetic acid
7949762	92
Blank	86
LCS	87
MS	86
MSD	93
Limits:	26-136

Analysis Name: TPH-DRO soil C10-C28 microwave
Batch number: 151820007A

	Orthoterphenyl
7949761	86
Blank	93
DUP	87
LCS	84
MS	87
Limits:	54-145

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

Acct. # 10855

For Eurofins Lancaster Laboratories Environmental use only
Group # ~~15107-5~~ Sample # ~~15733-43~~ 15733416 7949761-63

Instructions on reverse side correspond with circled numbers.

TH 6/30/15 (8) Re-entry

380984

1 of 3

1 Client Information

Client: Ten Beers Environmental
Acct. #: 10855
Project Name/#: 12-1027.C
PWSID #:
Proj Ex. 4 CBI
P.O. #:
Sampler: BE
Quote #:
Name of state where samples were collected: DE

4 Matrix: Sediment ☐ Ground ☐ Surface ☐ Potable ☐ NPDES ☐ Soil ☒ Water Other: ____

5 Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#: 173301

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

6 Remarks

2 Sample Identification / **3 Collected**

Sample Identification	Date	Time	Grab	Composite	Total # of Containers	Total Chromium	Remarks
SB-1 (0-3')	6/18/15	0920		X	3	X	← QA/QC
SB-1 (3-6')		0936		X	1	X	
SB-1 (6-8')		1010		X	1	X	
SB-2 (0-3')		1025		X	1	X	← MS/MSD
SB-2 (3-6')		1035		X	1	X	
SB-2 (6-8')		1045		X	1	X	* Additional Analysis
SB-3 (0-3)		1100		X	1	X	may be requested
SB-3 (3-6)		1112		X	1	X	per Quote #
SB-3 (6-8)		1127		X	1	X	208890A
SB-4 (0-3)		1145		X	1	X	

7 Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address: Ex. 4 CBI @tenbeers.v3.

Ex. 4 CBI

Relinquished by	Date	Time
	6/18/15	1300
	6/18/15	1330
	6/19/15	2010

Ex. 4 CBI

Date	Time
6/17/15	1000 MS
6-19-15	1730
6/19/15	2010

8 Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format:
Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____
Temperature upon receipt 0.9-1.6 °C

HSCA DATA PACKAGE

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7044 0315

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 For Eurofins Lancaster Laboratories Environmental use only Group # ~~1570751~~ 1573346 Sample # ~~7937472-93~~ 7949761-63 6/30/15 (8) re-entry

Instructions on reverse side correspond with circled numbers.

380985

2 of 3

(1) Client Information

Client: Ten Bears Environmental	Acct. #: 10855
Project Name/#: 12-1027.C	PWSID #:
Project Manager: Ex. 4 CBI	P.O. #:
Sampler: BE	Quote #:
Name of state where samples were collected: DE	

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

(2) Sample Identification	Collected Date	Collected Time	(3) Grab	Composite	(4) Matrix: Soil ☒ Sediment	Water: Potable ☐ Ground ☐ NPDES ☐ Surface	Other:	Total # of Containers	(5) Analysis Requested: Total Chromium	(6) Remarks
SB-4 (3-6)		1155		X	X			1	X	* Additional Analysis
SB-4 (6-8)		1215		X	X			1	X	may be requested
SB-5 (0-3)		1238		X	X			1	X	per Quote #
SB-5 (3-6)		1248		X	X			1	X	208890A
SB-5 (6-8)		1300		X	X			1	X	
SB-6 (0-3)		1317		X	X			1	X	
SB-6 (3-6)		1330		X	X			1	X	
SB-6 (6-8)		1340		X	X			1	X	
SB-7 (0-3)		1352		X	X			1	X	
SB-7 (3-6)		1407		X	X			1	X	

(7) Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address: Ex. 4 CBI @tenbears.us

Relinquished by	Date	Time	Relinquished by	Date	Time
Ex. 4 CBI	6-19-15	12:30	Ex. 4 CBI	6/17/15	[illegible]
	6-19-15	2010		6-19-15	12:30
				6/19/15	2010

(8) Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format:
Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____
Temperature upon receipt 0.9-1.6 °C

HSCA DATA PACKAGE

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7044 0315

Environmental Analysis Request/Chain of Custody

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Acct. # 10855 For Eurofins Lancaster Laboratories Environmental use only Group # ~~1570752~~ 1573346 Sample # ~~7937444-505~~ 7949761-63 ph 6/30/15 (8) re-entry

Instructions on reverse side correspond with circled numbers.

380986 3 of 3

(1) Client Information

Client: Ten Bears Environmental	Acct. #: 10855
Project Name/#: 12-1027.C	PWSID #:
Project Ma[illegible] Ex. 4 CBI	P.O. #:
Sampler: BE	Quote #:
Name of state where samples were collected: DE	

(4) Matrix: Sediment ☐ Ground ☐ Surface ☐ Potable ☐ NPDES ☐ Soil ☒ Water Other: ____

(5) Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#:

Preservation Codes: H=HCl T=Thiosulfate N=HNO_3 B=NaOH S=H_2SO_4 O=Other

(2) Sample Identification	Collected Date	Collected Time	(3) Grab	Composite	Soil	Water	Other	Total # of Containers	Total Chromium	(6) Remarks
SB-7(6-8)		1418		X	X			1	X	* Additional
SB-8(0-3)		1435		X	X			1	X	Analysis may be
SB-8(3-6)		1444		X	X			1	X	requested per
SB-8(6-8)		1457		X	X			1	X	Quote # 208890A
SB-9(0-3)		1508		X	X			1	X	
SB-9(3-6)		1520		X	X			1	X	
SB-9(6-8)		1533		X	X			1	X	
Rinse Blank		1650		X	~~X~~	X		1	X	
				✓	BE					

(7) Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: Ex. 4 CBI @tenbears.us

Relinquished by	Date	Time	Relinquished by	Date	Time
Ex. 4 CBI	6-19-15	1220	Ex. 4 CBI	6/17/15	
	6-19-15	2010		6-19-15	1220
				6/19/15	2010

(8) Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: ____
Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____
Temperature upon receipt 0.9-1.6 °C

HSLA Data Package

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0315

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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APPENDIX H

ProUCL Calculations
Chromium in Groundwater 2014-2015

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	8/6/2015 10:05:25 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium 95%UCL, Procino Plating Site

General Statistics

Total Number of Observations	20	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	6.0000E-4	Mean	0.0134
Maximum	0.115	Median	8.0000E-4
SD	0.0307	Std. Error of Mean	0.00688
Coefficient of Variation	2.302	Skewness	2.802

Normal GOF Test

Shapiro Wilk Test Statistic	0.481	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.365	Lilliefors GOF Test
5% Lilliefors Critical Value	0.198	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0252	95% Adjusted-CLT UCL (Chen-1995)	0.0293
		95% Modified-t UCL (Johnson-1978)	0.026

Gamma GOF Test

A-D Test Statistic	3.295	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.83	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.377	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.208	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.37	k star (bias corrected MLE)	0.348
Theta hat (MLE)	0.0361	Theta star (bias corrected MLE)	0.0384
nu hat (MLE)	14.8	nu star (bias corrected)	13.92
MLE Mean (bias corrected)	0.0134	MLE Sd (bias corrected)	0.0226
		Approximate Chi Square Value (0.05)	6.514
Adjusted Level of Significance	0.038	Adjusted Chi Square Value	6.117

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.0285	95% Adjusted Gamma UCL (use when n<50)	0.0304

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.708		Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905		Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.372		Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.198		Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-7.419	Mean of logged Data	-6.116
Maximum of Logged Data	-2.163	SD of logged Data	1.722

Assuming Lognormal Distribution

95% H-UCL	0.0438	90% Chebyshev (MVUE) UCL	0.02
95% Chebyshev (MVUE) UCL	0.0253	97.5% Chebyshev (MVUE) UCL	0.0327
99% Chebyshev (MVUE) UCL	0.0471		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0247	95% Jackknife UCL	0.0252
95% Standard Bootstrap UCL	0.0246	95% Bootstrap-t UCL	0.0639
95% Hall's Bootstrap UCL	0.0778	95% Percentile Bootstrap UCL	0.0252
95% BCA Bootstrap UCL	0.0306		
90% Chebyshev(Mean, Sd) UCL	0.034	95% Chebyshev(Mean, Sd) UCL	0.0433
97.5% Chebyshev(Mean, Sd) UCL	0.0563	99% Chebyshev(Mean, Sd) UCL	0.0818

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	0.0433

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

APPENDIX I

RAIS Printouts: Chromium Risk Calculation

Hypothetical Soil Risk at the DNREC Screening Level Concentration (Hexavalent Chromium, 214 mg/kg):

I-1 Commercial / Industrial Indoor Worker

I-2 Commercial / Industrial Composite Worker

Hypothetical Soil Risk at the maximum Sub-slab Concentration (Hexavalent Chromium, 332 mg/kg)

I-3 Construction / Excavation Worker

Hypothetical Tapwater Ingestion Risk at the maximum 2015 Groundwater Concentration (115 µg/L)

I-4 Indoor Commercial/Industrial Worker (Hexavalent)

I-5 Indoor Commercial / Industrial Worker (Trivalent)

The SAS System

Indoor Worker RISK for Soil

Chemical	Mutagen?	VOC?	Concentration (mg/kg)	Ingestion HQ	Inhalation HQ	Total HI	Ingestion Risk	Inhalation Risk	Total Risk
Chromium(VI)	Yes	No	214	3.05E-02	3.59E-04	3.09E-02	[illegible]	[illegible]	[illegible]
*Total Risk/HI			-	3.05E-02	3.59E-04	3.09E-02	[illegible]	[illegible]	[illegible]

Output generated 12AUG2015:15:55:15

The SAS System
Composite Worker RISK for Soil

Chemical	Mutagen?	VOC?	Concentration (mg/kg)	Ingestion HQ	Inhalation HQ	Dermal HQ	Total HI	Ingestion Risk	Inhalation Risk	Dermal Risk	Total Risk
Chromium(VI)	Yes	No	214	6.11E-02	3.59E-04	-	6.14E-02	[illegible]	[illegible]	-	[illegible]
Total Risk/HI			-	6.11E-02	3.59E-04	-	6.14E-02	[illegible]	[illegible]	-	[illegible]

Output generated 12AUG2015:15:53:12

Site-Specific
Excavation Worker RISK for Soil

Chemical	Mutagen?	VOC?	Concentration (mg/kg)	Ingestion HQ	Inhalation HQ	Dermal HQ	Total HI	Ingestion Risk	Inhalation Risk	Dermal Risk	Total Risk
Chromium(VI)	Yes	No	392	2.95E-02	5.27E-05	-	2.96E-02	6.33E-07	6.32E-09	-	6.39E-07
**Total Risk/HI*			*-*	*2.95E-02*	*5.27E-05*	*-*	*2.96E-02*	*6.33E-07*	*6.32E-09*	*-*	*6.39E-07*

Output generated 21OCT2015:16:52:29

The SAS System

Indoor Worker RISK for Tapwater

Chemical	Mutagen?	VOC?	Concentration (mg/L)	Original Concentration (ug/L)	Ingestion HQ	Inhalation HQ	Dermal HQ	Total HI	Ingestion Risk	Inhalation Risk	Dermal Risk	Total Risk
Chromium(VI)	Yes	No	0.115	115	3.28E-01	-	3.90E-01	7.18E-01	1.78E-04	-	2.09E-04	3.85E-04
Total Risk/HI			-	-	*3.28E-01*	-	*3.90E-01*	*7.18E-01*	*1.78E-04*	-	*2.09E-04*	*3.85E-04*

Output generated 12AUG2015:15:59:17

The SAS System
Indoor Worker RISK for Tapwater

Chemical	Mutagen?	VOC?	Concentration (mg/L)	Original Concentration (ug/L)	Ingestion HQ	Inhalation HQ	Dermal HQ	Total HI	Ingestion Risk	Inhalation Risk	Dermal Risk	Total Risk
Chromium(III), Insoluble Salts	No	No	0.115	115	6.56E-04	-	7.49E-04	1.41E-03	-	-	-	-
*Total Risk/HI			-	-	6.56E-04	-	7.49E-04	1.41E-03	-	-	-	-

Output generated 12AUG2015:16:01:17

APPENDIX J

Physical & Chemical Information for Chromium

(Agency for Toxic Substances Disease Registry, Center for Disease Control, and US EPA Superfund Chemical Data Matrix)

4. CHEMICAL AND PHYSICAL INFORMATION

4.1 CHEMICAL IDENTITY

Information regarding the chemical identity of chromium is located in Table 4-1.

The synonyms, trade name, chemical formula, and identification numbers of chromium and selected salts are reported in Table 4-1.

4.2 PHYSICAL AND CHEMICAL PROPERTIES

Information regarding the physical and chemical properties of chromium is located in Table 4-2.

Chromium is a metallic element with oxidation states ranging from chromium(-II) to chromium(+VI) with the trivalent (III) and hexavalent (VI) sates being the most predominant. The Chemical Abstracts Service (CAS) Registry numbers for trivalent and hexavalent chromium are 16065-83-3 and 18540-29-9, respectively. Elemental chromium, chromium(0), does not occur naturally. Although there is a divalent state, chromium II (chromous), it is relatively unstable under environmental conditions and is readily oxidized to the trivalent (III or chromic) state. Chromium compounds are most stable in the trivalent state under environmental conditions and occur in nature in ores, such as ferrochromite ($FeCr_2O_4$). The hexavalent (VI or chromate) is the second most stable state; however, it only occurs naturally in rare minerals such as crocoite ($PbCrO_4$) (Hurlbut 1971; Papp and Lipin 2001). Hexavalent chromium compounds primarily arise from anthropogenic sources (Alimonti et al. 2000; Barceloux 1999; EPA 1984a; Johnson et al. 2006; Shanker et al. 2005).

The solubility of chromium compounds varies, depending primarily on the oxidation state. Trivalent chromium compounds, with the exception of acetate, hexahydrate of chloride, and nitrate salts, are generally insoluble in water (Table 4-2). The zinc and lead salts of chromic acid are practically insoluble in cold water (Table 4-2). The alkaline metal salts (e.g., calcium, strontium) of chromic acid are slightly soluble in water. Some hexavalent compounds, such as chromium(VI) oxide (or chromic acid), and the ammonium and alkali metal salts (e.g., sodium and potassium) of chromic acid are readily soluble in water. The hexavalent chromium compounds are reduced to the trivalent form in the presence of oxidizable organic matter. However, in natural waters where there is a low concentration of reducing materials, hexavalent chromium compounds are more stable (EPA 1984a; Loyaux-Lawniczak et al. 2001).

Table 4-1. Chemical Identity of Chromium and Compounds

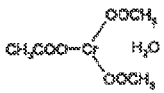
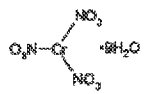
Characteristic	Information		
Chemical name	Chromium(0)	Chromium(III) acetate, monohydrate	Chromium(III) nitrate, nonahydrate
Synonym(s)	Chrome; Chrom (German); Chrome (French)	Acetic acid, chromium salt, hydrate; chromic acetate, hydrate	Nitric acid, chromium (III) salt, nonahydrate; chromium nitrate, nonahydrate
Registered trade name(s)	Chrome	No data	No data
Chemical formula	Cr	$Cr(CH_3COO)_3 \cdot H_2O$	$Cr(NO_3)_3 \cdot 9H_2O$
Chemical structure	Cr		
Identification numbers:			
CAS registry	7440-47-3	25013-52-5	7789-02-8
NIOSH RTECS	GB420000	AG3053333	GB6300000
EPA hazardous waste	D007	No data	No data
OHM/TADS	7216647	No data	No data
DOT/UN/NA/IMDG shipping	Not assigned	No data	No data
HSDB	910	No data	No data
NCI	Not assigned	No data	No data

Table 4-1. Chemical Identity of Chromium and Compounds

Characteristic	Information		
Chemical name	Chromium(III) chloride	Chromium(III) chloride, hexahydrate	Chromite (Cr_2FeO_4) (Chromium[III])
Synonym(s)	Chromium trichloride	Hexaaquachromium (III) chloride	Chromite; chromite ore; chromite homog mineral, chromite (mineral)
Registered trade name(s)	C177295	No data	No data
Chemical formula	$CrCl_3$	$Cr(Cl)_3 \cdot 6H_2O$	$FeCr_2O_4$
Chemical structure		$Cr[Cl_4(H_2O)_4]Cl \cdot 2H_2O$	$FeOCr_2O_3$
Identification numbers:			
CAS registry	10025-73-7	10060-12-5	1308-31-2
NIOSH RTECS	GB5425000	GB5450000	GB4000000
EPA hazardous waste	No data	No data	D007
OHM/TADS	No data	No data	No data
DOT/UN/NA/IMDG shipping	No data	No data	No data
HSDB	No data	No data	2993
NCI	No data	No data	No data

Table 4-1. Chemical Identity of Chromium and Compounds

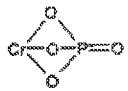
Characteristic	Information		
Chemical name	Chromium(III) oxide	Chromium(III) phosphate	Chromium(III) sulfate
Synonym(s)	Chromium sesquioxide; dichromium trioxide; chromic oxide	Chromium orthophosphate; phosphoric acid, chromium (III) salt	Sulfuric acid, chromium (III) salt
Registered trade name(s)	No data	Amaudon's Green	Chromitan B
Chemical formula	Cr_2O_3	$CrPO_4$	$Cr_2(SO_4)_3$
Chemical structure	O=Cr–O–Cr=O		SO_4=Cr–SO_4–Cr=SO_4
Identification numbers:			
CAS registry	1308-38-9	7789-04-0	10101-53-8
NIOSH RTECS	GB6475000	GB6840000	GB7200000
EPA hazardous waste	D007	No data	D007
OHM/TADS	Not assigned	No data	7800052
DOT/UN/NA/IMDG shipping	Not assigned	No data	Not assigned
HSDB	1619	No data	2543
NCI	Not assigned	No data	Not assigned

Table 4-1. Chemical Identity of Chromium and Compounds

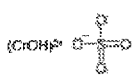
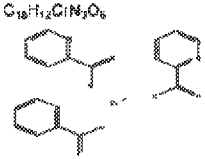
Characteristic	Information		
Chemical name	Sodium chromite (Chromium[III])	Chromium hydroxide sulfate (Chromium III)	Chromium(III) picolinate
Synonym(s)	No data	Chromium hydroxide sulfate ($Cr(OH)(SO_4)$); basic chromium sulfate	CrPic; Chromium 2-pyridinecarboxylate; Chromium tris(picolinate)-; Picolinic acid, chromium salt
Registered trade name(s)	No data	No data	No data
Chemical formula	$NaCrO_2$	$CrOHSO_4$	$C_{18}H_{12}CrN_3O_6$
Chemical structure	NaO–Cr=O		
Identification numbers:			
CAS registry	12314-42-0	12336-95-7	14639-25-9
NIOSH RTECS	No data	GB6240000	No data
EPA hazardous waste	No data	No data	No data
OHM/TADS	No data	No data	No data
DOT/UN/NA/IMDG shipping	No data	No data	No data
HSDB	No data	No data	No data
NCI	No data	No data	No data

Table 4-1. Chemical Identity of Chromium and Compounds

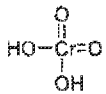
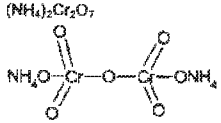
Characteristic	Information		
Chemical name	Chromic acid (Chromium VI)	Chromium(IV) oxide	Ammonium dichromate (Chromium[VI])
Synonym(s)	Acide chromique; chromic(VI) acid	Chromium dioxide	Chromic acid, diamonium salt
Registered trade name(s)	No data	No data	No data
Chemical formula	H_2CrO_4	CrO_2	$(NH_4)_2Cr_2O_7$
Chemical structure		O=Cr=O	
Identification numbers:			
CAS registry	7738-94-5	12018-01-8	7789-09-5
NIOSH RTECS	GB6550000	GB8400000	HX7650000
EPA hazardous waste	No data	D007	Not assigned
OHM/TADS	No data	No data	7217321
DOT/UN/NA/IMDG shipping	1755	No data	UN1439; IM05.1
HSDB	6769	1620	481
NCI	No data	No data	No data

Table 4-1. Chemical Identity of Chromium and Compounds

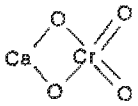
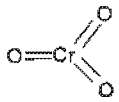
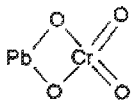
Characteristic	Information		
Chemical name	Calcium chromate (Chromium[VI])	Chromium(VI) trioxide	Lead chromate (Chromium[VI])
Synonym(s)	Chromic acid, calcium salt	Chromic acid, chromium anhydride	Chromic acid, lead salt
Registered trade name(s)	Calcium Chrome Yellow	No data	Chrome Yellow G
Chemical formula	$CaCrO_4$	CrO_3	$PbCrO_4$
Chemical structure			
Identification numbers:			
CAS registry	13765-19-0	1333-82-0	7758-97-6
NIOSH RTECS	GB2750000	GB6650000	GB2975000
EPA hazardous waste	U032; D007	D007	D007; D008
OHM/TADS	7800051	Not assigned	Not assigned
DOT/UN/NA/IMDG shipping	NA9096	YB1463/UN15.1; IM05.1	Not assigned
HSDB	248	518; NA1463	1550
NCI	Not assigned	UN1463	Not assigned

Table 4-1. Chemical Identity of Chromium and Compounds

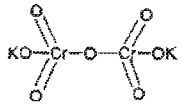
Characteristic	Information		
Chemical name	Potassium chromate (Chromium[VI])	Potassium dichromate (Chromium[VI])	Sodium chromate (Chromium[VI])
Synonym(s)	Chromic acid, dipotassium salt	Chromic acid, dipotassium salt	Chromic acid, disodium salt
Registered trade name(s)	No data	No data	Caswell No. 757
Chemical formula	K2CrO4	$K_2Cr_2O_7$	Na_2CrO_4
Chemical structure			
Identification numbers:			
CAS registry	7789-00-6	7778-50-9	7775-11-3
NIOSH RTECS	GB2940000	HX7680000	GB2955000
EPA hazardous waste	No data	No data	D007
OHM/TADS	7217277	7217278	7216891
DOT/UN/NA/IMDG shipping	NA9142	NA1479; IM09.0	No data
HSDB	1249	1238	2962
NCI	Not assigned	Not assigned	Not assigned

Table 4-1. Chemical Identity of Chromium and Compounds

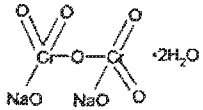
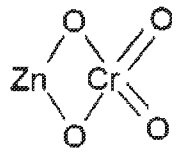
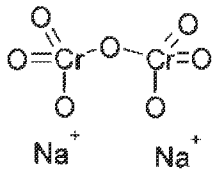
Characteristic	Information	
Chemical name	Sodium dichromate, dihydrate (Chromium[VI])	Strontium chromate (Chromium[VI])
Synonym(s)	Chromic acid, disodium salt; dihydrate	Chromic acid, strontium salt
Registered trade name(s)	No data	No data
Chemical formula	$NaCr_2O_7 \cdot 2H_2O$	$SrCrO_4$
Chemical structure		
Identification numbers:		
CAS registry	7789-12-0	7789-06-2
NIOSH RTECS	HX7750000	GB3240000
EPA hazardous waste	No data	D007
OHM/TADS	No data	7800058
DOT/UN/NA/IMDG shipping	No data	NA9149
HSDB	No data	2546
NCI	No data	Not assigned

Table 4-1. Chemical Identity of Chromium and Compounds

Characteristic	Information	
Chemical name	Zinc chromate (Chromium[VI])	Sodium dichromate (Chromium VI)
Synonym(s)	Chromic acid, zinc salt	Chromic acid ($H_2Cr_2O_7$), sodium salt (1:2)
Registered trade name(s)	CI Pigment Yellow	No data
Chemical formula	$ZnCrO_4$	$Na_2Cr_2O_7$
Chemical structure		
Identification numbers:		
CAS registry	13530-65-9	10588-01-9
NIOSH RTECS	GB3290000	HX7700000
EPA hazardous waste	D007	D007
OHM/TADS	7217401	No data
DOT/UN/NA/IMDG shipping	Not assigned	3288
HSDB	6188	737
NCI	Not assigned	No data

Sources: HSDB 2012; NIOSH 2005

CAS = Chemical Abstracts Services; DOT/UN/NA/IMCO = Department of Transportation/United Nations/North America/International Maritime Dangerous Goods Code; EPA = Environmental Protection Agency; HSDB = Hazardous Substances Data Bank; NCI = National Cancer Institute; NIOSH = National Institute for Occupational Safety and Health; OHM/TADS = Oil and Hazardous Materials/Technical Assistance Data System; RTECS = Registry of Toxic Effects of Chemical Substances

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Chromium	Chromium(III) acetate, monohydrate	Chromium(III) nitrate, nonahydrate	Chromium(III) chloride
Molecular weight	51.996	229.13	400.15	158.35
Color	Steel-gray	Gray-green or bluish-green	Purple or violet	Violet or purple
Physical state	Solid	Solid	Solid	Solid
Melting point	1,90±10 °C	No data	60 °C	≈1,150 °C
Boiling point	2,642 °C	No data	Decomposes at 100 °C	Decomposes at 1,300 °C
Density at 20 °C	7.14 (28 °C)[a]	No data	No data	2.87 (25 °C)[a]
Odor	odorless	No data	No data	No data
Odor threshold:				
Water	No data	No data	No data	No data
Air	No data	No data	No data	No data
Solubility:				
Water at 20 °C	Insoluble	Soluble	Soluble	Slightly soluble in hot water
Organic solvents	Insoluble in common organic solvents	45.4 g/L in methanol (15 °C); 2 g/L in acetone (15 °C)	Soluble in ethanol and acetone	Insoluble in cold water, acetone, methanol, and ether
Partition coefficients:				
Log K_{ow}	Not applicable	Not applicable	Not applicable	Not applicable
Log K_{oc}	Not applicable	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	1 mmHg (1,616 °C)	No data	No data	No data
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data
Explosive limits	No data	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Chromium(III) chloride, hexahydrate	Ferrochromite (Chromium[III])	Chromium(III) oxide	Chromium(III) phosphate
Molecular weight	266.45	223.84	151.99	146.97
Color	Violet	Brown-black	Green	Gray-brown to black[d]
Physical state	Solid	Solid	Solid	Solid
Melting point	83 °C	No data	2,435 °C	>1,800 °C
Boiling point	No data	No data	3,000 °C	No data
Density at 20 °C	1.76[b]	4.97 (20 °C)	5.22 (25 °C)[b]	2.94 (32.5 °C)[a,c]
Odor	No data	No data	No data	No data
Odor threshold:				
Water	No data	No data	No data	No data
Air	No data	No data	No data	No data
Solubility:				
Water at 20 °C	58.5 g/100 cc at 25 °C	Insoluble	Insoluble	Insoluble[c]
Organic solvents	Soluble in ethanol	No data	Insoluble in ethanol	Insoluble in alcohol, acetone
Partition coefficients:				
Log K_{ow}	No data	Not applicable	Not applicable	Not applicable
Log K_{oc}	No data	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	No data	No data	No data	No data
Henry's law constant at 25 °C	No data	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data
Explosive limits	No data	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Chromium(III) sulfate	Sodium chromite (Chromium[III])	Chromium hydroxide sulfate (Chromium III)[e]	Chromium(III) picolinate
Molecular weight	392.18	106.98	165.1	418.3[c]
Color	Violet, red, peach	No data	Green powder	Ruby red[d]
Physical state	Solid	No data	Solid	Crystal[d]
Melting point	No data	No data	>900 °C	No data
Boiling point	No data	No data	No data	No data
Density at 20 °C	3.012	No data	1.25	No data
Odor	No data	No data	No data	No data
Odor threshold:				
Water	No data	No data	No data	No data
Air	No data	No data	No data	No data
Solubility:				
Water at 20 °C	Insoluble	No data	2,000 g/L	1 ppm at 25 °C[d]
Organic solvents	soluble in alcohols	No data	No data	>6 g/L (DMSO)[d]
Partition coefficients:				
Log K_{ow}	Not applicable	Not applicable	Not applicable	1.753[f]
Log K_{oc}	Not applicable	Not applicable	Not applicable	No data
Vapor pressure at 20 °C	No data	No data	No data	No data
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable	No data
Autoignition temperature	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data
Explosive limits	No data	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Chromic acid (Chromium[VI])	Chromium(IV) oxide	Ammonium dichromate (Chromium[VI])
Molecular weight	118	83.99	252.07
Color	Dark purple-red	Brown-black	Orange
Physical state	Solid	Solid	Solid
Melting point	196 °C	Decomposes at 300 °C	Decomposes at 180 °C
Boiling point	Decompose before boiling	Not applicable	Not applicable
Density at 20 °C	1.67–2.82	No data	2.15 (25 °C)[a]
Odor	No data	No data	odorless
Odor threshold:			
Water	No data	No data	No data
Air	No data	No data	No data
Solubility:			
Water at 20 °C	$1x10^6$ mg/L at 17 °C	Insoluble	In water (wt/wt): 15.5% (0 °C); 26.67% (20 °C); 36.99% (40 °C); 46.14% (60 °C); 54.20% (80 °C)
Organic solvents	Soluble in alcohol and mineral acids	No data	Soluble in alcohols, insoluble in acetone
Partition coefficients:			
Log K_{ow}	Not applicable	Not applicable	Not applicable
Log K_{oc}	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	No data	No data	No data
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data
Flashpoint	No data	No data	No data
Flammability limits	No data	No data	No data
Conversion factors	No data	No data	No data
Explosive limits	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Calcium chromate (Chromium[VI])	Chromium(VI) trioxide	Lead chromate (Chromium[VI])	Potassium chromate (Chromium[VI])
Molecular weight	156.07	99.99	323.19	194.19
Color	Yellow	Red	Yellow	Yellow
Physical state	Solid	Solid	Solid	Solid
Melting point	No data	197 °C	844 °C	975 °C
Boiling point	No data	Decomposes	Decomposes	No data
Density at 20 °C	2.89[b]	2.70 (25 °C)	6.12 (15 °C)	2.732 (18 °C)
Odor	No data	Odorless	No data	Odorless
Odor threshold:				
Water	No data	No data	No data	No data
Air	No data	No data	No data	No data
Solubility:				
Water at 20 °C	2.23 g/100 mL	61.7 g/100 cc at 0 °C	5.8 μg/100 mL	62.9 g/100 at 20 °C
Organic solvents	No data	Soluble in ethanol, ethyl ether, sulfuric and nitric acids Soluble 61.7 g/100 cc water (0 °C) 67.45 g/100 cc water (100 °C) 167.299 lb/100 lb water (70 °F) Soluble in acetic acid and acetone	Soluble 0.2 mg/l water Insoluble in acetic acid; soluble in dilute nitric acid and in solution of fixed alkali hydroxides Soluble in acid, insoluble in ammonia	62.9 G/100 cc water (20 °C) 79.2 g/100 cc water (100 °C) Insoluble in alcohol
Partition coefficients:				
Log K_{ow}	Not applicable	Not applicable	Not applicable	Not applicable
Log K_{oc}	Not applicable	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	No data	No data	No data	0
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data
Explosive limits	No data	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Potassium dichromate (Chromium[VI])	Sodium chromate (Chromium[VI])	Sodium dichromate, dihydrate (Chromium[VI])
Molecular weight	294.18	161.97	298.00
Color	Red	Yellow	Red
Physical state	Solid	Solid	Solid
Melting point	398 °C	792 °C	356.7 °C
Boiling point	Decomposes at 500 °C	No data	Decomposes at 400 °C
Density at 20 °C	2.676 (25 °C)	2.710-2.736[b]	2.52 (13 °C)
Odor	No data	No data	No data
Odor threshold:			
Water	No data	No data	No data
Air	No data	No data	No data
Solubility:			
Water at 20 °C	4.9 g/100 cc at 0 °C	87.3 g/100 cc at 30 °C	230 g/100 cc at 0 °C
Organic solvents	Insoluble in ethanol and acetone	Soluble in methanol	Insoluble in ethanol
Partition coefficients:			
Log K_{ow}	Not applicable	Not applicable	Not applicable
Log K_{oc}	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	No data	No data	No data
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data
Flashpoint	No data	No data	No data
Flammability limits	No data	No data	No data
Conversion factors	No data	No data	No data
Explosive limits	No data	No data	No data

Table 4-2. Physical and Chemical Properties of Chromium and Compounds

Property	Strontium chromate (Chromium[VI])	Zinc chromate (Chromium[VI])	Sodium dichromate (Chromium[VI])
Molecular weight	203.61	181.97	262
Color	Yellow	Lemon-yellow	Bright orange-red
Physical state	Solid	Solid	Solid
Melting point	No data	No data	356.7 °C
Boiling point	No data	No data	Decomposes at 400 °C
Density at 20 °C	3.895 (15 °C)	3.40[b]	2.52 at 13 °C
Odor	No data	Odorless	Odorless
Odor threshold:			
Water	No data	No data	No data
Air	No data	No data	No data
Solubility:			
Water at 20 °C	0.12 g/100 cc at 15 °C	Insoluble	2,380 g/L at 0 °C
Organic solvents	Soluble in acetyl acetone	Insoluble in acetone	513.4 g/L (methanol)
Partition coefficients:			
Log K_{ow}	Not applicable	Not applicable	Not applicable
Log K_{oc}	Not applicable	Not applicable	Not applicable
Vapor pressure at 20 °C	No data	No data	No data
Henry's law constant at 25 °C	Not applicable	Not applicable	Not applicable
Autoignition temperature	No data	No data	No data
Flashpoint	No data	No data	No data
Flammability limits	No data	No data	No data
Conversion factors	No data	No data	No data
Explosive limits	No data	No data	No data

[a]Temperature at which the densities were measured has been given only when such data are available
[b]Temperature at which density was measured was not specified.
[c]O'Neil et al. 2006
[d]Broadhurst et al. 1997
[e]IPCS 2004
[f]Chakov et al. 1999

DMSO=dimethylsulfoxide

In humans, chromium(III) is an essential nutrient that may play a role in glucose, fat, and protein metabolism possibly by potentiating the action of insulin. However, there is some emerging controversy whether chromium(III) is essential and more work has been suggested to elucidate its mechanism of action. Chromium picolinate, a trivalent form of chromium complexed with picolinic acid, is used as a dietary supplement, because it is claimed to speed metabolism and may have anti-diabetic effects (Broadhurst et al. 1997). However, there still remains controversy over the use of chromium(III) in diabetes, and several researchers claim no demonstrated effects of chromium(III) on diabetes or insulin resistance (Althuis et al. 2002). Currently, the mechanism of transport and absorption of chromium picolinate has not been determined, although spectroscopic analysis has shown that chromium picolinate is a very stable complex in the body and its absorption properties may be due to its ability to cross membranes (Chakov et al. 1999).

The bioconcentration factor (BCF) for chromium(VI) in rainbow trout (*Salmo gairdneri*) is 1. In bottom-feeder bivalves, such as the oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), and soft shell clam (*Mya arenaria*), the BCF values for chromium(III) and chromium(VI) range from 86 to 192 (EPA 1980, 1984a; Fishbein 1981; Schmidt and Andren 1984). The bioavailability of chromium(III) to freshwater invertebrates (*Daphnia pulex*) decreased with the addition of humic acid (Ramelow et al. 1989). This decrease in bioavailability was attributed to lower availability of the free form of the metal due to its complexation with humic acid. Based on this information, chromium is not expected to biomagnify in the aquatic food chain. Although higher concentrations of chromium have been reported in plants growing in high chromium-containing soils (e.g., soil near ore deposits or chromium-emitting industries and soil fertilized by sewage sludge) compared with plants growing in normal soils, most of the increased uptake in plants is retained in roots, and only a small fraction is translocated in the aboveground part of edible plants (Cary 1982; WHO 1988). Therefore, bioaccumulation of chromium from soil to aboveground parts of plants is unlikely (Petruzzelli et al. 1987). There is no indication of biomagnification of chromium along the terrestrial food chain (soil-plant-animal) (Cary 1982).

The mobility of chromium in soil is dependent upon the speciation of chromium, which is a function of redox potential and the pH of the soil. In most soils, chromium will be present predominantly in the chromium(III) oxidation state. This form has very low solubility and low reactivity, resulting in low mobility in the environment (Barnhart 1997; Jardine et al. 1999; Robson 2003). Under oxidizing conditions, chromium(VI) may be present in soil as CrO_4^{-2} and $HCrO_4^-$ (James et al. 1997). In this form, chromium is relatively soluble and mobile. A leachability study comparing the mobility of several metals, including chromium, in soil demonstrated that chromium had the least mobility of all of the metals studied (Sahuquillo et al. 2003). These results support previous data finding that chromium is not very mobile in soil, especially in the trivalent oxidation state (Balasoiu et al. 2001; Jardine et al. 1999; Lin et al. 1996; Robson 2003). These results are further supported by a leachability investigation in which chromium mobility was studied for a period of 4 years in a sandy loam (Sheppard and Thibault 1991). The vertical migration pattern of chromium in this soil indicated that after an initial period of mobility, chromium forms insoluble complexes and little leaching is observed. Chromium present as insoluble oxide, $Cr_2O_3 \cdot nH_2O$, exhibited limited mobility in soil (Rifkin et al. 2004). Flooding of soils and the subsequent anaerobic decomposition of plant detritus matters may increase the mobilization of chromium(III) in soils due to formation of soluble complexes (Stackhouse and Benson 1989). This complexation may be facilitated by a lower soil pH.

A smaller percentage of total chromium in soil exists as soluble chromium(VI) and chromium(III) complexes, which are more mobile in soil. Chromium that is irreversibly sorbed onto soil (e.g., in the interstitial lattice of geothite, FeOOH) will not be bioavailable to plants and animals under any condition. Organic matter in soil is expected to convert soluble chromate, chromium(VI), to insoluble chromium(III) oxide, Cr_2O_3 (Calder 1988). Surface runoff from soil can transport both soluble and bulk precipitate of chromium to surface water. Soluble and unadsorbed chromium(VI) and chromium(III) complexes in soil may leach into groundwater. The leachability of chromium(VI) in the soil increases as the pH of the soil increases. On the other hand, lower pH present in acid rain may facilitate leaching of acid-soluble chromium(III) complexes and chromium(VI) compounds in soil. Chromium has a low mobility for translocation from roots to aboveground parts of plants (Cary 1982). However, depending on the geographical areas where the plants are grown, the concentration of chromium in aerial parts of certain plants may differ by a factor of 2–3 (Cary 1982).

6.3.2 Transformation and Degradation

6.3.2.1 Air

In the atmosphere, chromium(VI) may be reduced to chromium(III) at a significant rate by vanadium (V^{2+}, V^{3+}, and VO^{2+}), Fe^{2+}, HSO^{3-}, and As^{3+} (EPA 1987b; Kimbrough et al. 1999). Conversely, chromium(III), if present as a salt other than Cr_2O_3, may be oxidized to chromium(VI) in the atmosphere in the presence of at least 1% manganese oxide (EPA 1990b). The estimated atmospheric half-life for chromium(VI) reduction to chromium(III) was reported in the range of 16 hours to about 5 days (Kimbrough et al. 1999).

6.3.2.2 Water

The reduction of chromium(VI) to chromium(III) and the oxidation of chromium(III) to chromium(VI) in water has been investigated extensively. Reduction of chromium(VI) to chromium(III) can occur under suitable conditions in the aqueous environment, if an appropriate reducing agent is available. The most significant reducing agents present in aqueous systems include (in order of decreasing reduction ability) organic matter, hydrogen sulfide, sulfur, iron sulfide, ammonium, and nitrate (Kimbrough et al. 1999). The reduction of chromium(VI) by S^{-2} or Fe^{+2} ions under anaerobic conditions occurs rapidly, with the reduction half-life ranging from instantaneous to a few days (Seigneur and Constantinous 1995). However, the reduction of chromium(VI) by organic sediments and soils was much slower and depended on the type and amount of organic material and on the redox condition of the water. The reduction half-

life of chromium(VI) in water with soil and sediment ranged from 4 to 140 days, with the reaction typically occurring faster under anaerobic rather than aerobic conditions (Saleh et al. 1989). Generally, the reduction of chromium(VI) to chromium(III) is also favored under acidic conditions (Kimbrough et al. 1999).

Oxidation of chromium(III) to chromium(VI) can also occur in the aqueous environment, depending on several factors. Although oxygen is known to oxidize chromium(III) to chromium(VI), dissolved oxygen by itself in natural waters did not cause any measurable oxidation of chromium(III) to chromium(VI) over a period of 128 days (Saleh et al. 1989). When chromium(III) was added to lake water, a slow oxidation of chromium(III) to chromium(VI) occurred, corresponding to an oxidation half-life of nine years. Addition of 50 mg/L manganese oxide accelerated the process, decreasing the oxidation half-life to approximately 2 years (Saleh et al. 1989). The oxidation of chromium(III) to chromium(VI) during chlorination of water was highest in the pH range of 5.5–6.0 (Saleh et al. 1989). However, the process would rarely occur during chlorination of drinking water because of the low concentrations of chromium(III) in these waters, and the presence of naturally occurring organics that may protect chromium(III) from oxidation, either by forming strong complexes with chromium(III) or by acting as a reducing agent to free available chlorine (EPA 1988c). In chromium(III)-contaminated waste waters having pH ranges of 5–7, chlorination may convert chromium(III) to chromium(VI) in the absence of chromium(III)-complexing and free chlorine reducing agents (EPA 1988c).

Chromium speciation in groundwater also depends on the redox potential and pH conditions in the aquifer. Chromium(VI) predominates under highly oxidizing conditions; whereas chromium(III) predominates under reducing conditions. Oxidizing conditions are generally found in shallow, oxygenated aquifers, and reducing conditions generally exist in deeper, anaerobic groundwaters. In natural groundwater, the pH is typically 6–8, and CrO_4^{-2} is the predominant species of chromium in the hexavalent oxidation state, while $Cr(OH)_2^{+1}$ will be the dominant species in the trivalent oxidation state. This species and other chromium(III) species will predominate in more acidic pH; $Cr(OH)_3$ and $Cr(OH)_4^{-1}$ predominate in more alkaline waters (Calder 1988).

6.3.2.3 Sediment and Soil

The fate of chromium in soil is greatly dependent upon the speciation of chromium, which is a function of redox potential and the pH of the soil. In most soils, chromium will be present predominantly in the chromium(III) state. This form has very low solubility and low reactivity resulting in low mobility in the

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium
CAS Number: 007440-47-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	3.0E-3	mg/kg/day	IRIS
Inhal RfD:	2.3E-6	mg/kg/day	IRIS
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:	2.6E-3	mg/kg/day	SPHEM
Inhal ED10 Wgt:	A		
Oral LD50:		mg/kg	
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	2.2E+1	µg/L	ECOTOX
Salt Ecol LC50:	1.0E+3	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	2.3E-1		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	Yes	
Organic:	No	
Gas:	No	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	5.2E+1	
Density:	7.2E+0	g/mL @

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:		atm-m3/mol	
Water Solub:		mg/L	
Distrib Coef:	1.9E+1	ml/g	SSG_KD
Geo Mean Sol:	6.0E+5	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.2E+2		LIVECHEM
Salt BCF:	1.9E+2		LIVECHEM
ENVIRONMENTAL			
Fresh BCF:	1.5E+2		LIVECHEM
Salt BCF:	1.9E+2		LIVECHEM
Log Kow:	2.3E-1		PHYSPROP
Water Solub:			
Geo Mean Sol:	6.0E+5	mg/L	CALC

OTHER DATA

Melting Point:	1.9E+3	C
Boiling Point:	2.7E+3	C
Formula:	Cr	

CLASS INFORMATION

Class	Parent Substance
Chromium:	018540-29-9

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium
CAS Number: 007440-47-3

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		1.9E+1
Geo Mean Sol:		6.0E+5
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	10000
Salt Tox:	100
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:		mg/m3
Non Cancer Risk:	8.3E-6	mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:	1.0E-1	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.1E-1	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:	2.3E+2	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:	1.0E-1	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.1E-1	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:	4.1E+0	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:		µg/L
Salt CMC:		
CHRONIC		
Fresh CCC:		
Salt CCC:		

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium(III)
CAS Number: 018055-83-1

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	1.5E+0		mg/kg/day	IRIS
Inhal RfD:			mg/kg/day	
Oral Slope:			(mg/kg/day)^-1	
Oral Wt-of-Evid:				
Inhal Slope:			(mg/kg/day)^-1	
Inhal Wt-of-Evid:				
Oral ED10:			mg/kg/day	
Oral ED10 Wgt:				
Inhal ED10:			mg/kg/day	
Inhal ED10 Wgt:				
Oral LD50:			mg/kg	
Dermal LD50:			mg/kg	
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	5.7E+2	D, E, K	µg/L	WATCRIT
Salt CMC:			µg/L	
CHRONIC				
Fresh CCC:	7.4E+1	D, E, K	µg/L	WATCRIT
Salt CCC:			µg/L	
Fresh Ecol LC50:			µg/L	
Salt Ecol LC50:			µg/L	

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	Yes	
Organic:	No	
Gas:	No	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	5.2E+1	
Density:	7.1E+0	g/mL @ 7.10 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:		atm-m3/mol	
Water Solub:		mg/L	
Distrib Coef:	1.8E16	ml/g	SSG KD
Geo Mean Sol:	6.0E+5	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	1.2E+2		VER_BCF
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:	1.5E+2		VER_BCF
Log Kow:			
Water Solub:			
Geo Mean Sol:	6.0E+5	mg/L	CALC

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:			

OTHER DATA

Melting Point:	1.9E+3	C
Boiling Point:	2.6E+3	C
Formula:	Cr(3+)	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium(III)
CAS Number: 016065-83-1

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	1
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		1
Water Solub:		
Distrib:		1.8E+6
Geo Mean Sol:		6.0E+5
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-4
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-4

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	1

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	1
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	1
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	100
Salt Tox:	100
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:		mg/m3
Non Cancer Risk:		mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:		mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	5.5E+1	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:	1.2E+5	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/l
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:		mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	5.5E+1	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:	2.0E+3	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:	5.7E+2 [D, E, K]	µg/L
Salt CMC:		µg/L
CHRONIC		
Fresh CCC:	7.4E+1 [D, E, K]	µg/L
Salt CCC:		µg/L

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium(VI)
CAS Number: 018540-29-9

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	3.0E-3		mg/kg/day	IRIS
Inhal RfD:	2.3E-6		mg/kg/day	IRIS
Oral Slope:			(mg/kg/day)^-1	
Oral Wt-of-Evid:				
Inhal Slope:	4.2E+1		(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	A			
Oral ED10:			mg/kg/day	
Oral ED10 Wgt:				
Inhal ED10:	2.6E-3		mg/kg/day	SPHEM
Inhal ED10 Wgt:	A			
Oral LD50:			mg/kg	
Dermal LD50:			mg/kg	
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	1.6E+1	D, K	µg/L	WATCRIT
Salt CMC:	1.1E+3	D, bb	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	1.1E+1	D, K	µg/L	WATCRIT
Salt CCC:	5.0E+1	D, bb	µg/L	WATCRIT
Fresh Ecol LC50:			µg/L	
Salt Ecol LC50:			µg/L	

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:			

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	Yes	
Organic:	No	
Gas:	No	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	5.2E+1	
Density:	7.1E+0	g/mL @ 7.10 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:		atm-m3/mol	
Water Solub:		mg/L	
Distrib Coef:	1.9E+1	ml/g	SSG_KD
Geo Mean Sol:	6.0E+5	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.0E+0		VER_BCF
Salt BCF:	1.9E+2		VER_BCF
ENVIRONMENTAL			
Fresh BCF:	1.0E+0		VER_BCF
Salt BCF:	1.9E+2		VER_BCF
Log Kow:			
Water Solub:			
Geo Mean Sol:	6.0E+5	mg/L	CALC

OTHER DATA

Melting Point:	1.9E+3	C
Boiling Point:	2.6E+3	C
Formula:	Cr(6+)	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Chromium(VI)

CAS Number: 018540-29-9

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		1.9E+1
Geo Mean Sol:		6.0E+5
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5.0
Salt:	500.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	100
Salt Tox:	100
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5.0
Salt:	500.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:	2.0E-7	mg/m3
Non Cancer Risk:	8.3E-6	mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:		mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.1E-1	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:	2.3E+2	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:		mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.1E-1	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:	4.1E+0	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:	1.6E+1 [D, K]	
Salt CMC:	1.1E+3 [D, bb]	
CHRONIC		
Fresh CCC:	1.1E+1 [D, K]	
Salt CCC:	5.0E+1 [D, bb]	