NJD 068715424

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Ortho Clinical Diagnostics, Inc.

2018 ANNUAL REPORT ADDENDUM

Full Scale Enhanced Reductive Dechlorination Activities

Case No. NJD068715424

November 2019

652651

New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program

TRADITIONAL/DIRECT OVERSIGHT REPORT CERTIFICATION FORM

Date Stamp
(For Department use only)

SECTION A. SITE NAME AND LOCATION

Site Name: Ortho Clinical Diagnostics, Inc. Facility

List All AKAs: Ortho-Clinical Diagnostics

Street Address: 1001 US Route 202

Municipality: Raritan (Township Borough or City)

County: Somerset Zip Code: 08869

Program Interest (PI) Number(s): 005882 Case Tracking Number(s): EPA ID: NJD068715424

SECTION B. REPORT INFORMATION

Report Name: 2018 Annual Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities

Report Date: 10/31/2019

Case Type:

☒ **RCRA GPRA 2020** ☐ **CERCLA/NPL** ☐ **USDOD** ☐ **USDOE** ☐ **Direct Oversight**

☐ **Other** (explain):

SECTION C. PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

Full Legal Name of the Person Responsible for Conducting the Remediation: Ortho Clinical Diagnostics, Inc.

Representative First Name: Keith Representative Last Name Wojciechowski

Title: Senior Environmental Engineer

Phone Number: (908) 704-3973 Ext: Fax:

Mailing Address: 1001 US Route 202

City/Town: Raritan State: NJ Zip Code: 08869

Email Address: keith.wojciechowski@orthoclinicaldiagnostics.com

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: Date: 10-31-2019

Name/Title: Keith Wojciechowski/Senior Environmental Engineer

SECTION D. LICENSED SITE REMEDIATION PROFESSIONAL INFORMATION AND STATEMENT

LSRP ID Number: Note: No LSRP - EPA led Site

First Name: _____ Last Name: _____

Phone Numbers: _____ Ext.: _____ Fax: _____

Mailing Address: _____

Municipality: _____ State: _____ Zip Code: _____

Email Address: _____

This statement shall be signed by the LSRP who is submitting this notification in accordance with N.J.S.A. 58:10C-14, and N.J.S.A. 58:10B-1.3b(1) and (2).

(1) I certify, as a Licensed Site Remediation Professional authorized pursuant to N.J.S.A. 58:10C-1 et seq. to conduct business in New Jersey, that for the remediation described in this submission, and all attachments included in this submission, I personally: Managed, supervised, or performed the remediation conducted at this site that is described in this submission, and all attachments included in this submission; and/or periodically reviewed and evaluated the work performed by other persons that forms the basis for the information in this submission; and/or completed the work of another site remediation professional, licensed or not, after having: (1) reviewed all available documentation on which I relied; (2) conducted a site visit and observed the then-current conditions and verified the status of as much of the work as was reasonably observable; and (3)concluded, in the exercise of my independent professional judgment, that there was sufficient information upon which to complete any additional phase of remediation and prepare workplans and reports related thereto.

(2) I certify:

- *That I have read this submission and all attachments to this submission;*
- *That in performing the professional services as the licensed site remediation professional for the entire site or each area of concern, I adhered to the professional conduct standards and requirements governing licensed site remediation professionals provided in N.J.S.A. 58:10C-16;*
- *That the remediation conducted at the entire site or each area of concern, that is described in this submission and all attachments to this submission, was conducted pursuant to and in compliance with the remediation requirements in N.J.S.A. 58:10C-14.c;*
- *That the remediation described in this submission, and all attachments to this submission, was conducted pursuant to and in compliance with the regulations of the Site Remediation Professional Licensing Board at N.J.A.C. 7:26I; and*
- *That the information contained in this submission and all attachments to this submission is true, accurate, and complete.*

(3) I certify, when this submission includes a response action outcome, that the entire site or each area of concern has been remediated in compliance with all applicable statutes, rules, and regulations and is protective of public health and safety and the environment.

(4) I certify that no other person is authorized or able to use any password, encryption method, or electronic signature that the Board or the Department have provided to me.

(5) I certify that I understand and acknowledge that:

- *If I knowingly make a false statement, representation, or certification in any document or information I submit to the Department I may be subject to civil and administrative enforcement pursuant to N.J.S.A. 58:10C-17.a.1(a)through (f) by the Board, including but not limited to license suspension, revocation, or denial of renewal; and*
- *If I purposely, knowingly, or recklessly make a false statement, representation, or certification in any application, form, record, document or other information submitted to the Department or required to be maintained pursuant to the Site Remediation Reform Act, I shall be guilty, upon conviction, of a crime of the third degree and shall, notwithstanding the provisions of subsection b. of N.J.S.2C:43-3, be subject to a fine of not less than $5,000 nor more than $75,000 per day of violation, or by imprisonment, or both.*

(6) I certify that I have read this certification prior to signing, certifying, and making this submission.

LSRP Signature: _____ Date: _____

LSRP Name: N/A - see note above

Company Name: N/A

Completed forms should be sent to:

Assigned Case Manager
Bureau of Case Management
Site Remediation Program
NJ Department of Environmental Protection
401-05F
PO Box 420
Trenton, NJ 08625-0420

2018 ANNUAL REPORT ADDENDUM

Full Scale Enhanced Reductive Dechlorination Activities

Case No. NJD068715424

Prepared for:

Ortho Clinical Diagnostics, Inc.
1001 US 202
Raritan, NJ 08869

Bernhard Preusser
Staff Environmental Scientist

Darren Scillieri
Technical Expert

Jon Rutledge
Project Manager

Prepared by:
10 Friends Lane
Suite 100
Newtown
Pennsylvania 18940
Tel 267 685 1800
Fax 267 685 1879

Our Ref.:
30017429

Date:
November 2019

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APPENDIX

Appendix A Laboratory Analytical Reports

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this Report Addendum for Ortho Clinical Diagnostics, Inc. (OCD) to accompany the 2018 Annual Groundwater Monitoring Report prepared by Langan Engineering and Environmental Services, Inc. (Langan). This Report Addendum describes the activities and results of shallow groundwater remediation efforts conducted during 2018 and provides an update on the results of the full-scale ERD operation at the OCD facility (Site) in Raritan, New Jersey. The Site location is presented on **Figure 1-1**.

1.1 Purpose and Scope

The technology used for remediation of Site groundwater is Enhanced Reductive Dechlorination (ERD), whereby an in situ reactive zone is established in groundwater to enhance the degradation of chlorinated aliphatic hydrocarbons (CAHs). The in situ reactive zone is developed through the delivery of an organic carbon (molasses) solution to the treatment area, producing an anaerobic and reducing groundwater environment in which CAHs are degraded to harmless end products.

1.2 Report Organization

The organization of this Report Addendum is as follows:

- Section 2 describes the Site background;
- Section 3 provides an overview of the full scale remedial system;
- Section 4 presents and analyzes the results of the full-scale system operation;
- Section 5 discusses planned events for the current full scale remedial system and;
- Section 6 provides cited references.

2 SITE BACKGROUND

2.1 Geology/Hydrogeology

The Site is located in the Piedmont Physiographic Province (Triassic Lowlands) of central New Jersey. Geology at the Site is characterized as low permeability silts and clays overlying low permeability bedrock. The uppermost bedrock unit in the area of the Site is the Passaic Formation, which consists of a succession of interbedded non-marine reddish-brown siltstones, mudstones, and shales. Groundwater in the Passaic is confined to vertical and horizontal fractures (bedding partings) due to the low primary porosity of the fine-grained rock matrix. Overlying the bedrock at the Site is a thin veneer (3 to 15 feet thick) of silt and clay overburden, which is a weathering residuum derived from the bedrock.

At the Site, groundwater exists in both shallow and deep bedrock zones. In the shallow bedrock zone, the water level elevations are somewhat variable and do not indicate a consistent gradient across the Site. In general, higher groundwater elevations are observed in the wells located to the north (i.e., MW-36) compared with off-Site monitoring wells to the south (i.e., MW-38, MW-39, and MW-40), indicating a groundwater flow direction to the south. This is consistent with the observed distribution of CAHs to the south. Similar to the shallow bedrock, groundwater flow in the deep bedrock is also to the south – southeast.

Previous aquifer testing completed by Dames and Moore identified low hydraulic conductivities: 0.001 to 0.014 feet per day (ft/day), while aquifer testing conducted by McLaren Hart indicated that hydraulic conductivities ranged from 0.007 to 0.1 ft/day. Given these hydraulic conductivities and a range in hydraulic gradient of approximately 0.02 to 0.05 ft/ft observed across the Site, the groundwater velocity for the shallow bedrock was estimated to be less than 20 feet per year.

2.2 Constituents of Concern

Prior to the initiation of remediation activities, a shallow bedrock plume of dissolved CAHs, primarily consisting of trichloroethene (TCE), was defined on-Site. **Figure 2-1** shows the distribution of TCE based on data collected during the January 2004 sampling event, prior to the implementation of full-scale ERD remediation. As depicted on the figure, the primary area of concern was identified along the central portion of the Site, extending to the south.

The primary source compound in Site groundwater is TCE. TCE degradation daughter products cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC) are also present. Additional chloroethenes present at low concentrations include 1,1-dichloroethene and trans-1,2-dichloroethene. Consistent with the generalized direction of groundwater flow, the CAH plume extends from the central portion of the Site, in the vicinity of MW-36, to the south.

3 FULL-SCALE ERD ACTIVITIES

Based on data collected from the successful ERD pilot study conducted during 2002, a full-scale remedial strategy was developed for remediation of dissolved-phase CAHs above the New Jersey Department of Environmental Protection (NJDEP) Class IIA Groundwater Quality Standards (GWQS) in the shallow bedrock aquifer. In order to implement that strategy, Arcadis completed the installation of a full-scale ERD remediation system at the Site in 2004 and continued to operate the system through 2009. No injections were completed on Site between June 2009 and December 2012, during the renewal of the injection permit. Full-scale ERD activities resumed in January 2013, following the issuance of an interim discharge to groundwater permit-by-rule (DGW-PBR) by NJDEP. A five-year DGW-PBR authorization was issued by NJDEP on September 17, 2013, and injections have continued under this authorization since that time through 2017. The current DGW-PBR expires on July 24, 2017. A request to renew this DGW-PBR was submitted to Steven Urbanik at NJDEP on March 9, 2018, and a public notice was posted in the *Star Ledger* on June 15, 2018, as required by the permit, to continue the existing injection program. As of the date of submittal of this report the request to renew the DGW-PBR is still under NJDEP review. Based on correspondence with and as directed by NJDEP since the submittal of the renewal request, injection and monitoring activities at the site have continued under the requirements of the original permit.

3.1 Full Scale System

The full-scale system consists of injection wells oriented in four transects across the plume to cover the area where TCE concentrations were greater than 10 micrograms per liter (µg/L) in 2004. **Figure 2-1** shows the layout of the full-scale remediation system (Treatment Lines 1 through 4), consisting of 20 reagent injection wells.

3.2 Reagent Injection Program

Molasses injections were initiated at all 20 injection wells in April 2004 (Arcadis, 2005). Injections are currently delivered through a bulk delivery system from a tanker truck. Monitoring data are collected to optimize injection activities and track system performance. These data include the following parameters:

- injection volumes per well,
- concentrations of total organic carbon (TOC) and dissolved gases, and
- CAH trends.

The number of wells included in the injection program has varied over time based on remediation progress and through optimization of the system, which has been based on monitoring results. These efforts have been implemented to continue reducing the footprint of COCs at the Site. **Table 3-1** provides a summary of these injection events. The current focus area of groundwater remediation is in the vicinity of the suspected source area (near MW-36). Injections are also completed at downgradient injection wells to control the flux of degradation daughter products off-Site.

Based on the performance groundwater monitoring data, a total of two injection events were performed in 2018 during May and November. CAH and TOC concentrations collected from quarterly groundwater monitoring events indicated that this injection frequency was sufficient to maintain continued remedial progress via ERD. The source and downgradient areas received injections during both injection events in 2018, and during the reporting period, approximately 9,183 gallons of five percent molasses solution was delivered into the subsurface. The injection volumes placed into each injection well ranged between approximately 146 and 537 gallons for the selected injection well locations during each event (**Table 3-2**).

3.3 ERD Groundwater Monitoring Program

The current monitoring program, which is consistent with the initial strategy for the ERD system, is outlined in the "Discharge to Ground Water Approval – Permit-By-Rule Authorization" letter dated September 17, 2013. The DGW-PBR requires the performance monitoring program to include semi-annual monitoring of selected wells throughout the footprint of the former TCE plume.

OCD's Site-wide groundwater monitoring program, administered by Langan, meets the data needs of the ERD system, with the addition of select parameters at specific wells. Samples collected for OCD's Site-wide groundwater program are obtained via passive diffusion bags (PDBs) and grab sampling. Langan's groundwater program includes the collection of groundwater samples for analysis of volatile organic compounds (VOCs) that include the CAHs of concern at this Site. Additionally, samples are collected for analysis of dissolved gases (ethene, ethane, and methane), TOC, field parameters (pH, oxidation-

reduction potential (ORP), dissolved oxygen (DO), and temperature) and sulfate at select wells per the injection permit and to evaluate ERD performance.

4 FULL SCALE SYSTEM RESULTS

4.1 Organic Carbon Distribution

In order for ERD to be successful, sufficient organic carbon must be distributed throughout the treatment area. Injection wells were installed for the purpose of achieving the target distribution of organic carbon. The distribution of organic carbon is evaluated based on the TOC data obtained from samples collected at select monitoring locations and injection wells (**Table 4-1**). Target TOC concentrations for this Site are considered above background conditions when they are at or above concentrations of 5.0 mg/L in the source area and at measurable concentrations downgradient.

During 2018, TOC concentrations in the source area, which are measured at MW-36 and IMW-2, ranged between 2.5 and 2,800 mg/L. Downgradient area TOC concentrations are tracked at monitoring well MW-34 where results ranged from 1.6 to 2.0 mg/L. The combination of TOC values and continued degradation of TCE and daughter product trends observed in this area indicate that the injection events completed in 2018 have provided a sufficient source of carbon to maintain remedial progress. Continued injections will allow for maintenance of the in situ reactive zone and subsequent control of contaminant flux.

4.2 Enhanced Dechlorination Results

Enhanced reductive dechlorination of TCE is demonstrated by the following:

- an initial decrease in TCE and a subsequent increase in degradation daughter and end-products (cis-1,2-DCE, VC, and ethene), and
- a subsequent decline in daughter products from most complex to least complex.

In this section, the degradation of TCE is evaluated with respect to concentrations of TCE and degradation daughter products observed in the source area and downgradient portions of the plume. CAH results are presented in **Tables 4-1** and **4-2**.

A comparison of the distribution of TCE concentrations in January 2004 and December 2018 is shown on **Figure 2-1.** As shown on this figure, the majority of the on-Site plume area has been remediated to less than 1 µg/L for TCE, as compared to when in 2004 the highest TCE concentration was 28,000 µg/L at MW-36 and the majority of the plume contained concentrations greater than 100 µg/L. Current TCE concentrations outside of the source area on Site are below the NJDEP Class IIA GWQS of 1 µg/L (with the exception of concentrations of 4.9 µg/L and 6.4 µg/L measured in December 2018 at wells MW-28r and MW-29Dr, respectively. MW-28r and MW-29Dr are located at the downgradient edge of the property boundary; however, these results are stable and consistent with recent concentrations of TCE).

Off-Site, TCE concentrations have remained stable to slowly declining, ranging from 14.8 to 19.5 µg/L at monitoring wells MW-39 and MW-40, and below 1 µg/L at the downgradient off-Site sentinel monitoring wells, MW-42 and MW-43. Data for these wells is summarized in **Table 4-1**.

For comparison purposes, relative concentrations of TCE and degradation compounds also are evaluated on a molar basis to confirm the extent of dechlorination reactions. Detailed temporal trends, observed in molar concentrations for TCE and its degradation daughter products, are presented on **Figures 4-1, 4-2, and 4-3,** which represent the source area (MW-36), mid-plume (MW-14r), and distal plume (MW-34) areas, respectively. The results for each of these areas are discussed in further detail below.

Source Area Results

Monitoring Well MW-36 represents conditions immediately downgradient of the suspected source area, which are indicative of the continued dissolution of the adsorbed phase CAH mass from the source area. As shown in **Figure 4-1**, the injection program has successfully enhanced the degradation process in source area monitoring well MW-36. Since resumption of injections in January 2013, TCE concentrations have decreased by more than 99% – from 8,700 µg/L in December 2012 to 6.8 µg/L in December 2018. This reduction in TCE concentrations, coupled with an increase in degradation daughter products (cis-1,2-DCE, VC, and end-product ethene), and later a decrease in cis-1,2-DCE, is evidence of effective degradation of TCE. On a molar basis, cis-1,2-DCE was the dominant constituent as of December 2018. The low-level concentrations of TCE persisting within the source area, at 6.8 µg/L as of December 2018, indicate that the injections have been successful at reducing concentrations of TCE within the source area. Further, the TCE concentration was 922 µg/L at its highest in 2018 in the sample collected during September 2018 – 4 months post the May 2018 injection event. This concentration was reduced to 6.8 µg/L – 1 month post the November 2018 event. These data are consistent with observations from 2017 and indicate that the system is very responsive to the injection program; however, additional injections in this area are necessary to maintain the in situ reactive zone (IRZ) and allow for complete dechlorination to ethene to occur.

Mid-Plume Results

Performance monitoring of the mid-plume area of the TCE plume, downgradient of the suspected source area, continued in 2018 at MW-14r. In 2018, degradation of TCE continued to be observed in the mid-plume area (MW-14r), where TCE remained below the NJDEP GWQS of 1 µg/L during the reporting period. On a molar basis (**Figure 4-2**), VC was the primary constituent in MW-14r, which suggests that CAH flux from the suspected source area is controlled to the mid-plume area and any remaining TCE within the mid-plume is continuing to degrade along the TCE degradation pathway. Additional injections within the source area will continue to control flux of TCE from the suspected source area through the mid-plume area and allow for complete degradation of TCE degradation daughter products to ethene. Monitoring data will continue to be evaluated to determine if additional injections are required in the mid-plume area.

Downgradient-Plume Results

Performance monitoring of the downgradient area of the TCE plume continued in 2018 at MW-34. **Figure 4-3** presents the dechlorination trends in the distal area (MW-34) downgradient of the southern-most treatment line. This well shows the reduction of flux from the Site. Historically, MW-34 contained the highest TCE concentrations downgradient of the source area. Since startup of full-scale operations, TCE has declined from greater than 200 µg/L in 2004 to less than 1 µg/L in September 2018, and has been below the NJDEP GWQS since May 2009. Since this time, the downgradient injection program has targeted elevated daughter product concentrations.

In March 2018, concentrations of cis-1,2-DCE and VC at MW-34 were 1.2 and 2.9 µg/L, respectively. Cis-1,2-DCE and VC increased to 8.9 and 12.6 µg/L, respectively, in September 2018. No sample was collected following the November 2018 injection event; however this data is consistent with the trends observed at this location in 2017. Following the November 2017 injection event, cis-1,2-DCE and VC concentrations declined in MW-34. This demonstrates that the groundwater system responds quickly to injections and with the consequent reducing conditions promoting enhanced degradation and complete dechlorination of TCE and degradation daughter products to ethene (vinyl chloride and ethene were the primary compound observed in this monitoring well on a molar basis). Additional periodic injections in the distal-plume would provide continued maintenance of the IRZ and provide control of potential off-Site migration of TCE and its daughter products. Concentrations of TCE and degradation daughter products also are measured downgradient and at off-Site sentinel wells, MW-42 and MW-43, where concentrations have remained less than 1.0 µg/L for TCE and all daughter products. Monitoring data will continue to be evaluated to determine when additional injections are required in the distal-plume.

Downgradient Deep Wells

At the property boundary, concentrations of TCE in deep wells MW-28Dr and MW-34D have remained near or below the NJDEP Class II GWQS of 1 µg/L (**Table 4-1**). Concentrations of TCE were less than 1 and 3.8 µg/L, respectively, in samples collected from these wells during September 2018. TCE in MW-29Dr continues to be stable with a concentration of 6.4 µg/L in December 2018.

4.3 Conclusions

The overall results from the full-scale ERD operations at the Site are positive, demonstrating continued degradation and control of flux of CAHs in groundwater. Continuation of the injection program in 2018 was necessary to maintain the IRZ and enhance the degradation of TCE and its daughter products in groundwater at the Site. Conclusions based on the data are as follows:

- The extent of the TCE plume has been dramatically reduced in size due to the ERD remediation program.
- The entire shallow on-Site plume outside the source area has TCE concentrations less than 10 µg/L.
- The ability to maintain the appropriate geochemical environment, for ERD to occur in a timely manner, has also been demonstrated (e.g., concentrations of TCE in the source area have been reduced by three orders of magnitude since the injection program was resumed in 2013).
- Decreases in concentrations of TCE, and continued increases and subsequent decreases in daughter products cis-1,2-DCE and VC, in MW-36 are indicative of the successful delivery of carbon injections and continuation of remedial progress in the source area.
- Concentrations of TCE in downgradient wells continue to be declining and are near or below 1 µg/L. Furthermore, concentrations of daughter products have either remained stable or decreased through 2018.
- Concentrations in the deep zone indicate overall stable and/or declining trends for TCE.

- Off-site concentrations of TCE indicate overall stable and/or declining trends for TCE.

The groundwater data indicate that the ERD remediation program has been successful through the continuation of injections in 2018. The data indicate that periodic future injections will maintain the IRZ, which will continue to reduce CAH concentrations in groundwater.

5 PLANNED EVENTS

Full-scale ERD operations will continue in 2019 at select injection wells. Specific activities planned for 2019 are as follows:

- Performance monitoring will continue as outlined in the "Discharge to Ground Water Approval – Permit-By-Rule Authorization" letter dated September 17, 2013 and pending approval of the updated DGW/PBR.
- Arcadis will continue to work with NDJEP to renew the DGW-PBR in 2019 to continue the existing injection program.
- Periodic molasses injections will be completed in 2019 via a bulk tanker and manifold system, as approved by the DGW-PBR for the Site.
    - Source area injections will continue and be optimized to provide active treatment in the area surrounding MW-36. Injection volumes will be modified as necessary to achieve the desired TOC distribution in the MW-36 area, as observed based on groundwater monitoring results. Injection events may be conducted quarterly to semi-annually for injection well treatment lines 1 and 2.
    - Up to two injection events may be completed at downgradient injection well treatment line 4; the frequency and need for future events will be determined based on TOC and CAH results.
- Details and results of the injection activities completed in 2019 will be provided in the 2019 annual report addendum that will be submitted to NJDEP in 2020.

6 REFERENCES

Arcadis, 2003. Enhanced Bioremediation Pilot Study Report and Full-Scale Design, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. July 21, 2003.

Arcadis, 2005. Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. February 2005.

NJDEP, 2005. New Jersey Department of Environmental Protection Field Sampling Procedures Manual, August 2005.

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Arcadis, 2007. Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. April 2007.

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Arcadis, 2015. Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. May 2015.

Arcadis, 2016. Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. September 2016.

Arcadis, 2017. Report Addendum on Full-Scale Enhanced Reductive Dechlorination Activities, Ortho-Clinical Diagnostics, Inc., Raritan, NJ. September 2017.

TABLES

Table 3-1
Molasses Injection Events
2018 Annual Report Addendum
Ortho Clinical Diagnostic, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-1	3/1/02	20	80	10	25-30	--	--	45	100	Trailer
	4/24/02	60	240	10	25-30	--	--	85	300	Trailer
TD = 40'	5/16/02	20	80	10	25-30	--	--	20	100	Trailer
SI = 15 - 40'	8/30/02	60	240	10	25-30	--	--	61	300	Trailer
	1/31/03	20	180	10	25-30	--	--	40	200	Trailer
	5/21/03	20	180	10	25-30	--	--	30	200	Trailer
	8/19/03	20	180	10	25-30	--	--	37	200	Trailer
	11/6/03	20	180	10	25-30	--	--	50	200	Trailer
	4/16/04	20	180	10	25-30	26	5.90	--	200	Trailer
	5/18/04	20	180	10	--	30	5.07	39	200	Trailer
	6/16/04	20	180	10	28	22	3.91	30	200	Trailer
	7/16/04	20	180	10	22	18	--	30	200	Trailer
	9/29/04	20	180	10	32	60	5.03	27	200	Trailer
	12/15/04	25	225	10	6	20	5.92	25	250	Trailer
	7/18/06	7	129	5	10	10	--	24	136	Tanker
	10/25/06	8	154	5	15	18	--	33	162	Tanker
	2/23/07	20	380	5	20	18	--	79	400	Tanker
	9/6/07	25	477	5	24-27	15	--	101	502	Tanker
	4/29/08	30	570	5	18	20	--	100	600	Tanker
	12/18/08	30	570	5	20	--	--	100	600	Tanker
	5/28/09	28	533	5	17	--	--	150	561	Tanker
	1/24/13	30	566	5	--	15	--	158	596	Tanker
	5/22/13	25	475	5	--	--	--	108	500	Tanker
	9/25/13	25	475	5	--	--	--	106	500	Tanker
	12/19/13	25	475	5	--	--	--	100	500	Tanker
	4/9/14	25	475	5	--	16	--	107	500	Tanker
	7/16/14	25	475	5	--	16	--	86	500	Tanker
	10/9/14	25	475	5	--	15	--	113	500	Tanker
	1/29/15	26	500	5	--	15	--	126	526	Tanker
	5/1/15	26	494	5	--	15	--	120	520	Tanker
	8/27/15	25	475	5	--	15	--	110	500	Tanker
	11/5/15	10	190	5	--	15	--	37	200	Tanker
	5/31/16	25	475	5	--	16	--	131	500	Tanker
	11/17/16	25	475	5	--	15	--	117	500	Tanker
	5/31/17	20	380	5	--	16	--	92	400	Tanker
	11/16/17	25	480	5	--	16	--	137	505	Tanker
	5/10/18	25	475	5	--	16	--	140	500	Tanker
	11/8/18	23	428	5	--	14	--	113	450	Tanker
IW-2	3/1/02	20	80	10	25-30	--	--	50	100	Trailer
	4/22/02	60	240	10	25-30	--	--	95	300	Trailer
TD = 40'	5/16/02	20	80	10	25-30	--	--	20	100	Trailer
SI = 15' - 40'	8/30/02	60	240	10	25-30	--	--	61	300	Trailer
	1/31/03	20	180	10	25-30	--	--	40	200	Trailer
	5/21/03	20	180	10	25-30	--	--	30	200	Trailer
	8/19/03	20	180	10	25-30	--	--	38	200	Trailer
	11/6/03	20	180	10	25-30	--	--	45	200	Trailer
	4/16/04	20	180	10	25-30	27	5.93	30	150	Trailer
	5/18/04	20	180	10	27	--	4.32	14	120	Trailer
	6/16/04	20	180	10	25	14	3.74	30	200	Trailer
	7/16/04	20	180	10	20	15	--	18	200	Trailer
	9/29/04	20	180	10	39	46	5.37	42	492	Trailer
	12/15/04	25	225	10	15	15	5.72	43	250	Trailer
	4/18/05	20	380	5	45	41	6.61	80	400	Trailer
	9/28/05	25	475	5	42	14	5.99	21	500	Trailer
	1/18/06	10	190	5	35	30	5.87	30	200	Trailer
	4/18/06	18	333	5	45	31	8.40*	45	350	Trailer
	7/18/06	23	441	5	10	10	--	55	465	Tanker
	10/25/06	32	616	5	15	10	--	68	648	Tanker

Table 3-1
Molasses Injection Events
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Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-2	2/23/07	28	523	5	20	15	--	45	550	Tanker
	9/6/07	25	475	5	14-19	20	--	40	500	Tanker
	4/29/08	28	525	5	20	15	--	45	553	Tanker
	12/18/08	17	321	5	30	18	--	67	338	Tanker
	5/28/09	16	305	5	14	9	--	55	321	Tanker
	1/24/13	30	570	5	--	14	--	116	600	Tanker
	5/22/13	22	414	5	--	--	--	64	436	Tanker
	9/25/13	18	348	5	--	--	--	49	366	Tanker
	12/19/13	17	317	5	--	--	--	45	334	Tanker
	4/9/14	17	317	5	--	14	--	46	334	Tanker
	7/16/14	20	372	5	--	13	--	62	392	Tanker
	10/9/14	21	390	5	--	13	--	65	411	Tanker
	1/29/15	19	359	5	--	15	--	49	378	Tanker
	5/1/15	19	360	5	--	14	--	63	379	Tanker
	8/27/15	22	423	5	--	15	--	68	445	Tanker
	11/5/15	10	190	5	--	13	--	25	200	Tanker
	5/31/16	20	380	5	--	14	--	73	400	Tanker
	11/17/16	20	383	5	--	13	--	84	403	Tanker
	5/31/17	15	285	5	--	11	--	62	300	Tanker
	11/16/17	25	475	5	--	15	--	145	500	Tanker
	5/10/18	25	475	5	--	17	--	95	500	Tanker
	11/8/18	23	428	5	--	16	--	82	450	Tanker
IW-3S	4/16/04	20	180	10	27	32	7.24	70	200	Trailer
	5/18/04	20	180	10	22	32	4.43	--	200	Trailer
	6/16/04	20	180	10	30	30	4.21	30	200	Trailer
	7/16/04	20	180	10	23	20	4.98	30	200	Trailer
	9/29/04	20	180	10	44	34	4.74	37	502	Trailer
	12/15/04	25	225	10	20	20	6.29	22	250	Trailer
	7/18/06	11	216	5	18	15	5.67	43	227	Tanker
	10/25/06	14	263	5	18	18	5.58	53	276	Tanker
	9/6/07	22	427	5	35	20	--	71	450	Tanker
	4/29/08	24	452	5	22	18	--	45	476	Tanker
	12/18/08	11	204	5	30	15	--	96	215	Tanker
	1/28/13	13	244	5	--	14	--	114	257	Tanker
	9/25/13	7	127	5	--	--	--	31	134	Tanker
	12/19/13	8	158	5	--	--	--	33	166	Tanker
	4/9/14	8	158	5	--	13	--	35	166	Tanker
	7/16/14	5	103	5	--	15	--	17	108	Tanker
	8/27/15	15	290	5	--	15	--	105	305	Tanker
	11/5/15	20	380	5	--	15	--	152	400	Tanker
	5/31/16	13	238	5	--	15	--	88	250	Tanker
	11/17/16	6	105	5	--	15	--	17	110	Tanker
	5/31/17	15	285	5	--	16	--	123	300	Tanker
	11/16/17	9	170	5	--	15	--	132	179	Tanker
	5/10/18	10	190	5	--	17	--	50	200	Tanker
	11/8/18	15	285	5	--	17	--	115	300	Tanker
IW-4S	4/16/04	20	180	10	30	31	6.72	45	200	Trailer
	5/18/04	20	180	10	28	29	5.88	--	200	Trailer
	6/16/04	20	180	10	30	25	6.31	40	200	Trailer
	7/16/04	20	30	40	20	18	5.95	10	50	Trailer
	7/16/04	--	150	--	24	22	--	10	150	Trailer
	9/29/04	20	180	10	40	30	5.48	18	200	Trailer
	12/15/04	25	225	10	20	20	5.97	40	250	Trailer
	4/18/05	15	285	5	45	40	6.83	30	300	Trailer
	9/28/05	25	475	5	42	42	5.46	31	500	Trailer
	1/18/06	25	475	5	38	37	5.73	160	500	Trailer
	4/18/06	18	333	5	45	32	8.10*	30	350	Trailer
	9/6/07	8	146	5	20	12	--	17	153	Tanker
	12/18/08	18	333	5	20	15	--	35	350	Tanker
	11/5/15	23	428	5	20	13	--	76	450	Tanker

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Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-4S	5/31/16	13	238	5	--	--	--	38	250	Tanker
	11/17/16	20	380	5	--	15	--	103	400	Tanker
	11/16/17	3	64	5	--	10	--	52	67	Tanker
	5/10/18	20	380	5	--	16	--	55	400	Tanker
	11/8/18	20	380	5	--	15	--	63	400	Tanker
IW-5S	4/16/04	20	180	10	26	29	6.70	30/30	20/10	Trailer
	5/18/04	20	180	10	--	35	5.71	45	50	Trailer
	6/16/04	20	180	10	29	30	5.98	30/30	30/10	Trailer
	7/16/04	20	180	10	25	29	6.17	40	30	Trailer
	9/29/04	20	180	10	60	44	5.44	60	400	Trailer
	12/15/04	25	225	10	15	20	6.42	32	250	Trailer
	4/18/05	20	380	5	45	43	6.53	90	400	Trailer
	9/28/05	7	141	5	42	41	5.89	18	148	Trailer
	1/18/06	15	285	5	31	35	6.08	44	300	Trailer
	4/18/06	15	285	5	45	40	8.03*	40	300	Trailer
	7/18/06	22	422	5	15	18	5.93	71	444	Tanker
	10/25/06	25	475	5	15	15	5.44	94	500	Tanker
	2/23/07	25	477	5	20	13	6.63	88	502	Tanker
	9/6/07	26	485	5	20	14	--	73	511	Tanker
	4/29/08	28	523	5	21	16	--	100	550	Tanker
	12/18/08	29	542	5	20	0-7	--	115	570	Tanker
	5/28/09	28	523	5	12	14	--	119	550	Tanker
	1/24/13	35	671	5	--	14	--	249	706	Tanker
	5/22/13	25	475	5	--	--	--	151	500	Tanker
	9/25/13	25	475	5	--	--	--	125	500	Tanker
	12/19/13	25	475	5	--	--	--	115	500	Tanker
	4/9/14	25	475	5	--	15	--	152	500	Tanker
	7/16/14	26	491	5	--	14	--	139	517	Tanker
	10/9/14	30	570	5	--	15	--	149	600	Tanker
	1/29/15	27	520	5	--	15	--	170	547	Tanker
	5/1/15	28	534	5	--	13	--	157	562	Tanker
	8/27/15	25	475	5	--	15	--	144	500	Tanker
	11/5/15	20	380	5	--	14	--	104	400	Tanker
	5/31/17	30	570	5	--	15	--	202	600	Tanker
	11/16/17	25	483	5	--	17	--	137	508	Tanker
	5/10/18	25	475	5	--	15	--	160	500	Tanker
	11/8/18	23	428	5	--	17	--	133	450	Tanker
IW-6S	4/16/04	20	180	10	24	26	6.82	40/30	30/30	Trailer
	5/18/04	20	180	10	35	42	5.68	35	200	Trailer
	6/16/04	20	180	10	30	35	4.87	20	200	Trailer
	7/16/04	20	180	10	25	20	5.48	21	200	Trailer
	9/29/04	20	180	10	38	26	5.20	17	200	Trailer
	12/15/04	22	194	10	20	20	6.30	40	215	Trailer
	4/18/05	20	380	5	45	40	6.49	35	400	Trailer
	9/28/05	15	276	5	42	22	5.78	18	291	Trailer
	1/18/06	10	190	5	30	30	5.86	--	200	Trailer
	4/18/06	15	285	5	45	29	7.09*	55	300	Trailer
	7/18/06	18	338	5	15	10	6.03	73	356	Tanker
	10/25/06	23	428	5	15	12	5.71	37	451	Tanker
	2/23/07	25	475	5	18	10	6.29	46	500	Tanker
	5/28/09	28	523	5	10	12	--	115	550	Tanker
	1/24/13	30	567	5	--	--	--	142	597	Tanker
	5/22/13	25	475	5	--	--	--	97	500	Tanker
	9/25/13	25	475	5	--	--	--	59	500	Tanker
	12/19/13	25	475	5	--	--	--	70	500	Tanker
	4/9/14	25	475	5	--	15	--	110	500	Tanker
	7/16/14	25	475	5	--	15	--	90	500	Tanker
	10/9/14	25	475	5	--	15	--	108	500	Tanker
	1/29/15	26	494	5	--	15	--	70	520	Tanker
	5/1/15	26	494	5	--	14	--	115	520	Tanker
	8/27/15	25	475	5	--	15	--	116	500	Tanker

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Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-6S	11/5/15	20	380	5	--	15	--	114	400	Tanker
	5/31/16	30	570	5	--	15	--	202	600	Tanker
	11/17/16	30	570	5	--	14	--	240	600	Tanker
	5/31/17	20	380	5	--	16	--	56	400	Tanker
	11/16/17	25	475	5	--	15	--	205	500	Tanker
	5/10/18	25	475	5	--	15	--	95	500	Tanker
	11/8/18	23	428	5	--	17	--	64	450	Tanker
IW-7S	4/16/04	20	180	10	40 - 45	38	7.12	45	200	Trailer
	5/18/04	20	180	10	45	38	5.13	25	200	Trailer
	6/16/04	20	180	10	30	25	6.32	20	200	Trailer
	7/16/04	20	30	40	25	25	7.05	8	50	Trailer
	7/16/04	--	150	--	25	25	--	10	150	Trailer
	9/29/04	20	180	10	23	20	5.61	44	400	Tanker
	12/15/04	25	226	10	40	30	5.38	9	251	Tanker
IW-8S	4/16/04	20	180	10	40 - 45	26	7.32	12	200	Trailer
	5/18/04	20	180	10	20	20	4.98	25	200	Trailer
	6/16/04	20	180	10	26	24	5.84	15	200	Trailer
	7/16/04	20	30	40	23	18	5.83	17	50	Trailer
	7/16/04	--	150	--	23	18	--	10	150	Trailer
	9/29/04	20	180	10	18	18	5.85	24	300	Tanker
	12/15/04	25	226	10	40	21	5.43	8	251	Tanker
	4/18/05	15	285	5	43	26	6.39	14	300	Tanker
	9/28/05	--	--	--	--	--	--	--	--	Tanker
	1/18/06	20	390	5	44	35	6.60	16	410	Tanker
	4/18/06	15	286	5	35	18	10.45*	12	301	Tanker
IW-9S	4/16/04	20	180	10	40 - 45	44	7.10	30	200	Trailer
	5/18/04	20	180	10	29	29	4.78	30	200	Trailer
	6/16/04	20	180	10	29	24	4.74	23	200	Trailer
	7/16/04	20	80	20	29	24	6.50	10	100	Trailer
	7/16/04	--	100	--	26	20	--	10	100	Trailer
	9/29/04	20	180	10	20	20	5.36	28	25	Tanker
	12/15/04	25	226	10	42	38	6.08	8	251	Tanker
IW-10S	4/16/04	20	180	10	40 - 45	40	7.14	20	200	Trailer
	5/18/04	20	180	10	30	30	4.99	15	200	Trailer
	6/16/04	20	180	10	29	24	6.14	30	200	Trailer
	7/16/04	20	80	20	26	22	6.78	10	100	Trailer
	7/16/04	--	100	--	26	22	--	10	100	Trailer
	9/29/04	20	180	10	16	16	5.72	15	200	Tanker
	12/15/04	26	234	10	42	22	5.93	7	260	Tanker
	4/18/05	15	285	5	45	22	6.54	15	300	Tanker
	9/28/05	--	--	--	--	--	--	--	--	Tanker
	1/18/06	10	185	5	40	--	6.20	--	195	Tanker
	4/18/06	15	287	5	40	22	9.03*	12	302	Tanker
	5/28/09	8	159	5	10	10	--	45	167	Tanker
IW-11S	4/16/04	20	180	10	40 - 45	44	7.01	30	200	Trailer
	5/18/04	20	180	10	29	28	5.71	25	200	Trailer
	6/16/04	20	180	10	30	23	5.67	23	200	Trailer
	7/23/04	20	180	10	24	22	5.32	24	200	Trailer
	9/29/04	20	180	10	38	28	6.04	15	200	Tanker
	12/15/04	25	225	10	40	0	5.50	18	250	Tanker
IW-12S	4/16/04	20	180	10	40 - 45	40	7.50	35	10	Trailer
	5/18/04	20	180	10	45	45	4.01	30	25	Trailer
	6/16/04	20	180	10	30	28	3.86	30	25	Trailer
	7/23/04	20	180	10	30	35	6.20	30	30	Trailer
	9/29/04	20	180	10	54	50	5.50	32	200	Tanker
	12/15/04	26	233	10	55	24	6.75	9	259	Tanker

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IW-12S	4/18/05	15	285	5	40	27	6.83	14	308	Tanker
	1/18/06	17	318	5	40	--	7.51	--	335	Tanker
	4/18/06	15	286	5	38	25	8.10*	18	301	Tanker
IW-13S	4/16/04	20	180	10	40 - 45	40	6.63	55	200	Trailer
	5/18/04	20	180	10	31	30	6.38	10	200	Trailer
	6/16/04	20	180	10	23	24	6.10	50	200	Trailer
	7/23/04	20	180	10	29	29	6.24	30	200	Trailer
	9/29/04	20	180	10	23	23	5.86	24	200	Tanker
	12/15/04	25	225	10	59	40	5.69	12	250	Tanker
	4/18/05	15	285	5	42	37	6.64	15	300	Tanker
	9/28/05	20	380	5	40	28	5.73	23	400	Tanker
	1/18/06	22	417	5	42	31	6.16	21	439	Tanker
	4/18/06	21	392	5	40	31	8.97*	22	412	Tanker
	5/23/13	29	544	5	--	16	--	103	573	Tanker
	12/20/13	29	552	5	--	15	--	111	581	Tanker
	8/27/15	25	475	5	--	14	--	87	500	Tanker
	6/1/16	30	570	5	--	14	--	113	600	Tanker
	11/15/17	30	572	5	--	15	--	143	602	Tanker
	11/8/18	25	475	5	--	15	--	88	500	Tanker
IW-14S	4/16/04	20	180	10	40 - 45	35	6.55	30	200	Trailer
	5/18/04	20	180	10	28	28	6.98	30	200	Trailer
	6/16/04	20	180	10	27	24	4.51	20	200	Trailer
	7/23/04	20	180	10	26	24	6.15	25	200	Trailer
	9/29/04	20	180	10	26	26	5.38	22	200	Tanker
	12/15/04	26	234	10	58	30	5.36	9	260	Tanker
	1/28/13	25	475	5	--	14	6.68	124	500	Tanker
	9/25/13	25	475	5	--	--	--	89	500	Tanker
	4/9/14	25	475	5	--	15	--	86	500	Tanker
	6/1/16	25	475	5	--	15	--	113	500	Tanker
	5/31/17	20	380	5	--	16	--	77	400	Tanker
	5/10/18	25	475	5	--	16	--	105	500	Tanker
IW-15S	4/16/04	20	180	10	40 - 45	40	7.07	30	10	Trailer
	5/18/04	20	180	10	45	45	7.48	72	25	Trailer
	6/16/04	20	180	10	28	32	5.43	30	30	Trailer
	7/23/04	20	180	10	30	28	5.76	30	30	Trailer
	9/29/04	20	180	10	70	64	5.57	43	200	Tanker
	12/15/04	26	234	10	59	35	6.01	12	260	Tanker
	4/18/05	20	380	5	42	35	6.55	63	881	Tanker
	9/28/05	25	475	5	40	20	6.28	27	500	Tanker
	1/18/06	22	419	5	45	37	5.72	205	441	Tanker
	4/18/06	22	414	5	40	32	8.47*	22	435	Tanker
	1/24/13	26	485	5	--	14	7	254	511	Tanker
	5/23/13	21	402	5	--	15	--	108	423	Tanker
	12/20/13	20	376	5	--	15	--	116	396	Tanker
	4/9/14	22	415	5	--	16	--	133	437	Tanker
	6/1/16	25	475	5	--	15-16	--	182	500	Tanker
	11/15/17	30	570	5	--	18	--	122	600	Tanker
	11/9/18	25	475	5	--	17	--	124	500	Tanker
IW-16S	4/16/04	20	180	10	40 - 45	40	7.13	20	200	Trailer
	5/18/04	20	180	10	45	38	6.38	35	185	Trailer
	6/16/04	20	180	10	22	20	6.37	30	200	Trailer
	7/23/04	20	180	10	24	20	5.90	20	200	Trailer
	9/29/04	20	180	10	26	22	5.14	45	400	Tanker
	12/15/04	25	227	10	46	26	5.78	10	252	Tanker
	4/18/05	75	1415	5	38	19	6.73	60	1490	Tanker
	9/28/05	51	961	5	40	23	--	40	1012	Tanker
	1/18/06	40	768	5	42	20	6.04	32	808	Tanker
	4/18/06	43	810	5	38	21	8.21*	36	852	Tanker

Table 3-1
Molasses Injection Events
2018 Annual Report Addendum
Ortho Clinical Diagnostic, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-16S	5/28/09	102	1945	5	20	19	6.21	170	2047	Tanker
	1/24/13	27	508	5	--	14	7.51	213	535	Tanker
	9/25/13	25	475	5	--	15	--	111	500	Tanker
	8/27/15	25	471	5	--	15	--	105	496	Tanker
	6/1/16	24	449	5	--	--	--	132	473	Tanker
	5/31/17	10	190	5	--	15	--	33	200	Tanker
	11/15/17	20	380	5	--	15	--	78	400	Tanker
	5/10/18	10	190	5	--	15	--	28	200	Tanker
	11/9/18	7	139	5	--	16	--	21	146	Tanker
IW-17S	4/16/04	20	180	10	40 - 45	38	7.02	30	50	Trailer
	5/18/04	20	180	10	44	45	6.01	45	75	Trailer
	6/16/04	20	180	10	40	40	6.46	30	75	Trailer
	7/23/04	20	180	10	29	20	6.64	30	70	Trailer
	9/29/04	20	180	10	74	76	6.25	50	200	Tanker
	12/15/04	25	225	10	45-56	45-56	5.58	54	250	Tanker
	4/18/05	10	193	5	38	44	6.59	60	203	Tanker
	9/28/05	25	476	5	40	40	--	70	501	Tanker
	1/18/06	41	772	5	44	32	--	35	813	Tanker
	4/18/06	48	903	5	39	37	9.52*	46	951	Tanker
	1/24/13	23	438	5	--	14	7	193	461	Tanker
	5/22/13	25	475	5	--	15	--	152	500	Tanker
	12/19/13	25	475	5	--	16	--	131	500	Tanker
	6/1/17	30	570	5	--	17	--	229	600	Tanker
	5/10/18	25	475	5	--	17	--	154	500	Tanker
IW-18S	4/16/04	20	180	10	--	30	6.59	70	200	Trailer
	5/18/04	20	180	10	36	36	5.91	20	200	Trailer
	6/16/04	20	180	10	39	40	6.33	20	200	Trailer
	7/23/04	20	180	10	30	32	6.60	24	200	Trailer
	9/29/04	20	180	10	36	30	5.87	22	200	Tanker
	12/15/04	0	0	--	--	--	6.31	--	0	--
	5/28/09	19	352	5	12	10	6.78	140	370	Tanker
	9/26/13	24	465	5	--	15	--	100	489	Tanker
	4/9/14	25	475	5	--	16	--	116	500	Tanker
	8/27/15	13	238	5	--	15	--	55	250	Tanker
	6/1/16	20	380	5	--	14	--	78	400	Tanker
	11/15/17	30	570	5	--	16	--	112	600	Tanker
	11/8/18	25	475	5	--	15	--	120	500	Tanker
IW-19S	4/16/04	20	180	10	40 - 45	40	6.72	25	200	Trailer
	5/18/04	20	180	10	45	38	5.83	15	200	Trailer
	6/16/04	20	180	10	45	45	5.89	20	190	Trailer
	7/23/04	20	180	10	--	--	6.44	--	--	--
	9/29/04	20	180	10	21	21	5.13	13	200	Tanker
	12/15/04	25	226	10	46	18	6.59	10	251	Tanker
	4/18/05	15	292	5	40	17	6.83	12	307.4	Tanker
	9/28/05	20	388	5	40	20	--	19	408	Tanker
	1/18/06	21	392	5	42	20	7.09	15	413	Tanker
	4/18/06	20	382	5	38	21	9.07*	46	402	Tanker
	1/28/13	17	326	5	--	14	--	93	343	Tanker
	12/19/13	25	475	5	--	15	--	88	500	Tanker
	8/27/15	25	475	5	--	14	--	80	500	Tanker
	6/1/17	30	570	5	--	17	--	84	600	Tanker
	5/10/18	27	510	5	--	10	--	92	537	Tanker

Table 3-1
Molasses Injection Events
2018 Annual Report Addendum
Ortho Clinical Diagnostic, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Raw Molasses (gallons)	Water Volume (gallons)	Solution Strength %	Pressure at Pump (psi)	Pressure at Well (psi)	pH	Injection Time (Minutes)	Total Volume Injected (gallons)	Injection Method
IW-20S	4/16/04	20	180	10	40 - 45	40	6.48	60	70	Trailer
	5/18/04	20	180	10	45	45	5.38	25	200	Trailer
	6/16/04	20	180	10	45	45	4.42	15	200	Trailer
	7/23/04	20	180	10	24	16	4.69	22	200	Trailer
	9/29/04	20	180	10	25	20	5.81	21	200	Tanker
	12/15/04	26	231	10	55	28	5.21	9	257	Tanker
	5/22/13	26	503	5	--	13-14	--	125	530	Tanker
	9/26/13	25	475	5	--	15-16	--	75	500	Tanker
	4/9/14	25	475	5	--	16	--	82	500	Tanker
	6/1/16	25	475	5	--	13	--	87	500	Tanker
	6/1/17	10	190	5	--	15	--	49	200	Tanker
	11/15/17	20	380	5	--	14	--	75	400	Tanker
	5/10/18	10	190	5	--	15	--	35	200	Tanker
	11/9/18	25	475	5	--	17	--	96	500	Tanker

Notes:

-- Not measured
psi Pounds per square inch
* pH probe calibration error

Table 3-2
Volume of Molasses Solution Injected in Select Wells (2018)
2018 Annual Report Addendum
Ortho Clinical Diagnostics, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Injection Event		Total Volume Injected 2018 (gallons)
	May-18 (gallons)	Nov-18 (gallons)	
IW-1	500	450	950
IW-2	500	450	950
IW-3S	200	300	500
IW-4S	400	400	800
IW-5S	500	450	950
IW-6S	500	450	950
IW-13S	0	500	500
IW-14S	500	0	500
IW-15S	0	500	500
IW-16S	200	146	346
IW-17S	500	0	500
IW-18S	0	500	500
IW-19S	537	0	537
IW-20S	200	500	700
Total	4,537	4,646	**9,183**

Table 4-1
Full Scale ERD Monitoring Well Data
2018 Annual Report Addendum
Ortho Clinical Diagnostics, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IMW-1	2/21/2002	7.62	129.0	1.08	853	19.10	--	--	1.3	--	1270	<25	<5	1.7	26	38
	4/2/2002	6.86	-102.0	0	2,510	22.49	--	--	1,070	--	--	--	--	--	--	--
	5/29/2002	4.44	-37.0	0	8,040	21.46	--	--	18,500	--	76.9	268	<58	65	19	64
	8/9/2002	5.78	-64.0	12.27	2,300	21.89	--	--	844	--	<50	549	<50	16,000	25	440
	11/5/2002	4.35	-66.0	1.13	9,400	20.74	--	--	27,000	--	<50	377	<50	--	--	--
	12/9/2002	4.70	-93.0	1.20	4,860	18.60	--	--	4,900	--	47.7	189	13.1	680	370	260
	1/14/2003	4.69	-3.0	1.79	5,090	19.82	--	--	4,200	--	--	--	--	--	--	--
	3/4/2003	5.72	-93.0	17.31	7,010	17.99	--	--	5,810	--	30.3	134	71.7	2,300	--	--
IMW-2	2/21/2002	7.14	34.0	0.84	822	19.30	--	--	2	--	808	<25	<5	1.6	2,600	4,100
	4/2/2002	8.20	-169.0	0	5,960	19.39	--	--	--	--	--	--	3.5	--	--	--
	5/29/2002	6.17	-165.0	0	2,050	22.58	--	--	381	--	<5	471	<5.8	230	450	840
	8/9/2002	6.80	-154.0	1.74	1,220	25.58	--	--	27.4	--	1.4	280	2.6	24,000	180	770
	11/5/2002	6.44	-190.0	0.28	2,980	20.94	--	--	1,100	--	<5	173	64.3	--	-	-
	12/9/2002	5.48	-127.0	1.97	3,880	9.48	--	--	1,700	--	<5	110	29.6	7,300	80	1,400
	1/14/2003	6.50	-136.0	0.76	1,970	15.47	--	--	213	--	--	--	--	--	--	--
	3/4/2003*	6.97	-229.0	5.18	3,100	19.31	--	--	700	--	<10	<50	20.6	23,000	1,000	28,000
	5/6/2004	6.85	--	0.10	1,010	15.10	--	--	1,400	2.6	200	4.7	2.8	13,000	8,000	1,200
	8/10/2004	--	--	--	--	--	--	<20	1,050	0.37	0.52	3	1.3	24,000	700	<10
	11/17/2004	6.20	-104.0	4.61	2,990	20.59	--	--	1,500	0	0	2	1.4	15,000	340	230
(32.5)	2/15/2006	--	--	--	--	--	--	--	6.2	<0.6	1.1	1.3J	2.7	--	--	--
(32.5)	5/18/2006	6.46	--	--	--	--	--	--	<5.0	<0.6	<0.8	<1.0	1	8,800	7,200	410
(32.5)	8/22/2006	6.20	-101.2	0.12	3,617	18.71	--	--	440	<0.4	<0.3	<0.2	<0.2	25,000	1,900	190
(32.5)	11/14/2006	5.65	-88.2	1.09	3,069	18.66	--	--	840	<0.4	<0.3	1.9	1.2	15,000	4,200	310
	2/13/2007	6.14	-120.5	0.22	1,852	19.00	--	--	7.6	<0.3	<0.5	2.3	2.1	25,000	13,000	610
	8/28/2007	5.92	-11.7	0.21	2,050	22.93	--	--	6.2	<0.4	<0.3	0.7	0.4	25,000	3,800	70
	11/27/2007	--	--	--	--	--	--	--	75	<1	<1	1 J	<1	23,000	400	120
	3/4/2008	6.32	-48.7	0.64	9,282	16.33	--	--	--	<0.46	0.36	1.5	0.93	--	--	--
	5/20/2008	4.84	-29.6	0.51	4,897	17.44	--	--	3,700	0.3J	0.5	2.6	1.7	6,800	3,000	170
	9/3/2008	6.34	-148.2	3.39	4,796	18.07	--	--	67	<0.26	0.34	1.5	0.66	21,000	230	80
	12/2/2008	6.05	-193.0	0.22	1,277	19.35	--	--	<5.0	<0.17	<0.15	<0.22	<0.16	16,000	5,700	130
	3/5/2009	5.87	-102.9	1.62	6,363	18.01	--	--	2,600	<0.29	<0.28	2.0	0.53	20,000	2,400	450
	5/19/2009	6.09	-52.9	1.66	5,007	16.92	--	--	29	<0.29	<0.28	1.6	0.38	26,000	940	88
	8/13/2009	6.29	-65.3	0.39	3,617	19.55	--	--	100	<1.4	<1.4	<1.0	<0.85	20,000	490	460
	11/18/2009	6.26	-161.6	0.66	4,731	20.86	--	--	<5.0	<0.29	0.21J	1.5	0.83	30,000	11,000	290
	3/9/2010	6.01	-56.4	0.27	1,091	15.39	--	--	<5.0	<0.29	<0.28	2.6	2.8	14,000	10,000	1,300
	5/26/2010	6.30	-144.2	0.05	1,820	17.21	--	--	<2.0	<0.21	<0.17	5.6	6.3	7,000	8,000	1,800
	8/31/2010	6.39	-85.1	0.41	1,270	18.68	--	--	2.8	<0.21	<0.17	7.1	8.3	6,200	10,000	2,400
	12/6/2010	6.38	-101.1	0.64	1,305	19.05	--	--	2.3	<0.21	<0.17	6.1	6.6	13,000	23,000	2,600
	3/22/2011	6.50	-20.8	4.23	5,475	16.26	--	--	1.6	<0.21	<0.17	11	13	6,300	10,000	4,500
	5/25/2011	6.46	5.6	0.13	3,660	17.53	--	--	2.7	<0.21	<0.17	13	12	5,100	10,000	3,800
	9/15/2011	6.46	-70.4	0.11	2,650	18.01	--	--	2	<0.10	<0.12	9	9.9	4,800	9,100	4,100
	12/22/2011	6.28	-92.5	0.29	2,476	19.28	--	--	3.1	<0.14	0.74 J	8.1	7.7	6,800	13,000	4,100
(17-18.5)	4/4/2012	6.38	-135.9	1.02	2,350	16.30	--	--	1.5	<1.0	0.29 J	17	13	5,400	13,000	3,900
(22-23.5)	4/4/2012	6.38	-135.9	1.02	2,350	16.30	--	--	2.5	<1.0	<1.0	11	9.6	5,400	13,000	3,900
(27-28.5)	4/4/2012	6.38	-135.9	1.02	2,350	16.30	--	--	3.5	<1.0	<1.0	11	9.1	5,400	13,000	3,900
(32-33.5)	4/4/2012	6.38	-135.9	1.02	2,350	16.30	--	--	4.5	<1.0	<1.0	11	9.7	5,400	13,000	3,900
(37-38.5)	4/4/2012	6.38	-135.9	1.02	2,350	16.30	--	--	5.5	<1.0	<1.0	8.5	7.3	5,400	13,000	3,900
	6/13/2012	6.48	-68.6	0.50	2,410	18.18	--	--	3.0	--	--	--	--	4,000	12,000	4,200
	8/31/2012	6.77	-49.1	0.76	1,972	19.22	--	--	1.3	<1.0	<1.0	12	15	4,500	12,000	6,500
	12/19/2012	6.47	-11.4	0.43	2,140	18.62	--	--	3.0	<1.0	<1.0	16	15	5,500	12,000	6,500
	3/6/2013	6.45	-91.9	1.18	4,236	18.66	--	--	1,900	<1.0	<1.0	0.67 J	0.67 J	13,000	9,200	190

Table 4-1
Full Scale ERD Monitoring Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IMW-2	5/16/2013	6.36	-228.9	0.68	4,170	18.35	--	--	334	<1.0	<1.0	0.22 J	<1.0	15,000	2,600	86
	9/23/2013	6.42	-95.8	0.09	3,836	19.67	--	--	196	<1.0	<1.0	0.51 J	<1.0	21,000	1,000	27 J
	12/16/2013	5.20	-50.0	1.58	4,370	18.20	--	--	56.7	<1.0	<1.0	0.70 J	<1.0	22,000	500	85
	4/2/2014 diluted	6.28	-128.7	0.11	11,830	17.11	--	--	196	<10	<10	1.0 J	<10	24,000	380	12 J
	6/11/2014 (dil.)	6.09	-91.9	0.91	8,862	16.79	--	--	342	<5.0	<5.0	1.9 J	<5.0	19,000	2,100	420
	8/28/2014	5.90	-134.6	1.91	7,950	19.01	--	--	546	<1.0	<1.0	0.78 J	<1.0	17,000	470	63
	12/8/2014	5.93	-90.5	0.81	5,260	19.73	--	--	266	<1.0	<1.0	1.13	<1.0	22,000	370	95
	4/7/2015	6.21	-108.0	0.14	15,950	15.67	--	--	350	<1.0	<1.0	0.786 J	0.532 J	18,000	1,200	66
	6/30/2015	4.82	17.9	1.68	13,170	17.73	--	--	1,800	<1.0	<1.0	0.77 J	<1.0	12,000	570	120 J
	10/5/2015	3.77	106.1	0.02	9,867	18.04	--	--	1,400	<1.0	<1.0	0.63 J	0.45 J	13,000	330	32 J
	12/21/2015	6.42	14.3	0.04	7,645	18.67	--	--	140	<1.0	<1.0	0.50 J	0.56 J	17,000	280	2 J
	3/31/2016	5.99	-74.3	0.23	4,915	17.45	--	--	7	<1.0	<1.0	1.3	0.85 J	15,000	2,600	210
	3/31/2016 (DUP)	5.99	-74.3	0.23	4,915	17.45	--	--	7	<1.0	<1.0	1.4	0.82 J	15,000	2,600	210
	7/7/2016	4.96	-80.9	0.69	4,957	18.57	--	--	1,600	<1.0	<1.0	0.73 J	0.43 J	15,000	1,500	200
	9/28/2016	5.94	-5.8	1.10	5,630	14.27	--	--	26	<1.0	<1.0	0.65 J	<1.0	14,000	1,600	62 J
	12/21/2016	4.68	-98.8	0.67	6,297	19.36	--	--	4,900	<1.0	<1.0	0.70 J	0.46 J	11,000	430	66 J
	4/10/2017	5.96	-74.8	0.07	7,595	17.83	--	--	69	<1.0	<1.0	0.35 J	<1.0	22,000	4,600	85 J
	7/6/2017	5.01	-1.6	0.15	5,834	18.92	--	--	2,000	<1.0	<1.0	0.85 J	1.7	13,000	920	130 J
	9/28/2017	6.36	-147.3	2.22	5,120	21.05	--	--	117	<1.0	<1.0	0.87 J	<1.0	22,000	230	33 J
	12/14/2017	4.83	52.1	0.62	5,008	19.23	--	--	2,500	<1.0	<1.0	1.1	<1.0	8,600	300	72
	3/29/2018	6.38	-96.1	0.12	5,659	16.93	--	--	110	--	--	--	--	--	--	--
	4/18/2018	--	--	--	--	--	--	--	--	--	--	--	--	16,000	1,700	160 J
	6/20/2018	4.53	-77.8	0.61	6,852	18.22	--	--	2,800	<1.0	<1.0	<1.0	1.5	14,000	1,300	420
	9/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/4/2018	5.69	71.8	0.42	10	12.02	--	--	2,400	<1.0	<1.0	<1.0	<1.0	9,700	500	96 J
IMW-3	2/21/2002	7.16	127.0	1.09	663	17.40	--	--	6.5	--	2,280	<100	<20	11	75	400
	4/2/2002	8.39	-213.0	0	1,620	21.23	--	--	303	--	--	--	--	--	--	--
	5/29/2002	5.32	-81.0	0	2,800	21.14	--	--	2,380	--	174	1,240	<29	120	58	190
	8/9/2002	6.68	-111.0	2.21	1,370	21.37	--	--	104	--	6.3	460	52.6	21,000	36	600
	11/5/2002	6.07	-82.0	0	2,640	20.18	--	--	990	--	39.2	286	241	--	-	-
	12/9/2002	6.45	-210.0	0.61	2,390	19.11	--	--	430	--	<2	67	179	15,000	90	25,000
	1/14/2003	6.86	-148.0	0.67	3,310	17.59	--	--	204	--	--	--	--	--	--	--
	3/4/2003	5.17	-53.0	4.90	4,810	17.66	--	--	3,510	--	22.9	50.9	18.8	9,300	2,900	13,000
MW-10**	9/1/1999	--	--	--	--	--	--	--	--	3	2	31	<2.0	--	--	--
	1/14/2004	7.50	1.3	2.82	707	13.66	--	--	29	--	--	--	--	--	--	--
	8/10/2004	--	--	--	--	--	--	--	28.3	--	--	--	--	--	--	--
	2/8/2005	7.56	--	--	433	19.48	--	28	--	--	--	--	--	--	--	--
	5/10/2005	7.59	-135.9	0.07	367	19.44	--	35	--	--	--	--	--	--	--	--
	8/10/2005	6.52	--	--	--	19.55	--	26	--	--	--	--	--	--	--	--
	10/27/2005	7.22	--	--	--	18.85	--	28	--	--	--	--	--	--	--	--
	5/18/2006	5.33	--	--	--	--	--	27	--	--	--	--	--	--	--	--
	8/22/2006	6.88	--	--	493	19.15	--	27	--	--	--	--	--	--	--	--
	11/14/2006	7.63	--	--	420	19.64	--	29	--	--	--	--	--	--	--	--
	2/13/2007	7.96	--	--	--	18.33	--	27	--	--	--	--	--	--	--	--
	8/29/2007	7.65	--	--	--	18.40	--	31	--	--	--	--	--	--	--	--
	3/4/2008	7.57	--	--	--	19.33	--	--	--	--	--	--	--	--	--	--
	5/20/2008	7.05	--	--	--	18.58	--	26	--	--	--	--	--	--	--	--
	9/3/2008	7.31	--	--	--	18.53	--	25	--	--	--	--	--	--	--	--
	12/2/2008	7.39	--	--	--	19.25	--	30	--	--	--	--	--	--	--	--
	3/5/2009	7.35	--	--	--	18.96	--	28	--	--	--	--	--	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Ortho Clinical Diagnostics, Raritan, New Jersey

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-10**	5/19/2009	7.17	--	--	--	18.67	--	25	--	--	--	--	--	--	--	--
	8/13/2009	6.85	--	--	--	20.14	--	28	--	--	--	--	--	--	--	--
	11/18/2009	7.13	--	--	--	20.86	--	28	--	--	--	--	--	--	--	--
	3/9/2010	7.04	--	--	--	17.19	--	30	--	--	--	--	--	--	--	--
	5/26/2010	6.97	--	--	--	19.66	--	29	--	--	--	--	--	--	--	--
	8/31/2010	6.14	--	--	--	19.36	--	28	--	--	--	--	--	--	--	--
	12/6/2010	6.92	--	--	--	19.36	--	29	--	--	--	--	--	--	--	--
	3/22/2011	7.07	--	--	--	19.44	--	27	--	--	--	--	--	--	--	--
	5/25/2011	6.99	--	--	--	19.52	--	28	--	--	--	--	--	--	--	--
	9/15/2011	7.17	--	--	--	--	--	28	--	--	--	--	--	--	--	--
	12/22/2011	6.55	--	--	--	20.50	--	28	--	--	--	--	--	--	--	--
	4/4/2012	6.96	--	--	--	17.51	--	27	--	--	--	--	--	--	--	--
	6/13/2012	7.06	--	--	--	19.65	--	28	--	--	--	--	--	--	--	--
	8/30/2012	7.36	--	--	--	19.52	--	27	--	--	--	--	--	--	--	--
	12/19/2012	7.55	--	--	--	19.15	--	28	--	--	--	--	--	--	--	--
	3/6/2013	6.93	--	--	--	19.98	--	27	--	--	--	--	--	--	--	--
	5/16/2013	7.21	--	--	--	19.62	--	24	--	--	--	--	--	--	--	--
	9/23/2013	7.16	--	--	--	19.43	--	28	--	--	--	--	--	--	--	--
	12/16/2013	6.98	--	--	--	19.58	--	26	--	--	--	--	--	--	--	--
	4/2/2014	7.16	--	--	--	19.72	--	28	--	--	--	--	--	--	--	--
	6/11/2014	6.75	--	--	--	19.04	--	26	--	--	--	--	--	--	--	--
	8/28/2014	6.95	--	--	--	19.68	--	26	--	--	--	--	--	--	--	--
	12/8/2014	7.00	--	--	--	19.76	--	26	--	--	--	--	--	--	--	--
	4/7/2015	7.19	--	--	--	19.59	--	26	--	--	--	--	--	--	--	--
	6/30/2015	6.86	--	--	--	19.55	--	26	--	--	--	--	--	--	--	--
	10/5/2015	7.27	--	--	--	19.76	--	26	--	--	--	--	--	--	--	--
	12/21/2015	--	--	--	--	--	--	27	--	--	--	--	--	--	--	--
	7/6/2016	7.39	--	--	--	19.77	--	--	--	--	--	--	--	--	--	--
	12/21/2016	7.13	--	--	--	20.23	--	25	--	--	--	--	--	--	--	--
	7/6/2017	7.16	--	--	--	20.20	--	24	--	--	--	--	--	--	--	--
	12/14/2017	6.88	--	--	--	19.02	--	26	--	--	--	--	--	--	--	--
	3/29/2018	7.06	--	--	--	20.40	--	27	--	--	--	--	--	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/5/2018	7.36	--	--	--	19.74	--	26	--	--	--	--	--	--	--	--
	12/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14*	8/14/1998	--	--	--	--	--	--	--	--	<5	43	32	19	--	--	--
	9/2/1999	--	--	--	--	--	--	45.2	1.8	<1.0	25	13	9.4	2,210	683	5,293
MW-14r	1/13/2004	7.44	28.0	1.01	271	11.21	--	--	<5	<0.37	15	9.4	7.7	1,200	810	1,300
	5/6/2004	--	--	--	--	--	--	--	<5	3.4	2.3	22	9.8	1,100	1,200	3,100
	8/10/2004	--	--	--	--	--	--	21.9	19.7	0.37	1	4	1.6	14,000	5,100	2,200
	11/17/2004	5.04	-23.0	1.91	1,760	17.29	--	--	<5.0	0	1.1	9.2	5.5	19,000	5,300	6,100
	2/9/2005	6.52	-85.3	0.70	1,425	15.92	--	<1.0	6.7	<0.4	<0.5	3.5	2.6	17,000	3,200	1,200
	5/9/2005	6.53	-91.6	0.29	764	15.09	--	15	11	<0.4	4	9	6	18,000	4,800	4,700
	8/11/2005	6.14	-62.8	0.82	1,607	15.69	--	--	6.5	<0.4	1.3	15	8.2	8,600	2,400	3,900
	10/27/2005	6.58	-63.7	0.38	891	15.46	--	--	<5.0	<0.6	1	19	19	12,000	5,200	13,000
	2/15/2006	6.69	-62.1	0.24	1,420	16.42	--	--	<5.0	<0.6	<0.8	8.6	5.1	24,000	4,900	6,600
	5/18/2006	5.72	--	--	--	--	--	--	<5.0	<0.6	<0.8	21	9.4	--	--	--
	8/22/2006	6.90	-51.1	0.42	880	16.97	--	--	<5.0	<0.4	1.8	22	12	17,000	4,300	5,900
	11/14/2006	6.99	-161.1	0.20	995	17.46	--	--	<5.0	<0.4	<0.3	7.8	5.3	11,000	2,500	2,200
	2/13/2007	6.39	-105.8	0.45	1,578	16.60	--	--	<5.0	<0.3	<0.5	19	6.1	11,000	3,700	2,000
	5/15/2007	--	--	--	--	--	--	--	--	<0.4	0.4 J	7.8	3.8	--	--	--

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Full Scale ERD Monitoring Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-14r	8/29/2007	6.35	-39.9	1.99	2,339	18.51	--	--	6.4	<0.4	0.7	7.6	3.8	10,000	3,000	1,400
	11/27/2007	--	--	--	--	--	--	--	--	<1	1 J	6.5	3.9	14,000	2,600	1,600
	3/3/2008	6.72	-92.6	2.15	1,765	15.35	--	--	--	<0.46	0.6	10	4.4	--	--	--
	5/20/2008	6.33	-0.7	0.47	2,618	14.41	--	--	5.1	<0.3	0.4J	11	5	6,300	3,000	1,600
	9/3/2008	6.56	-84.5	1.66	1,671	15.80	--	--	5.3	<0.26	0.3	11	5.8	9,000	4,200	2,100
	12/2/2008	6.54	-150.1	0.77	1,810	16.40	--	--	<5.0	<0.2	<0.1	9.7	4.8	9,200	4,800	2,500
	3/5/2009	6.85	105.8	0.68	1,834	15.68	--	--	<5.0	<0.29	<0.28	14	7.4	10,000	4,600	2,800
	5/19/2009	6.07	-19.6	1.07	2,669	14.52	--	--	<5.0	<0.29	<0.28	9.7	5.5	9,200	4,700	2,700
	8/13/2009	6.56	-11.5	0.22	2,767	15.77	--	--	<5.0	<0.29	<0.28	7.9	6.1	7,800	3,700	2,800
	11/18/2009	6.56	-94.2	1.34	2,140	18.02	--	--	<5.0	<0.29	<0.28	7.3	4.9	10,000	5,700	3,900
	3/9/2010	6.59	-33.0	0.99	2,125	12.16	--	--	<5.0	<0.29	<0.28	5.9	5	9,200	5,900	3,500
	5/26/2010	6.69	-74.0	0.88	2,177	14.63	--	--	2.6	<0.21	<0.17	6.1	4.5	7,200	5,200	2,700
	8/31/2010	6.50	-82.7	0.41	1,748	16.34	--	--	3.4	<0.21	<0.17	7.3	5.9	5,500	4,700	2,600
	12/6/2010	6.75	-95.1	1.41	1,454	17.61	--	--	2.7	<0.21	<0.17	7.0	5.4	5,400	4,800	2,900
	3/22/2011	6.71	-14.4	1.26	2,380	16.32	--	--	2	<0.21	<0.17	5.3	5.1	4,700	4,600	2,400
	5/25/2011	6.65	-1.7	0.58	2,527	15.97	--	--	2.2	<0.21	<0.17	6.5	4.6	4,200	4,600	2,500
	9/15/2011	6.66	-59.3	1.33	2,380	16.04	--	--	2.3	<0.10	<0.12	4.4	4.0	3,600	3,500	1,900
	12/22/2011	6.52	55.6	2.27	2,373	17.48	--	--	2.1	<0.14	<0.08	4.3	3.5	3,200	3,500	2,100
	4/4/2012	6.63	-125.6	1.12	2,195	14.42	--	--	1.9	<1.0	<1.0	5.5	3.8	3,000	3,500	1,900
	6/13/2012	6.69	-64.8	0.59	2,075	16.29	--	--	1.6	<1.0	<1.0	5.3	4.0	3,000	3,900	2,000
	8/30/2012	6.94	-34.8	0.70	2,038	16.64	--	--	1.5	<1.0	<1.0	4.9	3.9	1,900	2,800	1,300
	12/19/2012	7.54	116.1	7.36	3	14.24	--	--	2.5	<1.0	<1.0	8.4	3.5	2,000	3,100	1,300
	3/6/2013	6.39	-67.0	1.96	2,285	16.49	--	--	1.5	<1.0	<1.0	5.6	3.0	4,500	2,700	1,500
	5/16/2013	6.65	-217.8	-0.16	3,416	16.88	--	--	3.1	0.91 J	0.41 J	4.3	2.2	3,100	2,100	840
	9/23/2013	6.65	-9.5	5.30	3,536	16.81	--	--	2.7	<1.0	<1.0	7.0	4.3	3,800	2,400	1,200
	12/16/2013	6.47	-50.3	0.73	3,380	16.80	--	--	3.5	<1.0	<1.0	8.6	5.8	5,700	2,900	2,000
	4/2/2014	6.57	-44.8	0.39	5,155	16.62	--	--	3.6	<1.0	<1.0	11	30	4,900	2,900	1,800
	6/11/2014	6.36	-17.5	0.92	4,640	15.20	--	--	4.1	<1.0	<1.0	10	7.6	4,400	3,400	2,100
	8/28/2014	6.58	-115.6	2.67	5,383	16.42	--	--	3.4	<1.0	<1.0	10.4	8.4	4,000	2,100	1,400
	12/8/2014	6.40	-49.8	1.19	4,281	16.06	--	--	4.5	<1.0	<1.0	7.44	6.05	7,400	3,000	2,400
	4/7/2015	6.59	-33.0	0.62	5,720	15.51	--	--	3	<1.0	<1.0	7.6	6.59	5,500	2,600	1,900
	6/30/2015	6.40	2.6	0.59	6,214	15.92	--	--	4.5	<1.0	<1.0	7.5	5.9	3,800	2,400	1,400
	10/5/2015	6.37	-12.8	1.65	6,715	15.96	--	--	2.8	<1.0	<1.0	6.8	6.8	6,600	2,700	2,700
	12/21/2015	6.66	112.2	1.17	6,103	15.54	--	--	3.9	<1.0	<1.0	7.2	6.0	5,800	2,300	2,200
	3/31/2016	6.44	-22.3	5.27	5,575	16.67	--	--	4.2	<1.0	<1.0	9.4	7.5	5,000	2,300	2,100
	7/6/2016	6.60	-35.3	0.40	5,464	15.95	--	--	--	--	--	--	--	--	--	--
	9/28/2016	6.20	23.2	0.65	6,055	12.47	--	--	4.5	<1.0	<1.0	7.6	6.2	4,800	2,300	1,900
	4/10/2017	6.28	-16.9	0.56	5,448	16.93	--	--	3.6	<1.0	<1.0	7.7	5.5	3,600	2,200	1,800
	9/28/2017	6.65	-118.2	2.93	4,900	17.81	--	--	< 10	<1.0	<1.0	9.8	7.0	3,100	4,000	2,400
	12/13/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/29/2018	6.67	-15.9	0.21	5,174	16.14	--	--	2.7	<1.0	<1.0	8.5	6.1	3,400	2,400	2,100
	9/5/2018	6.72	4.1	3.06	4,934	18.32	--	--	2.8	<1.0	<1.0	10.2	7.3	2,200	2,000	1,900
	12/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	8/9/2004	--	--	--	--	--	--	--	--	0.37	0.52	0.34	6.2	--	--	--
MW-15r	11/17/2004	--	--	--	--	--	--	--	--	0	0	1.6	7	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	1.3	<0.3	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	1	2	--	--	--
	8/12/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	1.3	7.3	--	--	--
	10/28/2005	--	--	--	--	--	--	--	--	<0.6	<0.8	1.6	7.7	--	--	--
	2/16/2006	--	--	--	--	--	--	--	--	<0.6	<0.8	<1.4	<0.6	--	--	--
	8/21/2006	--	--	--	--	--	--	--	--	<0.3	<0.3	1.3	5.6	--	--	--

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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-15r	8/28/2007	--	--	--	--	--	--	--	--	<0.4	<0.3	1.2	4	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	0.57	0.75	0.68	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	0.97	2.1	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	0.66 J	2.8	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	<0.12	0.84 J	2.3	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
MW-16	8/9/2004	--	--	--	--	--	--	--	--	0.37	0.52	0.34	0.36	--	--	--
MW-16r	11/17/2004	--	--	--	--	--	--	--	--	0	0	1	0	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	<0.7	<0.3	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	<0.7	<0.3	--	--	--
	8/12/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	<0.7	<0.3	--	--	--
	10/28/2005	--	--	--	--	--	--	--	--	<0.6	0.7 J	1.3 J	1.6	--	--	--
	2/16/2006	--	--	--	--	--	--	--	--	<0.6	<0.8	<1.4	1.1	--	--	--
	8/21/2006	--	--	--	--	--	--	--	--	<0.3	<0.3	<0.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	0.5	0.7	0.6	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	0.52	0.71	0.67	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	0.65	0.84	0.69	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	0.58 J	0.67 J	0.65 J	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	0.42 J	0.58 J	0.70 J	--	--	--
	4/4/2012	--	--	--	--	--	--	--	--	<1.0	0.54 J	0.49 J	0.34 J	--	--	--
	8/31/2012	--	--	--	--	--	--	--	--	<1.0	0.50 J	0.56 J	0.31 J	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	0.79 J	0.53 J	0.35 J	--	--	--
	9/24/2013	--	--	--	--	--	--	--	--	<1.0	0.63 J	0.54 J	0.37 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	1.1	0.43 J	1.1	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	0.60 J	0.43 J	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	0.434 J	<1.0	<1.0	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	0.55 J	0.39 J	<1.0	--	--	--
MW-20	4/8/1997	--	--	--	--	--	--	--	--	<10	8J	4J	<10	--	--	--
	9/3/1999	--	--	--	--	--	--	30.9	5.1	<1.0	1.9	1.8J	<2.0		<5	27
	8/10/2004	--	--	--	--	--	--	--	--	0.37	7	2.9	0.36	--	--	--
MW-20r	11/17/2004	--	--	--	--	--	--	--	--	0	8.3	3.8	0	--	--	--
	2/9/2005	7.01	-22.2	0.19	697	16.67	--	29	<5.0	<0.4	4.2	3.4	<0.3	14,000	540	88
	5/9/2005	7.09	51.8	0.37	631	15.57	--	36	10	<0.4	11	3	<0.3	16,000	1,700	210
	8/10/2005	6.89	-2.5	0.34	770	--	--	--	--	<0.4	5.4	4.2	<0.3	--	--	--
	10/28/2005	--	--	--	--	--	--	--	--	<0.6	2.6	3	<0.6	--	--	--
	2/15/2006	--	--	--	--	--	--	--	--	<0.6	2.6	2.7	<0.6	--	--	--
	8/22/2006	--	--	--	--	--	--	--	--	<0.4	1	2.2	<0.2	--	--	--
	2/12/2007	--	--	--	--	--	--	--	--	<0.3	1.1	2.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	1.1	1.9	<0.2	--	--	--
	3/3/2008	--	--	--	--	--	--	--	--	<0.46	2	3.5	<0.22	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	1.3	2.5	<0.23	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	1.3	1.9	<0.17	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	2	2.7	0.31	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	1.2	2.3	0.32 J	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	1.1	2.8	<0.11	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	1.2	2.2	<0.04	--	--	--
	9/16/2011	--	--	--	--	--	--	--	--	<0.10	1.1	2.4	0.26	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	0.64 J	1.2	2.3	<1.0	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	1.0	3.1	0.39 J	--	--	--
	3/6/2013	--	--	--	--	--	--	--	--	<1.0	1.3	1.6	0.21 J	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Ortho Clinical Diagnostics, Raritan, New Jersey

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-20r	9/24/2013	--	--	--	--	--	--	--	--	<1.0	1.1	1.4	0.17 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	1.5	1.3	0.73 J	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	0.92 J	1.1	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	1.24	1.23	<1.0	--	--	--
	10/5/2015	--	--	--	--	--	--	--	--	<1.0	0.38 J	0.57 J	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	1.1	<1.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	0.41 J	2.6	<1.0	--	--	--
MW-21	8/9/2004	--	--	--	--	--	--	--	--	0.37	15	4.9	0.36	--	--	--
MW-21r	8/11/2005	5.52	-54.1	0.77	2,747	15.81	--	--	--	<0.4	8	11	1.4	2,100	200	380
	3/1/2006	--	--	--	--	--	--	--	--	<0.6	2.5	7.7	1.2	--	--	--
	8/22/2006	--	--	--	--	--	--	--	--	<0.4	2.1	8.2	<0.2	--	--	--
	2/12/2007	--	--	--	--	--	--	--	--	<0.3	1.1	4	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	1.2	7	0.8	--	--	--
	3/4/2008	--	--	--	--	--	--	--	--	<0.46	2.3	4.3	0.7	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	1.1	7.2	0.92	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	1.7	7.5	0.75	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	0.79	6.2	0.72	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	0.89 J	3.6	0.71 J	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	0.59 J	2.9	0.61 J	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	1.4	6	0.66 J	--	--	--
	9/16/2011	--	--	--	--	--	--	--	--	<0.10	0.41	3.2	0.86	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	0.43 J	0.36J	2	0.67 J	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	0.29 J	3.3	1.2	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	2	0.82 J	--	--	--
	9/24/2013	--	--	--	--	--	--	--	--	<1.0	0.77 J	5.8	0.61 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	0.91 J	7.9	4.5	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	1.1	5.7	0.72 J	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	1.35	3.67	0.645 J	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	2.7	1.3	--	--	--
MW-22r	8/12/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	<0.7	<0.3	--	--	--
	8/21/2006	--	--	--	--	--	--	--	--	<0.3	<0.3	<0.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	1.2	0.4	<0.2	<0.2	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	<0.22	0.38	<0.23	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.10	--	--	--
MW-25r	8/12/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	<0.7	<0.3	--	--	--
	8/21/2006	--	--	--	--	--	--	--	--	<0.3	<0.3	<0.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	<0.22	<0.24	<0.23	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.10	--	--	--
MW-26	8/28/2007	--	--	--	--	--	--	--	<5	0.7	<0.3	<0.2	<0.2	--	--	--
	9/3/2008	--	--	--	--	--	--	--	<5.0	0.55	<0.22	<0.24	<0.23	--	--	--
	8/13/2009	--	--	--	--	--	--	--	17	<0.29	<0.28	<0.20	<0.17	--	--	--
	8/31/2010	--	--	--	--	--	--	--	11	0.56 J	<0.17	<0.16	<0.11	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-26	9/15/2011	--	--	--	--	--	--	--	14	0.96 J	<0.12	<0.11	<0.10	--	--	--
	8/30/2012	--	--	--	--	--	--	--	0.16 J	--	--	--	--	--	--	--
	12/19/2012	--	--	--	--	--	--	--	--	2.2	0.35 J	<1.0	<1.0	--	--	--
	9/20/2013	--	--	--	--	--	--	--	7.6	0.62 J	<1.0	<1.0	<1.0	--	--	--
	8/27/2014	--	--	--	--	--	--	--	5.9	1	0.38 J	<1.0	<1.0	--	--	--
	10/1/2015	--	--	--	--	--	--	--	17	0.41 J	<1.0	<1.0	<1.0	--	--	--
MW-27	8/14/1998	--	--	--	--	--	--	--	--	<5	110	2J	2J	--	--	--
	9/2/1999	6.43	418.0	0.24	888	20.80	--	42	1.3	<1.0	120	2.3J	1.4J	--	<5.0	25
	8/10/2004	--	--	--	--	--	--	<20	561	0.37	2.1	15	5.5	16,000	160	1,000
MW-27r	11/17/2004	6.21	-73.0	4.26	1,610	17.78	--	--	110	0	0	4.5	3	19,000	710	2,200
	8/11/2005	5.90	-51.4	0.46	1,351	16.27	--	--	14	<0.4	<0.5	3.5	1.3	5,300	940	420
	10/27/2005	6.03	-114.5	0.17	1,104	15.82	--	--	59	--	--	--	--	--	--	--
	2/15/2006	--	--	--	--	--	--	--	28	--	--	--	--	--	--	--
	5/18/2006	5.38	--	--	--	--	--	--	190	--	--	--	--	--	--	--
	8/22/2006	--	--	--	--	--	--	--	5.8	<0.4	<0.3	9.9	4.5	--	--	--
	11/14/2006	--	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	<0.3	1.7	1.3	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	<0.22	1.5	1.6	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	0.73	0.87	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	1.1	1.2	--	--	--
	9/16/2011	--	--	--	--	--	--	--	--	<0.10	<0.12	32	3.4	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	5.7	4.4	--	--	--
	9/24/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	0.47 J	0.65 J	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	0.87 J	1.1	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	0.41 J	0.41 J	--	--	--
MW-28	8/14/1998	--	--	--	--	--	--	--	--	<5	15	19	4J	--	--	--
	9/3/1999	6.95	383.0	1.79	1,207	18.00	--	20.5	3.6	<1.0	12	17	3.5	--	184	104
	8/10/2004	--	--	--	--	--	--	--	--	0.37	2.6	0.47	2.3	--	--	--
	8/10/04 (DUP)	--	--	--	--	--	--	--	--	0.37	2.3	14	2.3	--	--	--
MW-28r	11/17/2004	--	--	--	--	--	--	--	--	0	2.6	17	3.1	--	--	--
	11/17/04 (DUP)	--	--	--	--	--	--	--	--	0	2.5	17	3	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	2.1	16	1.7	--	--	--
	2/8/05 (DUP)	--	--	--	--	--	--	--	--	<0.4	2.2	15	1.5	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	<0.4	2	14	<0.8	--	--	--
	5/9/05(DUP)	--	--	--	--	--	--	--	--	<0.4	2	14	<0.8	--	--	--
	8/11/2005	6.84	183.7	0.35	1,497	14.05	--	--	5.9	<0.4	2.9	13	1.9	42	170	390
	10/28/2005	--	--	--	--	--	--	--	--	<0.6	3.4	17	2.6	--	--	--
	10/28/05(DUP)	--	--	--	--	--	--	--	--	<0.6	2.9	16	3.3	--	--	--
	2/15/2006	--	--	--	--	--	--	--	<5.0	<0.6	2.7	16	2.1	--	--	--
	8/22/2006	--	--	--	--	--	--	--	--	<0.4	2.4	16	1.6	--	--	--
	8/22/06(DUP)	--	--	--	--	--	--	--	<5.0	<0.4	2.5	12	1.6	--	--	--
	2/12/2007	--	--	--	--	--	--	--	--	<0.3	1.6	10	1.4	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	3.5	10.2	1.2	--	--	--
	8/28/07 (DUP)	--	--	--	--	--	--	--	--	<0.4	3.8	11	1.3	--	--	--
	3/4/2008	--	--	--	--	--	--	--	--	<0.46	5	12	1.2	--	--	--
	3/4/08 (DUP)	--	--	--	--	--	--	--	--	<0.46	5.3	12	1.4	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	4.7	11	1.4	--	--	--
	9/4/08 (DUP)	--	--	--	--	--	--	--	--	<0.26	4.5	11	1.3	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	4.7	14	1.4	--	--	--
	3/5/09 (DUP)	--	--	--	--	--	--	--	--	<0.29	4.6	13	1.7	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-28r	8/12/2009	--	--	--	--	--	--	--	--	<0.29	5.9	13	1.2	--	--	--
	8/12/09 (DUP)	--	--	--	--	--	--	--	--	<0.29	6	13	1.4	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	4.9	10	1.3	--	--	--
	8/31/2010	--	--	--	--	--	--	--	--	<0.21	6.5	12	1.5	--	--	--
	8/31/10 (DUP)	--	--	--	--	--	--	--	--	<0.21	6.5	12	1.6	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	6.9	11	1.3	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	6.4	10	1.3	--	--	--
	9/15/11 (DUP)	--	--	--	--	--	--	--	--	<0.10	6.2	9.8	1.3	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	<1.0	6.2	9.2	0.90 J	--	--	--
	4/3/2012 (DUP)	--	--	--	--	--	--	--	--	<1.0	6	8.7	0.78 J	--	--	--
	8/31/2012	--	--	--	--	--	--	--	--	<1.0	5.1	9.1	1.2	--	--	--
	8/31/2012 (DUP)	--	--	--	--	--	--	--	--	<1.0	4.9	9	1.2	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	6.8	8.9	1.1	--	--	--
	9/23/2013	--	--	--	--	--	--	--	--	<1.0	5.9	6.9	0.93 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	4.7	5.8	3.1	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	4.5	6.2	1.0	--	--	--
	8/28/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	4.6	6.4	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	2.65	4.84	0.638 J	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	5.3	4.5	0.48 J	--	--	--
	10/1/2015 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.4	4.5	0.47 J	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	7.2	5.2	<1.0	--	--	--
	3/30/2016 (DUP)	--	--	--	--	--	--	--	--	<1.0	7.1	5.2	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	4.9	4.6	<1.0	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	3.7	4.0	<1.0	--	--	--
	4/7/2017 (DUP)	--	--	--	--	--	--	--	--	<1.0	3.6	4.0	<1.0	--	--	--
	9/28/2017	--	--	--	--	--	--	--	--	<1.0	5.2	4.9	<1.0	--	--	--
	9/28/2017 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.5	4.9	<1.0	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	<1.0	4.3	3.8	<1.0	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	<1.0	4.9	4.4	<1.0	--	--	--
MW-28D	8/31/1999	--	--	--	--	--	--	18.7	1	1.9	1.2	<5.0	<2.0	--	27	20
	8/10/2004	--	--	--	--	--	--	--	--	2.9	0.52	0.34	0.36	--	--	--
	8/10/2005	7.92	262.5	2.89	487	14.27	--	--	5.1	3.7	<0.5	<0.7	<0.3	--	--	--
	8/10/05(DUP)	--	--	--	--	--	--	--	--	3.6	<0.5	<0.7	<0.3	--	--	--
	8/22/2006	--	--	--	--	--	--	--	<5.0	2.9	<0.3	<0.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	<5	2.8	0.4	<0.2	<0.2	--	--	--
MW-28Dr	9/3/2008	--	--	--	--	--	--	--	<5.0	3.2	0.59	<0.24	<0.23	--	--	--
	9/3/2008 (DUP)	--	--	--	--	--	--	--	--	2.9	0.74	<0.24	<0.23	--	--	--
	8/12/2009	--	--	--	--	--	--	--	<5.0	2.9	0.48	0.23	<0.17	--	--	--
	8/31/2010	--	--	--	--	--	--	--	<1.0	2.9	0.44 J	0.21 J	<0.11	--	--	--
	9/15/2011	--	--	--	--	--	--	--	0.50 J	3	0.41 J	<0.11	<0.10	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	1.5	0.41 J	0.30 J	<1.0	--	--	--
	8/30/2012	--	--	--	--	--	--	--	<1.0	2.4	0.52 J	<2.0	<1.0	--	--	--
	8/30/2012 (DUP)	--	--	--	--	--	--	--	--	2.3	0.45 J	<2.0	<1.0	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	2.7	0.62 J	<2.0	<1.0	--	--	--
	9/23/2013	--	--	--	--	--	--	--	<1.0	2.2	0.47 J	<1.0	<1.0	--	--	--
	4/2/2014	--	--	--	--	--	--	--	<1.0	1.9	0.50 J	<1.0	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	1.2	1.5	0.49 J	<1.0	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	1.44	0.411 J	<1.0	<1.0	--	--	--
	4/8/2015 (DUP)	--	--	--	--	--	--	--	--	1.39	0.418 J	<1.0	<1.0	--	--	--
	10/1/2015	--	--	--	--	--	--	--	2.1	1.5	0.45 J	<1.0	<1.0	--	--	--
	9/27/2016	--	--	--	--	--	--	--	2.7	1.6	0.29 J	<1.0	<1.0	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-28Dr	9/27/2016 (DUP)	--	--	--	--	--	--	--	--	1.6	0.36 J	<1.0	<1.0	--	--	--
	9/28/2017	--	--	--	--	--	--	--	1.6	1.6	0.42 J	<1.0	<1.0	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	1.2	<1.0	<1.0	<1.0	--	--	--
	9/6/2018 (DUP)	--	--	--	--	--	--	--	--	1.3	<1.0	<1.0	<1.0	--	--	--
MW-29r	2/13/2007	--	--	--	--	--	--	--	--	<0.3	1.8	<0.3	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	3	0.3	<0.2	--	--	--
	3/4/2008	--	--	--	--	--	--	--	--	<0.46	4.6	0.57	<0.22	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	4.8	1	<0.23	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	3.1	2.2	<0.17	--	--	--
	8/13/2009	--	--	--	--	--	--	--	--	<0.29	2.9	2.4	<0.17	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	1.5	3	<0.17	--	--	--
	8/31/2010	--	--	--	--	--	--	--	--	<0.21	0.96 J	2.5	<0.11	--	--	--
	5/25/2011	--	--	--	--	--	--	--	--	<0.21	0.92 J	3.2	<0.04	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	1.9	6.3	<0.10	--	--	--
(21.5-23)	4/3/2012	--	--	--	--	--	--	--	--	0.47 J	1.2	4.3	<1.0	--	--	--
(26.5-28)	4/3/2012	--	--	--	--	--	--	--	--	0.30 J	1	3.6	<1.0	--	--	--
	8/31/2012	--	--	--	--	--	--	--	--	<1.0	0.95 J	4.1	<1.0	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	1.5	7.3	<1.9	--	--	--
	9/23/2013	--	--	--	--	--	--	--	--	<1.0	1.2	8.3	0.36 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	0.66 J	4.7	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	0.68 J	5.7	<1.0	--	--	--
	8/28/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	0.68 J	5.3	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	5.63	<1.0	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	0.45 J	5.4	<1.0	--	--	--
MW-29D	8/9/2004	--	--	--	--	--	--	--	--	0.37	44	8.9	1	--	--	--
MW-29Dr	11/17/2004	--	--	--	--	--	--	--	--	0	53	12	1.2	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	55	21	3.3	--	--	--
	5/9/2005	--	--	--	--	--	--	--	5.2	<0.4	64	12	1	--	--	--
	8/10/2005	--	--	--	--	--	--	--	4.8	<0.4	70	12	1.2	--	--	--
	10/27/2005	--	--	--	--	--	--	--	<5.0	<0.6	46	11	0.9	--	--	--
	2/16/2006	--	--	--	--	--	--	--	--	<0.6	45	12	<0.6	--	--	--
	5/18/2006	--	--	--	--	--	--	--	--	<0.6	46	11	0.8	--	--	--
	8/22/2006	--	--	--	--	--	--	--	<5.0	<0.4	39	8.8	<0.2	--	--	--
	11/14/2006	--	--	--	--	--	--	--	--	<0.4	29	9.4	<0.2	--	--	--
	11/14/06(DUP)	--	--	--	--	--	--	--	--	<0.4	29	9.2	<0.2	--	--	--
	2/12/2007	--	--	--	--	--	--	--	--	<0.3	31	9.9	<0.2	--	--	--
	2/12/2007(DUP)	--	--	--	--	--	--	--	--	<0.3	32	10	<0.2	--	--	--
	5/15/2007	--	--	--	--	--	--	--	--	<0.4	35	11	1.1	--	--	--
	5/15/2007 (DUP)	--	--	--	--	--	--	--	--	<0.4	35	11	1.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	<5	<0.4	26	11	1.1	--	--	--
	11/27/2007	--	--	--	--	--	--	--	--	<1	26	11	1.3	--	--	--
	11/27/07 (DUP)	--	--	--	--	--	--	--	--	<1	26	11	1.2	--	--	--
	3/4/2008	--	--	--	--	--	--	--	--	<0.46	27	14	1.6	--	--	--
	5/20/2008	--	--	--	--	--	--	--	--	<0.3	20	13	1	--	--	--
	5/20/2008 (DUP)	--	--	--	--	--	--	--	--	<0.3	20	13	2	--	--	--
	9/3/2008	--	--	--	--	--	--	--	<5.0	<0.26	11	17	1.8	--	--	--
	12/2/2008	--	--	--	--	--	--	--	--	<0.2	7.6	18	1.5	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	10	20	1.7	--	--	--
	5/19/2009	--	--	--	--	--	--	--	--	<0.29	11	16	1.5	--	--	--
	8/12/2009	--	--	--	--	--	--	--	<5.0	<0.29	11	19	2.4	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-29Dr	11/18/2009	--	--	--	--	--	--	--	--	<0.29	10	17	2	--	--	--
	11/18/2009 (DUP)	--	--	--	--	--	--	--	--	<0.29	10	18	2.2	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	8.6	18	2.5	--	--	--
	3/9/2010 (DUP)	--	--	--	--	--	--	--	--	<0.29	9	19	2.6	--	--	--
	5/26/2010	--	--	--	--	--	--	--	--	<0.21	6.4	23	2.5	--	--	--
	5/26/2010 (DUP)	--	--	--	--	--	--	--	--	<0.21	6.3	23	2.4	--	--	--
	8/31/2010	--	--	--	--	--	--	--	<1.0	<0.21	4.7	19	2.7	--	--	--
	12/7/2010	--	--	--	--	--	--	--	--	<0.21	6.2	16	2.2	--	--	--
	12/7/2010 (DUP)	--	--	--	--	--	--	--	--	<0.21	6.1	16	2.2	--	--	--
(61-62.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	0.63 J	<0.11	--	--	--
(66-67.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	0.57 J	<0.11	--	--	--
(71-72.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	0.75 J	<0.11	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	5	15	2.3	--	--	--
	3/22/2011 (DUP)	--	--	--	--	--	--	--	--	<0.21	5	15	2.3	--	--	--
	5/25/2011	--	--	--	--	--	--	--	--	<0.21	4.5	18	2.4	--	--	--
	5/25/2011 (DUP)	--	--	--	--	--	--	--	--	<0.21	4.2	17	2.1	--	--	--
	9/15/2011	--	--	--	--	--	--	--	0.64 J	<0.10	6.5	14	1.8	--	--	--
	12/22/2011	--	--	--	--	--	--	--	--	<0.14	5.1	11	1.7	--	--	--
	12/22/2011 (DUP)	--	--	--	--	--	--	--	--	<0.14	4.8	15	1.8	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	<1.0	2.8	15	1.7	--	--	--
	6/13/2012	--	--	--	--	--	--	--	--	<1.0	3.8	17	2.4	--	--	--
	6/13/2012 (DUP)	--	--	--	--	--	--	--	--	<1.0	3.7	17	2.3	--	--	--
	8/30/2012	--	--	--	--	--	--	--	<1.0	<1.0	4.9	15	1.9	--	--	--
	12/19/2012	--	--	--	--	--	--	--	--	<1.0	4.3	16	1.7	--	--	--
	12/19/2012 (DUP)	--	--	--	--	--	--	--	--	<1.0	4	16	1.8	--	--	--
	3/6/2013	--	--	--	--	--	--	--	--	<1.0	1.8	18	2.6	--	--	--
	5/16/2013	--	--	--	--	--	--	--	--	<1.0	3	14	1.8	--	--	--
	9/23/2013	--	--	--	--	--	--	--	<1.0	<1.0	57	47	3	--	--	--
	12/16/2013	--	--	--	--	--	--	--	--	<1.0	12	44	3.3	--	--	--
	12/16/2013 (DUP)	--	--	--	--	--	--	--	--	<1.0	11	43	3.1	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	5.6	36	10	--	--	--
	4/2/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.8	36	11	--	--	--
	6/11/2014	--	--	--	--	--	--	--	--	<1.0	5.7	32	2.6	--	--	--
	6/11/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.6	33	2.8	--	--	--
	8/28/2014	--	--	--	--	--	--	--	<1.0	<1.0	4.2	28.6	3.4	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	9.13	24.2	2.24	--	--	--
	12/8/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	9.81	26.1	2.35	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	10.1	21	2.88	--	--	--
	4/8/2015 (DUP)	--	--	--	--	--	--	--	--	<1.0	9.17	19.6	2.62	--	--	--
	6/30/2015	--	--	--	--	--	--	--	--	<1.0	1.6	26.6	4	--	--	--
	10/5/2015	--	--	--	--	--	--	--	0.44 J	<1.0	1.5	20	3.1	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	<1.0	4	27.5	4.3	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	9	30	4.5	--	--	--
	7/6/2016	--	--	--	--	--	--	--	--	<1.0	2.5	26.9	5.8	--	--	--
	9/28/2016	--	--	--	--	--	--	--	0.33 J	<1.0	3.2	22.9	3.8	--	--	--
	9/28/2016 (DUP)	--	--	--	--	--	--	--	--	<1.0	3.4	21.6	3	--	--	--
	12/21/2016	--	--	--	--	--	--	--	--	<1.0	4.2	31.1	3.5	--	--	--
	12/21/2016 (DUP)	--	--	--	--	--	--	--	--	<1.0	4.1	29.6	2.8	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	10.8	20.1	2.6	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	<1.0	0.32 J	10.8	11.5	--	--	--
	9/28/2017	--	--	--	--	--	--	--	<1.0	<1.0	2.5	41.5	17.7	--	--	--
	12/13/2017	--	--	--	--	--	--	--	--	<1.0	2.7	25.1	14.4	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-29Dr	12/13/2017 (DUP)	--	--	--	--	--	--	--	--	<1.0	2.7	24.7	14.4	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	11.1	20.3	3.8	--	--	--
	3/29/2018 (DUP)	--	--	--	--	--	--	--	--	<1.0	11.4	19.4	4.1	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	<1.0	6.1	59.2	9.7	--	--	--
	6/20/2018 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.9	61.6	10.1	--	--	--
	9/5/2018	--	--	--	--	--	--	--	0.52 J	<1.0	6.3	55.1	7.5	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	<1.0	6.4	30.0	19.3	--	--	--
MW-32	8/10/2004	--	--	--	--	--	--	--	--	6.4	11	28	29	--	--	--
	11/17/2004	--	--	--	--	--	--	--	--	<1.9	15	22	41	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<1.9	<2.4	7.5	17	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	4	4	10	22	--	--	--
	8/12/2005	--	--	--	--	--	--	--	--	<0.4	12	19	52	--	--	--
	10/28/2005	--	--	--	--	--	--	--	--	1.3	1.7	1.7	1.2	--	--	--
	2/16/2006	--	--	--	--	--	--	--	--	4.7	5.5	8.9	15	--	--	--
	5/18/2006	--	--	--	--	--	--	--	--	<0.6	<0.8	<1.4	<0.6	--	--	--
	8/21/2006	--	--	--	--	--	--	--	--	2.1	6.9	14	33	--	--	--
	11/14/2006	--	--	--	--	--	--	--	--	2.1	3.6	4.3	6.7	--	--	--
	2/12/2007	--	--	--	--	--	--	--	--	2.4	10	13	20	--	--	--
	5/15/2007	--	--	--	--	--	--	--	--	4.1	3.6	7.6	13	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	8.8	17	25	--	--	--
	11/27/2007	--	--	--	--	--	--	--	--	1 J	4.8	5.7	12	--	--	--
	3/4/2008	--	--	--	--	--	--	--	--	3.3	4.6	7.3	11	--	--	--
	5/20/2008	--	--	--	--	--	--	--	--	--	2	8	10	15	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	8	13	26	--	--	--
	12/2/2008	--	--	--	--	--	--	--	--	0.2	4.6	5.2	10	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	1.1	8.0	11	20	--	--	--
	5/19/2009	--	--	--	--	--	--	--	--	1.9	3.8	2.5	3.1	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	0.55	6.8	8.7	15	--	--	--
	11/18/2009	--	--	--	--	--	--	--	--	1.5	5.6	5.2	8.4	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	2	2.3	1.6	0.75 J	--	--	--
	5/26/2010	--	--	--	--	--	--	--	--	1.3	6.3	7.7	16	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	4.5	8.6	19	--	--	--
	8/30/2010 (diluted)	--	--	--	--	--	--	--	--	<1.1	4.8 DJ	7.8 D	17 D	--	--	--
	12/7/2010	--	--	--	--	--	--	--	--	0.39 J	1.6	1.6	2.7	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	2.6	1.6	1.5	2.3	--	--	--
	5/25/2011	--	--	--	--	--	--	--	--	2	3.7	6.1	9.3	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	3.2	1.5	<0.11	<0.10	--	--	--
	12/22/2011	--	--	--	--	--	--	--	--	1.4	3.3	2.8	5.2	--	--	--
	4/4/2012	--	--	--	--	--	--	--	--	0.84 J	6	8.1	14	--	--	--
	6/13/2012 (dil.)	--	--	--	--	--	--	--	--	<5.0	8.1 D	11 D	23 D	--	--	--
	8/31/2012 (dil.)	--	--	--	--	--	--	--	--	<2.0	6.6 D	10 D	27 D	--	--	--
	12/19/2012 (dil.)	--	--	--	--	--	--	--	--	<1.0	3.9	4.2	5.9	--	--	--
	3/6/2013 (dil.)	--	--	--	--	--	--	--	--	0.56 J	4.6	6.6	10	--	--	--
	5/16/2013 (DUP, dil.)	--	--	--	--	--	--	--	--	0.52 J	4.5	7.3	11	--	--	--
	5/16/2013 (dil.)	--	--	--	--	--	--	--	--	0.52 J	4.6	7.3	11	--	--	--
	9/24/2013 (dil.)	--	--	--	--	--	--	--	--	<2.0	5.5	8.6	17	--	--	--
	12/16/2013	--	--	--	--	--	--	--	--	<2.0	3.9	5.8	14	--	--	--
	4/2/2014 (dil.)	--	--	--	--	--	--	--	--	<2.0	2.4	3.0	20	--	--	--
	6/11/2014 (dil.)	--	--	--	--	--	--	--	--	<2.0	4.5	4.8	13	--	--	--
	8/28/2014 (dil.)	--	--	--	--	--	--	--	--	<2.0	4.5	7.3	13	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	0.775 J	2.88	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-32	4/8/2014	--	--	--	--	--	--	--	--	0.874 J	2.16	3.09	6.86	--	--	--
	6/29/2015	--	--	--	--	--	--	--	--	0.75 J	5	5.3	10.8	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	2	14.1	23.4	31.6	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	0.98 J	8.5	11	20.5	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	1.8	4.1	5	10	--	--	--
	7/6/2016	--	--	--	--	--	--	--	--	0.67 J	6	7.3	15	--	--	--
	9/27/2016	--	--	--	--	--	--	--	--	0.25 J	5.8	7.5	14.4	--	--	--
	12/21/2016	--	--	--	--	--	--	--	--	0.31 J	3.2	4	8.8	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	1.6	0.43 J	<1.0	<1.0	--	--	--
	4/7/2017 (DUP)	--	--	--	--	--	--	--	--	1.5	0.46 J	<1.0	<1.0	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	1.6	5.7	7.1	11.2	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	1.5	2.4	5.5	--	--	--
	12/13/2017	--	--	--	--	--	--	--	--	<1.0	2.3	3.6	7.8	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	0.97 J	1.3	1.4	<1.0	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	1.4	3.6	4.3	5.1	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	<1.0	1.9	2.7	6.1	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	2.1	<1.0	<1.0	<1.0	--	--	--
MW-32D																
(43-44.5)	12/30/2015	--	--	--	--	--	--	--	--	<1.0	0.24 J	0.29 J	<1.0	--	--	--
(49-50.5)	12/30/2015	--	--	--	--	--	--	--	--	<1.0	0.23 J	0.34 J	<1.0	--	--	--
(55-56.5)	12/30/2015	--	--	--	--	--	--	--	--	<1.0	0.23 J	0.40 J	<1.0	--	--	--
(61-62.5)	12/30/2015	--	--	--	--	--	--	--	--	<1.0	0.28 J	0.47 J	<1.0	--	--	--
	7/6/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
MW-34*	8/31/1999	--	--	--	--	--	--	27.9	1.3	<5.0	560	10J	<10	--	<5	<5
	1/13/2004	7.66	24.3	4.11	878	14.15	--	--	<5	<1.9	230	7.3	<1.8	89	28	42
	5/6/2004	--	--	--	--	--	--	--	<5	<1	230	6.5	<1	19	1,100	1,400
	8/10/2004	--	--	--	--	--	--	3.1	<5.0	1.9	200	32	1.8	320	76	88
	11/17/2004	5.11	-31.0	2.09	1,910	17.96	--	--	130	<1.9	170	47	<1.6	1,700	95	2,100
	2/9/2005	6.26	-10.9	0.43	917	15.95	--	24	<5.0	<1.9	120	35	<1.6	12,000	2,700	930
	5/9/2005	6.28	-80.5	0.44	826	13.93	--	18	33	<2	6	120	<2	24,000	4,700	1,300
	8/11/2005	6.32	11.8	0.43	875	15.32	--	--	6.6	<0.4	64	100	4.3	7,100	1,800	390
	10/27/2005	5.63	-117.7	0.16	1,090	15.42	--	--	6.6	<0.6	1.8	71	11	21,000	2,100	1,100
	12/6/2005	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--
	2/15/2006	6.12	-3.6	0.29	1,485	16.06	--	--	40	<0.6	1.9	35	8.8	22,000	2,100	1,200
	5/18/2006	5.26	--	--	--	--	--	--	33	<0.6	1.4	34	14	--	--	--
	8/22/2006	6.22	-126.5	0.26	822	15.96	--	--	<5.0	<0.4	15	140	19	14,000	2,800	4,000
	11/14/2006	6.31	-50.8	0.20	835	17.84	--	--	<5.0	<0.4	2.5	120	11	18,000	1,800	560
	2/13/2007	6.28	-68.6	0.44	836	16.22	--	--	<5.0	<0.3	3.3	120	11	20,000	3,000	800
	5/15/2007	--	--	--	--	--	--	--	--	<0.4	2.7	130	15	--	--	--
	8/29/2007	6.37	114.5	0.77	1,410	16.98	--	--	<5	<0.4	1.2	100	15	17,000	2,400	1,000
	11/27/2007	--	--	--	--	--	--	--	--	<1	1.4	100	20	20,000	2,900	1,300
	3/3/2008	6.96	-89.6	0.70	1,339	16.08	--	--	--	<0.46	1.6	87	25	--	--	--
	5/20/2008	6.66	78.5	0.48	1,242	14.77	--	--	<5.0	<0.3	2	86	25	12,000	3,500	2,200
	9/3/2008	6.56	14.5	1.62	1,148	14.50	--	--	<5.0	<0.26	0.7	80	32	16,000	4,600	3,400
	12/2/2008	6.92	-138.5	0.38	1,215	16.08	--	--	<5.0	<0.2	0.60	60	34	13,000	4,500	5,700
	3/5/2009	6.97	47.0	0.55	1,216	16.24	--	--	<5.0	<0.29	1.8	100	43	13,000	4,900	6,000
	5/19/2009	6.77	94.2	0.81	1,652	14.87	--	--	<5.0	<0.29	0.65	78	32	9,500	3,800	3,600
	8/13/2009	6.28	-34.7	0.52	1,648	15.71	--	--	<5.0	<0.29	<0.28	13	16	16,000	1,100	2,600

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH	ORP	Dissolved Oxygen	Conductivity	Temperature	Chloride	Sulfate	TOC	PCE	TCE	cis-1,2-DCE	VC	Methane	Ethane	Ethene
		(S.U.)	(mV)	(mg/L)	(µmhos/cm)	(°C)	(mg/L)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ng/L)	(ng/L)
MW-34*	11/18/2009	6.69	-95.8	0.73	1,426	18.18	--	--	<5.0	<0.29	<0.28	13	29	21,000	3,800	15,000
	3/9/2010	6.66	-67.8	0.87	1,869	12.83	--	--	<5.0	<0.29	<0.28	7	20	17,000	4,200	16,000
	5/26/2010	6.77	-34.8	1.18	1,703	14.85	--	--	<2.0	<0.21	0.20 J	11	23	14,000	3,700	16,000
	8/31/2010	6.56	46.5	0.44	1,526	16.04	--	--	3.2	<0.21	<0.17	16	28	12,000	3,800	13,000
	12/6/2010	6.76	-114.9	0.76	1,338	17.63	--	--	1.5	<0.21	<0.17	23	33	13,000	4,200	13,000
	3/22/2011	6.47	102.9	7.10	1,646	15.72	--	--	1.6	<0.21	<0.17	16	31	6,200	2,700	14,000
	5/25/2011	6.78	13.9	0.28	1,855	16.16	--	--	1.7	<0.21	<0.17	24	31	6,300	3,200	13,000
	9/15/2011	6.86	-59.9	2.11	1,556	17.60	--	--	3.6	<0.10	<0.12	23	41	4,200	2,000	14,000
	12/22/2011	6.61	191.3	1.52	1,426	17.94	--	--	1.7	<0.14	<0.08	17	34	3,100	1,700	13,000
	4/4/2012	6.67	-120.8	0.84	1,504	14.37	--	--	1.0	<1.0	<1.0	29	29	2,400	1,400	9,300
	4/4/2012 (DUP)	6.67	-120.8	0.84	1,504	14.37	--	--	--	<1.0	<1.0	29	30	--	--	--
	6/13/2012	6.71	-45.9	0.44	1,431	16.22	--	--	1.4	<1.0	<1.0	41	40	1,300	1,400	8,700
	8/30/2012	7.02	7.1	1.93	1,341	18.68	--	--	0.64 J	<1.0	<1.0	47	46	1,800	1,600	8,100
	12/19/2012	6.82	7.9	0.46	1,295	17.00	--	--	2	<1.0	<1.0	57	41	1,200	1,400	6,800
	3/6/2013	5.67	-106.9	3.35	1,425	16.54	--	--	29	<1.0	<1.0	2	4.9	20,000	2,500	3,700
	5/16/2013	6.43	-260.4	0.24	1,619	16.33	--	--	2	<1.0	0.26 J	4.2	8.5	19,000	2,800	14,000
	9/23/2013	6.90	-51.7	19.60	1,430	16.36	--	--	2	<1.0	<1.0	6.7	19	12,000	2,600	18,000
	12/16/2013	6.08	-50.8	0.45	1,450	15.64	--	--	2.2	<1.0	<1.0	1.1	<1.0	24,000	5,600	3,400
	4/2/2014	6.84	-220.2	0.91	1,799	16.33	--	--	3	<1.0	<1.0	5.5	37	19,000	5,300	8,000
	6/11/2014	6.59	-41.2	0.81	1,728	15.09	--	--	2.9	<1.0	<1.0	15	19	13,000	4,300	12,000
	8/28/2014	6.61	-80.1	2.28	1,926	16.83	--	--	5.4	<1.0	0.79 J	34	27.2	11,000	1,600	4,400
	12/8/2014	6.27	-61.3	0.68	2,123	16.64	--	--	3.8	<1.0	< 1.0	4.89	8.15	7,600	1,500	11,000
	4/7/2015	6.60	-39.5	1.93	4,230	14.19	--	--	1.9	<1.0	< 1.0	8.74	14.9	5,200	1,600	9,000
	6/30/2015	6.34	-2.2	0.47	3,263	15.33	--	--	4.0	<1.0	0.27 J	18	20.4	3,500	1,000	7,500
	10/5/2015	6.20	-30.8	10.37	2,173	15.82	--	--	2.0	<1.0	<1.0	2.5	9.4	19,000	3,200	7,100
	12/21/2015	6.53	70.1	0.21	1,604	16.25	--	--	1.1	<1.0	<1.0	12.7	15.8	17,000	1,600	4,700
	3/31/2016	6.87	-65.6	0.82	2,015	16.33	--	--	1.8	<1.0	<1.0	12.2	21.9	12,000	2,300	9,400
	7/7/2016	6.64	-156.0	0.20	1,517	16.11	--	--	19	<1.0	<1.0	0.64 J	1.4	20,000	3,900	660
	9/28/2016	6.21	14.9	0.59	2,158	12.46	--	--	1.5	<1.0	<1.0	7.6	16.7	13,000	1,900	5,700
	12/21/2016	6.94	-120.5	0.7	1,844	18.30	--	--	1.9	<1.0	<1.0	6.9	16.9	13,000	2,600	14,000
	4/10/2017	6.54	-57.9	0.31	2,412	16.67	--	--	2.2	<1.0	<1.0	7.9	12.6	9,000	1,800	9,500
	7/6/2017	6.40	-4.9	0.07	1,938	16.73	--	--	2.3	<1.0	<1.0	6.8	10.3	17,000	850	1,600
	9/28/2017	6.46	-166.2	3.14	1,942	17.93	--	--	<10	<1.0	<1.0	11.7	20.6	14,000	900	7,300
	12/14/2017	5.35	62.5	0.89	2,304	18.29	--	--	760	<1.0	0.32 J	1.7	1.8	12,000	270	720
	3/29/2018	6.64	-67.9	0.30	1,967	15.68	--	--	2.0	<1.0	<1.0	1.2	2.9	20,000	4,600	4,700
	6/20/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/5/2018	6.91	-70.0	0.64	1,908	18.16	--	--	1.6	<1.0	<1.0	8.9	12.6	11,000	2,200	11,000
	12/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-34D	8/31/1999	7.30	331.0	5.48	912	18.60	--	15.5	1.3	2.9	0.8J	<5.0	<2.0	--	27	54
	8/10/2004	--	--	--	--	--	--	--	--	0.37	4	5.3	1.4	--	--	--
	11/17/2004	--	--	--	--	--	--	--	--	0	1	1.8	0	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	1.3	2	<0.3	--	--	--
	5/9/2005	--	--	--	--	--	--	--	6	<0.4	1	2	<0.3	--	--	--
	8/10/2005	--	--	--	--	--	--	--	4.3	<0.4	2.9	4.1	1.1	--	--	--
	10/27/2005	--	--	--	--	--	--	--	<5.0	<0.6	1.4	2.5	<0.6	--	--	--
	2/15/2006	--	--	--	--	--	--	--	--	<0.6	1.4	2.4	<0.6	--	--	--
	8/22/2006	--	--	--	--	--	--	--	<5.0	<0.4	2.1	3.7	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	<5	<0.4	1.1	10	2	--	--	--
	9/3/2008	--	--	--	--	--	--	--	<5.0	<0.26	1	9.1	2.9	--	--	--
	8/13/2009	--	--	--	--	--	--	--	<5.0	<0.29	1.4	11	3.7	--	--	--
	8/13/09 (DUP)	--	--	--	--	--	--	--	--	<0.29	1.2	11	3.5	--	--	--

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		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-34D	8/31/2010	--	--	--	--	--	--	--	1.2	<0.21	1.6	11	3.5	--	--	--
	9/15/2011	--	--	--	--	--	--	--	0.88 J	<0.10	1.9	11	3.2	--	--	--
(66-67.5)	4/4/2012	--	--	--	--	--	--	--	--	<1.0	2.4	11	2.6	--	--	--
(70-71.5)	4/4/2012	--	--	--	--	--	--	--	--	0.21 J	1.9	9.3	2.1	--	--	--
	8/30/2012	--	--	--	--	--	--	--	0.96 J	--	--	--	--	--	--	--
	12/19/2012	--	--	--	--	--	--	--	--	<1.0	2.7	14	3.1	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	3.1	14	3.4	--	--	--
	9/23/2013	--	--	--	--	--	--	--	1.5	<1.0	3.6	16	3.7	--	--	--
	4/2/2014	--	--	--	--	--	--	--	1.5	<1.0	3	15	14	--	--	--
	8/28/2014	--	--	--	--	--	--	--	1.6	<1.0	2.3	15.1	4.6	--	--	--
	10/5/2015	--	--	--	--	--	--	--	4.2	<1.0	1.4	10.8	5.1	--	--	--
	9/28/2016	--	--	--	--	--	--	--	4.0	<1.0	3.6	10.5	3.9	--	--	--
	9/28/2017	--	--	--	--	--	--	--	<10	<1.0	1.9	15.5	4.9	--	--	--
	9/5/2018	--	--	--	--	--	--	--	2.7	<1.0	3.8	16.9	4.9	--	--	--
	9/5/2018 (DUP)	--	--	--	--	--	--	--	--	<1.0	3.8	16.8	5.0	--	--	--
MW-35	9/3/1999	--	--	--	--	--	--	27.3	1.1	<50	150	<250	<100		<5	599
	8/10/2004	--	--	--	--	--	--	--	--	0.37	4.6	11	5.5	--	--	--
	11/17/2004	--	--	--	--	--	--	--	--	0	4.3	26	8.6	--	--	--
	2/8/2005	--	--	--	--	--	--	--	--	<0.4	6.1	16	8	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	<0.4	5	11	7	--	--	--
	8/11/2005	6.65	-34.8	0.62	950	16.51	--	--	8.2	<0.4	6	21	9.5	2,800	3,600	2,100
	10/27/2005	--	--	--	--	--	--	--	<5.0	<0.6	6	9.9	6.2	--	--	--
	12/6/2005	--	--	--	--	--	--	--	2.5	--	--	--	--	--	--	--
	2/15/2006	--	--	--	--	--	--	--	5.3	<0.6	2.9	8.1	5.2	--	--	--
	5/18/2006	6.45	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--
	8/22/2006	--	--	--	--	--	--	--	<5.0	<0.4	1.8	23	7.5	--	--	--
	2/13/2007	--	--	--	--	--	--	--	--	<0.3	1.5	9.9	3.9	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	0.6	7	4.4	--	--	--
	3/3/2008	--	--	--	--	--	--	--	--	<0.46	0.5	13	5.1	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	<0.22	9.1	4.7	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	0.30	19	6.6	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	11	4.3	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	<0.28	9	4.4	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	12	4.4	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	<0.17	12	4.8	--	--	--
	9/16/2011	--	--	--	--	--	--	--	--	<0.10	<0.12	13	4.6	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	<1.0	0.20 J	12	3.0	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	14	4.2	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	12	3.0	--	--	--
	9/24/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	12	3.5	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	12	16	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	8.7	3.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	10.2	4.0	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	0.56 J	10.1	2.6	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	5.4	2.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	8.2	2.6	--	--	--
MW-36*	9/3/1999	--	--	--	--	--	--	36.6	1.4	<500	44,000	<2500	<1000		<5	199
	1/13/2004	7.04	-3.7	0.96	816	12.15	--	--	<5	<74	28,000	1,400	550	13,000	56,000	260,000
	5/6/2004	--	--	--	--	--	--	--	<5	<74	13,000	3,200	490	18,000	78,000	200,000
	8/10/2004	--	--	--	--	--	--	28.6	23.3	74	13,000	1,900	350	16,000	54,000	120,000

Table 4-1
Full Scale ERD Monitoring Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-36*	11/17/2004	6.78	6.0	2.41	1,040	18.10	--	--	<5	<76	12,000	4,000	230	21,000	97,000	120,000
	2/9/2005	6.19	21.8	0.37	1,271	19.29	--	27	80	<76	8,300	9,300	370	12,000	84,000	60,000
	5/9/2005	6.20	63.9	0.31	1,069	18.33	--	35	27	<76	12,000	13,000	440	19,000	190,000	110,000
	8/11/2005	5.99	177.3	0.58	1,049	19.12	180	--	7	<38	19,000	4,100	360	7,800	82,000	40,000
	10/27/2005	6.22	71.1	0.40	1,085	19.67	29	--	<5.0	<110	23,000	4,000	370	22,000	170,000	97,000
	12/6/2005	--	--	--	--	--	--	--	1.3	--	--	--	--	--	--	--
	2/15/2006	6.32	126.8	0.31	1,370	19.66	180	--	<5.0	<110	22000	3700	310	22,000	170,000	68,000
	5/18/2006	6.29	--	--	--	--	230	--	24	<110	21000	5000	300	14,000	160,000	92,000
	8/22/2006	6.11	19.3	0.44	1,006	19.41	190	--	<5.0	<38	18000	930	330	18,000	160,000	120,000
	11/14/2006	6.48	4.7	0.62	986	19.56	180	--	<5.0	<38	17000	6600	460	19,000	170,000	140,000
	2/13/2007	6.26	-12.8	0.54	1,063	18.94	240	--	5.2	<29	15000	11000	580	23,000	240,000	160,000
	5/15/2007	--	--	--	--	--	--	--	--	<38	9000	21000	570	--	--	--
	8/29/2007	5.98	114.5	1.28	1,257	22.85	230	--	<5	<92	680	16000	630	27,000	330,000	180,000
	11/27/2007	--	--	--	--	--	--	--	6	<200	460	19000	1700	24,000	260,000	280,000
	3/4/2008	6.66	-88.7	2.31	3,309	16.32	--	--	--	<0.46	120	8400	1200	--	--	--
	5/20/2008	6.22	-38.2	0.51	2,575	17.42	960	--	39	<3	8	730	830	16,000	350,000	1,300,000
	9/3/2008	6.51	-97.8	1.76	1,049	20.30	190	--	<5.0	<2.6	46	20000	2900	22,000	260,000	320,000
	12/2/2008	6.50	-118.7	0.62	1,101	19.67	240	--	<5.0	<34	<30	17000	1600	21,000	270,000	190,000
	3/5/2009	6.51	-70.8	1.04	2,246	17.51	670	--	14	<29	<28	13000	2200	24,000	390,000	640,000
	5/19/2009	6.56	-17.5	1.68	1,522	17.06	450	--	5.1	<29	120	12000	3300	20,000	300,000	300,000
	8/13/2009	6.44	-43.9	0.44	1,362	19.84	320	--	<5.0	<29	<28	4800	2400	20,000	330,000	640,000
	11/18/2009	6.57	-55.1	0.99	1,553	21.09	370	--	<5.0	<14	17	3000	1100	26,000	350,000	370,000
	3/9/2010	6.42	19.6	1.18	5,128	14.07	240	--	<5.0	<1.4	6	150	210	28,000	400,000	350,000
	5/26/2010	6.61	67.1	1.66	1,446	17.73	210	--	<2.0	<0.21	4.3	150	120	17,000	180,000	66,000
	8/31/2010	6.47	-105.8	0.54	1,223	18.94	320	--	3.2	<0.21	4.1	33	35	3,100	46,000	31,000
	12/6/2010	6.55	-122.6	0.73	1,114	18.84	270	--	3	<0.21	1.5	37	52	2,600	41,000	40,000
	3/22/2011	6.76	-32.4	1.15	1,957	16.38	840	--	1.9	<0.21	2.5	46	53	1,400	21,000	24,000
	5/25/2011	6.49	8.3	0.11	2,406	18.15	75	--	<1.0	<0.21	6.1	96	46	990	17,000	12,000
	9/15/2011	6.52	-53.5	0.18	1,919	18.84	150	--	1.4	<0.10	16	580 E	97	5,700	58,000	8,300
	9/15/2011 (dil.)	6.52	-53.5	0.18	1,919	18.84	150	--	1.4	<1.0	15 D	550 D	84 D	5,700	58,000	8,300
	12/22/2011	6.37	48.0	1.02	1,570	19.13	410	--	1.3	<1.4	4,600 E	1200	110	5,500	68,000	22,000
	12/22/2011 (dil.)	6.37	48.0	1.02	1,570	19.13	410	--	1.3	--	4,600 D	--	--	5,500	68,000	22,000
(21-22.5)	4/4/2012 (dil.)	6.54	-48.9	1.10	2,179	14.37	420	--	1.0	<100	1200	2100	66 J	4,600	50,000	14,000
(25-26.5)	4/4/2012 (dil.)	6.54	-48.9	1.10	2,179	14.37	420	--	1.0	<100	600	2800	89 J	4,600	50,000	14,000
(21-22.5)	6/13/2012 (dil.)	6.61	-4.3	0.54	1,577	18.55	530	--	2.0	<50	4500 D	1700	<130	8,100	110,000	28,000
(25-26.5)	6/13/2012 (dil.)	6.61	-4.3	0.54	1,577	18.55	530	--	2.0	<50	4800 D	2500 D	160 D	8,100	110,000	28,000
(21-22.5)	8/30/2012 (dil.)	6.96	14.1	0.67	1,417	19.66	270	--	1.7	<50	9100 D	1700 D	170 D	5,700	88,000	26,000
(25-26.5)	8/30/2012 (dil.)	6.96	14.1	0.67	1,417	19.66	270	--	1.7	<50	6000 D	2300 D	160 D	5,700	88,000	26,000
(21-22.5)	12/19/2012 (dil.)	6.69	30.9	0.71	1,178	18.59	390	--	1.7	<50	8700	1,300	120	6,200	96,000	25,000
(25-26.5)	12/19/2012 (dil.)	6.69	30.9	0.71	1,178	18.59	390	--	1.7	<50	8500	1,700	150	6,200	96,000	25,000
(21-22.5)	3/6/2013 (dil.)	6.08	-135.8	1.44	2,011	17.60	1200	--	4.4	<50	98	5,000	990	16,000	340,000	600,000
(25-26.5)	3/6/2013 (dil.)	6.08	-135.8	1.44	2,011	17.60	1200	--	5.4	<50	32 J	2,700	2,200	16,000	340,000	600,000
(21-22.5)	5/16/2013 (dil.)	6.47	-158.9	0.37	1,515	18.71	320	--	1.6	<50	88	7,800	460	20,000	220,000	260,000
(25-26.5)	5/16/2013 (dil.)	6.47	-158.9	0.37	1,515	18.71	320	--	1.6	<50	68	8,300	560	20,000	220,000	260,000
(21-22.5)	9/23/2013 (dil.)	6.44	-55.8	0.34	1,353	19.70	290	--	1.9	<50	18 J	7,500	1,300	20,000	280,000	750,000
(25-26.5)	9/23/2013 (dil.)	6.44	-55.8	0.34	1,353	19.70	290	--	1.9	<50	<50	9,600	3,900	20,000	280,000	750,000
(21-22.5)	12/16/2013 (dil.)	6.33	-55.0	0.24	1,540	19.03	370	--	5.0	<50	<50	3,500	1,700	26,000	1,400,000	1,400,000
(25-26.5)	12/16/2013 (dil.)	6.33	-55.0	0.24	1,540	19.03	370	--	5.0	<50	<50	150	430	26,000	1,400,000	1,400,000
(21-22.5)	4/2/2014 (dil.)	6.48	-97.5	0.44	2,690	16.37	710	--	3.7	<20	46	1,800	3,900	22,000	340,000	140,000
(25-26.5)	4/2/2014 (dil.)	6.48	-97.5	0.44	2,690	16.37	--	--	--	<20	<20	520	3,100	21,000	940,000	230,000
(21-22.5)	6/11/2014 (dil.)	6.19	-12.5	0.64	2,211	17.55	590	--	5.5	<20	38	720	480	19,000	320,000	220,000
(25-26.5)	6/11/2014 (dil.)	6.19	-12.5	0.64	2,211	17.55	--	--	--	<20	27	700	490	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-36* (21-22.5)	8/28/2014	6.37	-140.1	1.65	2,257	19.20	450	--	49.0	<1.0	34.9	34.8	148	21,000	740,000	9,200
(25-26.5)	8/28/2014	6.37	-140.1	1.65	2,257	19.20	--	--	--	<1.0	0.5 J	3.7	3.1	--	--	--
(21-22.5)	12/8/2014 (dil.)	6.15	-33.1	0.55	1,480	18.95	300	--	5.1	<10.0	62.8	1,580	378	20,000	230,000	59,000
(25-26.5)	12/8/2014 (dil.)	6.15	-33.1	0.55	1,480	18.95	--	--	--	<2.0	0.994 J	268	177	--	--	--
(21-22.5)	4/7/2015 (dil.)	6.60	-39.5	0.20	2,790	16.28	720	--	3.9	<10.0	50.6	1,700	765	22,000	240,000	170,000
(25-26.5)	4/7/2015 (dil.)	6.60	-39.5	0.20	2,790	16.28	--	--	--	<10.0	44.8	1620	747	--	--	--
(21-22.5)	6/30/2015 (dil.)	6.17	40.1	1.11	2,187	18.04	480	--	6.8	<10.0	247	2,830	403	18,000	110,000	59,000
(25-26.5)	6/30/2015 (dil.)	6.17	40.1	1.11	2,187	18.04	--	--	--	<10.0	203	2570	373	--	--	--
(21-22.5)	10/5/2015 (dil.)	6.06	-16.2	0.55	1,878	19.18	370	--	14.0	<1.0	36	880	943	15,000	59,000	130,000
(25-26.5)	10/5/2015 (dil.)	6.06	-16.2	0.55	1,878	19.18	--	--	--	<1.0	0.51 J	553	1470	--	--	--
(21-22.5)	12/21/2015 (dil.)	6.38	127.2	0.11	1,582	18.46	340	--	3.6	<1.0	102	5,000	673	16,000	74,000	41,000
(25-26.5)	12/21/2015 (dil.)	6.38	127.2	0.11	1,582	18.46	--	--	--	<1.0	7.1	6,000	1,620	--	--	--
(21-22.5)	3/31/2016 (dil.)	6.29	-32.9	0.66	1,474	18.29	400	--	2.9	<50	126	8,610	729	17,000	140,000	43,000
(21-22.5)	7/7/2016	6.49	-28.3	0.56	1,744	18.40	430	--	3.9	<20	<20	7,720	1,060	21,000	170,000	60,000
(21-22.5)	9/28/2016	6.03	45.2	0.94	1,646	15.41	340	--	2.6	<20	789	5,700	399	16,000	110,000	32,000
(21-22.5)	12/21/2016	6.15	-142.0	6.87	1,606	19.65	230	--	17	<1.0	1.8	2,130	733	15,000	32,000	32,000
(21-22.5)	4/10/2017	6.18	17.5	0.28	1,714	18.34	400	--	3.1	<1.0	177	2,930	554	17,000	94,000	80,000
(21-22.5)	7/6/2017	6.34	12.3	0.12	2,282	19.19	550	--	5.5	<20.0	7.6 J	3,080	1,180	18,000	150,000	150,000
(21-22.5)	9/28/2017	6.58	-31.1	1.94	1,667	20.4	380	--	3.6	<1.0	1,150	8,490	479	14,000	97,000	44,000
(21-22.5)	12/14/2017	6.32	-26.1	1.34	1,703	19.26	380	--	8.3	<25	<25	5,840	2,150	16,000	170,000	130,000
	3/29/2018	6.39	51.2	0.31	1,786	18.06	440	--	2.5	<5.0	647	5,980	984	15,000	110,000	71,000
	6/20/2018	6.05	-97.3	0.31	3,028	19.28	240	--	15	<1.0	2.5	16.8	62.7	15,000	68,000	400,000
	9/5/2018	6.15	-42.7	5.98	1,830	19.74	340	--	2.8	<20	922	7,030	424	11,000	53,000	13,000
	12/5/2018	6.14	91.6	7.85	6	13.59	350	--	11	<5.0	6.8	4,610	1,430	15,000	130,000	180,000
MW-37	8/10/2004	--	--	--	--	--	--	--	--	0.37	0.52	10	3.4	--	--	--
	11/17/2004	--	--	--	--	--	--	--	--	0	0	4.6	2.5	--	--	--
	2/9/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	4.4	2	--	--	--
	5/9/2005	--	--	--	--	--	--	--	--	<0.4	<0.5	2	1	--	--	--
	8/11/2005	7.01	-87.0	0.31	908	17.59	--	--	7.3	<0.4	<0.5	1.4	<0.3	4,600	3,300	1,100
	10/27/2005	--	--	--	--	--	--	--	<5.0	<0.6	<0.8	1 J	0.7	--	--	--
	8/22/2006	--	--	--	--	--	--	--	<5.0	<0.4	<0.3	1.3	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	<5	<0.4	0.5	0.7	<0.2	--	--	--
	9/3/2008	--	--	--	--	--	--	--	<5.0	<0.26	0.93	1	<0.23	--	--	--
	8/12/2009	--	--	--	--	--	--	--	<5.0	<0.29	0.47	1	0.43	--	--	--
	8/31/2010	--	--	--	--	--	--	--	1.5	<0.21	0.61 J	1.1	0.57 J	--	--	--
(61-62.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	0.21	0.89 J	0.48 J	--	--	--
(66-67.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	1.0	1.3	0.54 J	--	--	--
(71-72.5)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	0.48 J	1.1	0.65 J	--	--	--
(76.5-78)	12/7/2010	--	--	--	--	--	--	--	--	<0.21	0.43 J	1.1	0.57 J	--	--	--
	9/15/2011	--	--	--	--	--	--	--	0.79 J	<0.10	0.52 J	2.9	0.83 J	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	<1.0	0.82 J	1.4	0.67 J	--	--	--
	8/30/2012	--	--	--	--	--	--	--	<1.0	<1.0	0.92 J	1.9 J	1.4	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	0.64 J	1.7	0.71 J	--	--	--
	9/20/2013	--	--	--	--	--	--	--	<1.0	<1.0	0.96 J	1.5	0.72 J	--	--	--
	4/2/2014	--	--	--	--	--	--	--	<1.0	<1.0	0.39 J	1.2	2.6	--	--	--
	8/27/2014	--	--	--	--	--	--	--	3.1	<1.0	0.28 J	0.80 J	<1.0	--	--	--
	4/7/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	1.03	0.658 J	--	--	--
	10/1/2015	--	--	--	--	--	--	--	2.2	<1.0	0.47 J	0.67 J	0.29 J	--	--	--
MW-38**	1/14/2004	7.17	54.0	2.31	621	12.71	--	50	--	--	--	--	--	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Ortho Clinical Diagnostics, Raritan, New Jersey

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-36*	11/17/2004	6.78	6.0	2.41	1,040	18.10	--	--	<5	<76	12,000	4,000	230	21,000	97,000	120,000
	2/9/2005	6.19	21.8	0.37	1,271	19.29	--	27	80	<76	8,300	9,300	370	12,000	84,000	60,000
	5/9/2005	6.20	63.9	0.31	1,069	18.33	--	35	27	<76	12,000	13,000	440	19,000	190,000	110,000
	8/11/2005	5.99	177.3	0.58	1,049	19.12	180	--	7	<38	19,000	4,100	360	7,800	82,000	40,000
	10/27/2005	6.22	71.1	0.40	1,085	19.67	29	--	<5.0	<110	23,000	4,000	370	22,000	170,000	97,000
	12/6/2005	--	--	--	--	--	--	--	1.3	--	--	--	--	--	--	--
	2/15/2006	6.32	126.8	0.31	1,370	19.66	180	--	<5.0	<110	22000	3700	310	22,000	170,000	68,000
	5/18/2006	6.29	--	--	--	--	230	--	24	<110	21000	5000	300	14,000	160,000	92,000
	8/22/2006	6.11	19.3	0.44	1,006	19.41	190	--	<5.0	<38	18000	930	330	18,000	160,000	120,000
	11/14/2006	6.48	4.7	0.62	986	19.56	180	--	<5.0	<38	17000	6600	460	19,000	170,000	140,000
	2/13/2007	6.26	-12.8	0.54	1,063	18.94	240	--	5.2	<29	15000	11000	580	23,000	240,000	160,000
	5/15/2007	--	--	--	--	--	--	--	--	<38	9000	21000	570	--	--	--
	8/29/2007	5.98	114.5	1.28	1,257	22.85	230	--	<5	<92	680	16000	630	27,000	330,000	180,000
	11/27/2007	--	--	--	--	--	--	--	6	<200	460	19000	1700	24,000	260,000	280,000
	3/4/2008	6.66	-88.7	2.31	3,309	16.32	--	--	--	<0.46	120	8400	1200	--	--	--
	5/20/2008	6.22	-38.2	0.51	2,575	17.42	960	--	39	<3	8	730	830	16,000	350,000	1,300,000
	9/3/2008	6.51	-97.8	1.76	1,049	20.30	190	--	<5.0	<2.6	46	20000	2900	22,000	260,000	320,000
	12/2/2008	6.50	-118.7	0.62	1,101	19.67	240	--	<5.0	<34	<30	17000	1600	21,000	270,000	190,000
	3/5/2009	6.51	-70.8	1.04	2,246	17.51	670	--	14	<29	<28	13000	2200	24,000	390,000	640,000
	5/19/2009	6.56	-17.5	1.68	1,522	17.06	450	--	5.1	<29	120	12000	3300	20,000	300,000	300,000
	8/13/2009	6.44	-43.9	0.44	1,362	19.84	320	--	<5.0	<29	<28	4800	2400	20,000	330,000	640,000
	11/18/2009	6.57	-55.1	0.99	1,553	21.09	370	--	<5.0	<14	17	3000	1100	26,000	350,000	370,000
	3/9/2010	6.42	19.6	1.18	5,128	14.07	240	--	<5.0	<1.4	6	150	210	28,000	400,000	350,000
	5/26/2010	6.61	67.1	1.66	1,446	17.73	210	--	<2.0	<0.21	4.3	150	120	17,000	180,000	66,000
	8/31/2010	6.47	-105.8	0.54	1,223	18.94	320	--	3.2	<0.21	4.1	33	35	3,100	46,000	31,000
	12/6/2010	6.55	-122.6	0.73	1,114	18.84	270	--	3	<0.21	1.5	37	52	2,600	41,000	40,000
	3/22/2011	6.76	-32.4	1.15	1,957	16.38	840	--	1.9	<0.21	2.5	46	53	1,400	21,000	24,000
	5/25/2011	6.49	8.3	0.11	2,406	18.15	75	--	<1.0	<0.21	6.1	96	46	990	17,000	12,000
	9/15/2011	6.52	-53.5	0.18	1,919	18.84	150	--	1.4	<0.10	16	580 E	97	5,700	58,000	8,300
	9/15/2011 (dil.)	6.52	-53.5	0.18	1,919	18.84	150	--	1.4	<1.0	15 D	550 D	84 D	5,700	58,000	8,300
	12/22/2011	6.37	48.0	1.02	1,570	19.13	410	--	1.3	<1.4	4,600 E	1200	110	5,500	68,000	22,000
	12/22/2011 (dil.)	6.37	48.0	1.02	1,570	19.13	410	--	1.3	--	4,600 D	--	--	5,500	68,000	22,000
(21-22.5)	4/4/2012 (dil.)	6.54	-48.9	1.10	2,179	14.37	420	--	1.0	<100	1200	2100	66 J	4,600	50,000	14,000
(25-26.5)	4/4/2012 (dil.)	6.54	-48.9	1.10	2,179	14.37	420	--	1.0	<100	600	2800	89 J	4,600	50,000	14,000
(21-22.5)	6/13/2012 (dil.)	6.61	-4.3	0.54	1,577	18.55	530	--	2.0	<50	4500 D	1700	<130	8,100	110,000	28,000
(25-26.5)	6/13/2012 (dil.)	6.61	-4.3	0.54	1,577	18.55	530	--	2.0	<50	4800 D	2500 D	160 D	8,100	110,000	28,000
(21-22.5)	8/30/2012 (dil.)	6.96	14.1	0.67	1,417	19.66	270	--	1.7	<50	9100 D	1700 D	170 D	5,700	88,000	26,000
(25-26.5)	8/30/2012 (dil.)	6.96	14.1	0.67	1,417	19.66	270	--	1.7	<50	6000 D	2300 D	160 D	5,700	88,000	26,000
(21-22.5)	12/19/2012 (dil.)	6.69	30.9	0.71	1,178	18.59	390	--	1.7	<50	8700	1,300	120	6,200	96,000	25,000
(25-26.5)	12/19/2012 (dil.)	6.69	30.9	0.71	1,178	18.59	390	--	1.7	<50	8500	1,700	150	6,200	96,000	25,000
(21-22.5)	3/6/2013 (dil.)	6.08	-135.8	1.44	2,011	17.60	1200	--	4.4	<50	98	5,000	990	16,000	340,000	600,000
(25-26.5)	3/6/2013 (dil.)	6.08	-135.8	1.44	2,011	17.60	1200	--	5.4	<50	32 J	2,700	2,200	16,000	340,000	600,000
(21-22.5)	5/16/2013 (dil.)	6.47	-158.9	0.37	1,515	18.71	320	--	1.6	<50	88	7,800	460	20,000	220,000	260,000
(25-26.5)	5/16/2013 (dil.)	6.47	-158.9	0.37	1,515	18.71	320	--	1.6	<50	68	8,300	560	20,000	220,000	260,000
(21-22.5)	9/23/2013 (dil.)	6.44	-55.8	0.34	1,353	19.70	290	--	1.9	<50	18 J	7,500	1,300	20,000	280,000	750,000
(25-26.5)	9/23/2013 (dil.)	6.44	-55.8	0.34	1,353	19.70	290	--	1.9	<50	<50	9,600	3,900	20,000	280,000	750,000
(21-22.5)	12/16/2013 (dil.)	6.33	-55.0	0.24	1,540	19.03	370	--	5.0	<50	<50	3,500	1,700	26,000	1,400,000	1,400,000
(25-26.5)	12/16/2013 (dil.)	6.33	-55.0	0.24	1,540	19.03	370	--	5.0	<50	<50	150	430	26,000	1,400,000	1,400,000
(21-22.5)	4/2/2014 (dil.)	6.48	-97.5	0.44	2,690	16.37	710	--	3.7	<20	46	1,800	3,900	22,000	340,000	140,000
(25-26.5)	4/2/2014 (dil.)	6.48	-97.5	0.44	2,690	16.37	--	--	--	<20	<20	520	3,100	21,000	940,000	230,000
(21-22.5)	6/11/2014 (dil.)	6.19	-12.5	0.64	2,211	17.55	590	--	5.5	<20	38	720	480	19,000	320,000	220,000
(25-26.5)	6/11/2014 (dil.)	6.19	-12.5	0.64	2,211	17.55	--	--	--	<20	27	700	490	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-39*	7/7/2016	7.5	--	--	--	13.39	--	14	--	<1.0	18.9	11.6	<1.0	--	--	--
	7/7/2016 (DUP)	7.5	--	--	--	13.39	--	14	--	<1.0	20.7	11.9	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	21.6	10.8	<1.0	--	--	--
	12/21/2016	7.57	--	--	--	13.52	--	16	--	<1.0	21.4	11.5	<1.0	--	--	--
	4/11/2017	--	--	--	--	--	--	--	--	<1.0	20.2	10.3	<1.0	--	--	--
	7/6/2017	7.39	--	--	--	14.03	--	28	--	<1.0	21.5	10.9	<1.0	--	--	--
	9/28/2017	--	--	--	--	--	--	--	--	<1.0	20.3	11.1	<1.0	--	--	--
	12/14/2017	6.94	--	--	--	13.23	--	30	--	<1.0	19.0	9.8	<1.0	--	--	--
	3/29/2018	7.10	--	--	--	11.72	--	35	--	<1.0	14.3	8.4	<1.0	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	9/5/2018	7.06	--	--	--	14.02	--	35	--	<1.0	14.8	7.2	<1.0	--	--	--
	12/5/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-39D	6/23/2016	--	--	--	--	--	--	--	--	2.5	0.38 J	<1.0	<1.0	--	--	--
(51-52.5)	6/23/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
(56-57.5)	6/23/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
(61-62.5)	6/23/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
(66-67.5)	6/23/2016	--	--	--	--	--	--	--	--	0.24 J	<1.0	<1.0	<1.0	--	--	--
	4/11/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	0.48 J	<1.0	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	1.0	<1.0	--	--	--
	9/28/2017	--	--	--	--	--	--	--	--	<1.0	0.36 J	0.94 J	<1.0	--	--	--
	12/14/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	1.3	<1.0	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	3.9	0.28 J	1.2	<1.0	--	--	--
	1/4/2019	--	--	--	--	--	--	--	--	<1.0	<1.0	1.8	<1.0	--	--	--
MW-40	8/10/2004	--	--	--	--	--	--	--	--	0.37	6.9	4.4	0.36	--	--	--
	8/10/2005	7.48	25.8	0.29	446	12.70	--	--	--	<0.4	18	7.6	<0.3	--	--	--
	2/15/2006	--	--	--	--	--	--	--	--	<0.6	12	7.2	<0.6	--	--	--
	8/22/2006	--	--	--	--	--	--	--	--	<0.4	15	11	<0.2	--	--	--
	2/13/2007	--	--	--	--	--	--	--	--	<0.3	14	8.6	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	15	8.5	<0.2	--	--	--
	3/3/2008	--	--	--	--	--	--	--	--	0.7	21	11	0.4	--	--	--
	9/3/2008	--	--	--	--	--	--	--	--	<0.26	17	9.3	<0.23	--	--	--
	3/5/2009	--	--	--	--	--	--	--	--	<0.29	22	13	<0.17	--	--	--
	8/13/2009	--	--	--	--	--	--	--	--	<0.29	18	11	<0.17	--	--	--
	3/9/2010	--	--	--	--	--	--	--	--	<0.29	18	10	<0.17	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	20	10	<0.11	--	--	--
	3/22/2011	--	--	--	--	--	--	--	--	<0.21	19	11	<0.04	--	--	--
	9/15/2011	--	--	--	--	--	--	--	--	<0.10	20	11	<0.10	--	--	--
	4/4/2012	--	--	--	--	--	--	--	--	<1.0	18	11	<1.0	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	17	10	<1.0	--	--	--
	3/6/2013	--	--	--	--	--	--	--	--	<1.0	20	12	<1.0	--	--	--
	9/23/2013	--	--	--	--	--	--	--	--	<1.0	21	12	<1.0	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	18	9.6	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	15	8.7	<1.0	--	--	--
	4/7/2015	--	--	--	--	--	--	--	--	<1.0	14.2	9.24	<1.0	--	--	--
	9/29/2015	--	--	--	--	--	--	--	--	<1.0	17.2	9	<1.0	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	19.7	10.6	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	21.5	10.1	<1.0	--	--	--
	4/11/2017	--	--	--	--	--	--	--	--	<1.0	21.5	11.5	<1.0	--	--	--
	9/28/2017	--	--	--	--	--	--	--	--	<1.0	23.2	12.3	<1.0	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	12.2	10.1	<1.0	--	--	--
	9/5/2018	--	--	--	--	--	--	--	--	<1.0	19.5	9.6	<1.0	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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Ortho Clinical Diagnostics, Raritan, New Jersey

ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-41D	8/12/2005	--	--	--	--	--	--	--	--	<0.4	3.8	<0.7	<0.3	--	--	--
(52-53.5)	8/12/2005	--	--	--	--	--	--	--	--	<0.4	3.3	<0.7	<0.3	--	--	--
(57-58.5)	8/12/2005	--	--	--	--	--	--	--	--	<0.4	3.2	<0.7	<0.3	--	--	--
(57-58.5 Dup)	8/12/2005	--	--	--	--	--	--	--	--	<0.4	3	<0.7	<0.3	--	--	--
(62-63.5)	8/12/2005	--	--	--	--	--	--	--	--	<0.4	3.2	2.6	<0.3	--	--	--
(67-68.5)	8/21/2006	--	--	--	--	--	--	--	--	<0.3	2.9	<0.2	<0.2	--	--	--
	8/21/06(DUP)	--	--	--	--	--	--	--	--	<0.3	2.6	<0.2	<0.2	--	--	--
	8/28/2007	--	--	--	--	--	--	--	--	<0.4	2.9	<0.2	<0.2	--	--	--
	8/28/07 (DUP)	--	--	--	--	--	--	--	--	<0.4	2.8	<0.2	<0.2	--	--	--
	9/4/2008	--	--	--	--	--	--	--	--	<0.26	3.2	<0.24	<0.23	--	--	--
	8/12/2009	--	--	--	--	--	--	--	--	<0.29	3.3	<0.20	<0.17	--	--	--
	8/30/2010	--	--	--	--	--	--	--	--	<0.21	4.2	<0.16	<0.11	--	--	--
	9/16/2011	--	--	--	--	--	--	--	--	<0.10	4.1	<0.11	<0.10	--	--	--
	9/16/11 (DUP)	--	--	--	--	--	--	--	--	<0.10	3.9	<0.11	<0.10	--	--	--
	4/3/2012	--	--	--	--	--	--	--	--	0.34 J	3.2	<1.0	<1.0	--	--	--
	8/30/2012	--	--	--	--	--	--	--	--	<1.0	3.1	<2.0	<1.0	--	--	--
	3/5/2013	--	--	--	--	--	--	--	--	<1.0	4.1	<1.0	<1.0	--	--	--
	3/5/2013 (DUP)	--	--	--	--	--	--	--	--	<1.0	4.5	<1.0	<1.0	--	--	--
	9/24/2013	--	--	--	--	--	--	--	--	<1.0	4.1	0.24 J	<1.0	--	--	--
	9/24/2013 (DUP)	--	--	--	--	--	--	--	--	<1.0	4.1	0.18 J	<1.0	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	3.9	0.27 J	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	3.5	<1.0	<1.0	--	--	--
	4/7/2015	--	--	--	--	--	--	--	--	<1.0	3.15	<1.0	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	3.8	<1.0	<1.0	--	--	--
	9/5/2018	--	--	--	--	--	--	--	--	<1.0	3.1	<1.0	<1.0	--	--	--
MW-42	9/6/2005	--	--	--	--	--	--	--	--	<0.4	<0.4	<0.4	<0.3	--	--	--
(27.5-29)	11/14/2006	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
(32-33.5)	11/14/2006	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
	5/15/2007	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
	11/27/2007	--	--	--	--	--	--	--	--	<1	<1	<1	<1	--	--	--
	5/20/2008	--	--	--	--	--	--	--	--	<0.3	<0.5	<0.3	<0.2	--	--	--
	12/2/2008	--	--	--	--	--	--	--	--	<0.2	<0.1	<0.2	<0.2	--	--	--
	5/18/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	11/18/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	5/26/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	12/7/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	5/25/2011	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.04	<0.04	--	--	--
	12/22/2011	--	--	--	--	--	--	--	--	<0.14	<0.08	<0.13	<0.29	--	--	--
	6/13/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/19/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	5/16/2013	--	--	--	--	--	--	--	--	<1.0	0.24 J	<1.0	<1.0	--	--	--
	10/8/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/16/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	6/11/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	6/30/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--

Table 4-1
Full Scale ERD Monitoring Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-42	9/29/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/27/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/5/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
MW-43	9/6/2005	--	--	--	--	--	--	--	--	<0.4	<0.4	<0.4	<0.3	--	--	--
(32-33.5)	11/14/2006	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
	5/15/2007	--	--	--	--	--	--	--	--	<0.4	<0.3	<0.2	<0.2	--	--	--
	11/27/2007	--	--	--	--	--	--	--	--	<1	<1	<1	<1	--	--	--
	5/20/2008	--	--	--	--	--	--	--	--	<0.3	<0.5	<0.3	<0.2	--	--	--
	12/2/2008	--	--	--	--	--	--	--	--	<0.2	<0.1	<0.2	<0.2	--	--	--
	5/18/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	11/18/2009	--	--	--	--	--	--	--	--	<0.29	<0.28	<0.20	<0.17	--	--	--
	5/26/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	12/7/2010	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.16	<0.11	--	--	--
	5/25/2011	--	--	--	--	--	--	--	--	<0.21	<0.17	<0.04	<0.04	--	--	--
	12/22/2011	--	--	--	--	--	--	--	--	<0.14	<0.08	<0.13	<0.29	--	--	--
	6/13/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/19/2012	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	5/16/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	10/8/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/16/2013	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/2/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	6/11/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	6/30/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/29/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/27/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	9/5/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
MW-45																
(42.8-44.3)	6/11/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	5.5	2.2	--	--	--
(47.8-49.3)	6/11/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	3	2.1	--	--	--
(57.8-59.3)	6/11/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	1.3	0.97 J	--	--	--
	9/17/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	4.3	3.5	--	--	--
	9/17/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	<1.0	4.5	3.5	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	3.07	4.68	--	--	--
	4/7/2015	--	--	--	--	--	--	--	--	<1.0	0.539 J	3.44	5.6	--	--	--
	7/1/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	1.5	1.4	--	--	--
	7/1/2015 (DUP)	--	--	--	--	--	--	--	--	<1.0	<1.0	1.4	0.89 J	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	3.9	3.2	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-45	12/21/2015	--	--	--	--	--	--	--	--	<1.0	9.7	60.2	41	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	27.3	38.8	--	--	--
	7/6/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	0.75 J	0.94 J	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	106	61.6	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	176	125	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	<1.0	2.4	15.6	20.5	--	--	--
	7/5/2017 (DUP)	--	--	--	--	--	--	--	--	<1.0	2.6	16.6	23.1	--	--	--
	9/28/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	45.6	56.4	--	--	--
	12/14/2017	--	--	--	--	--	--	--	--	<1.0	11.7	10.3	19.3	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	44.5	55.7	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	<1.0	3.2	44.2	29.1	--	--	--
	9/5/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	16.4	21.3	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	<1.0	4.8	16.4	30.2	--	--	--
	12/4/2018 (DUP)	--	--	--	--	--	--	--	--	<1.0	5.9	16.6	27.3	--	--	--
MW-45D																
1	12/30/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	1.8	1.7	--	--	--
2	12/30/2015	--	--	--	--	--	--	--	--	<1.0	6.2	3.9	1.2	--	--	--
3	12/30/2015	--	--	--	--	--	--	--	--	<1.0	1.1	0.66 J	<1.0	--	--	--
4	12/30/2015	--	--	--	--	--	--	--	--	<1.0	1.9	1.7	0.71 J	--	--	--
1	3/31/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	9	8.5	--	--	--
2	3/31/2016	--	--	--	--	--	--	--	--	<1.0	7.5	3.5	0.89 J	--	--	--
3	3/31/2016	--	--	--	--	--	--	--	--	<1.0	0.72 J	0.38 J	<1.0	--	--	--
4	3/31/2016	--	--	--	--	--	--	--	--	0.35 J	3.8	2	0.30 J	--	--	--
1	6/23/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	0.75 J	0.56 J	--	--	--
2	6/23/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	5.8	1.6	--	--	--
3	6/23/2016	--	--	--	--	--	--	--	--	<1.0	1.2	1.1	<1.0	--	--	--
4	6/23/2016	--	--	--	--	--	--	--	--	<1.0	2.9	2.6	<1.0	--	--	--
1	9/22/2016	--	--	--	--	--	--	--	--	<1.0	<1.0	3.8	3.1	--	--	--
2	9/22/2016	--	--	--	--	--	--	--	--	<1.0	7.7	4.5	0.88 J	--	--	--
3	9/22/2016	--	--	--	--	--	--	--	--	<1.0	0.68 J	<1.0	<1.0	--	--	--
4	9/22/2016	--	--	--	--	--	--	--	--	<1.0	3.3	1.8	<1.0	--	--	--
1	3/21/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	3.2	3.1	--	--	--
2	3/21/2017	--	--	--	--	--	--	--	--	<1.0	8.5	5.5	1.2	--	--	--
3	3/21/2017	--	--	--	--	--	--	--	--	<1.0	1.1	0.33 J	<1.0	--	--	--
4	3/21/2017	--	--	--	--	--	--	--	--	<1.0	1.5	1.2	0.45 J	--	--	--
1	9/28/2017	--	--	--	--	--	--	--	--	<1.0	<1.0	1.6	1.4	--	--	--
2	9/28/2017	--	--	--	--	--	--	--	--	<1.0	8.9	4.9	0.79	--	--	--
3	9/28/2017	--	--	--	--	--	--	--	--	<1.0	0.8	<1.0	<1.0	--	--	--
4	9/28/2017	--	--	--	--	--	--	--	--	<1.0	3.2	1.7	<1.0	--	--	--
1	9/7/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	0.63 J	<1.0	--	--	--
2	9/7/2018	--	--	--	--	--	--	--	--	<1.0	7.9	3.8	<1.0	--	--	--
3	9/7/2018	--	--	--	--	--	--	--	--	<1.0	0.77 J	<1.0	<1.0	--	--	--
4	9/7/2018	--	--	--	--	--	--	--	--	<1.0	3.0	1.5	<1.0	--	--	--
MW-46	6/11/2014	--	--	--	--	--	--	--	--	<1.0	0.67 J	0.50 J	1.1	--	--	--
	12/8/2014	--	--	--	--	--	--	--	--	<1.0	<1.0	0.70 J	2.8	--	--	--
	4/8/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	0.537 J	1.31	--	--	--
	6/29/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	0.74 J	1.1	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	<1.0	0.73 J	2.3	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	<1.0	0.35 J	1	2.7	--	--	--
	3/30/2016	--	--	--	--	--	--	--	--	<1.0	0.35 J	1	2	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters			VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	Chloride (mg/L)	Sulfate (mg/L)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
MW-46	9/27/2016	--	--	--	--	--	--	--	--	<1.0	0.45 J	1.1	2	--	--	--
	4/7/2017	--	--	--	--	--	--	--	--	<1.0	0.54 J	1.5	1.4	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	0.45 J	1.3	1.8	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	<1.0	<1.0	0.95 J	1.6	--	--	--
MW-47	6/11/2014	--	--	--	--	--	--	--	--	<1.0	4.4	600 E	28	--	--	--
	6/11/2014 (dil.)	--	--	--	--	--	--	--	--	<5.0	4.5 J	690	28	--	--	--
	8/28/2014	--	--	--	--	--	--	--	--	<1.0	6.7	356	20.5	--	--	--
	8/28/2014 (DUP)	--	--	--	--	--	--	--	--	<1.0	7.5	300 E	17	--	--	--
	12/8/2014 (dil.)	--	--	--	--	--	--	--	--	<5.0	14	800	148	--	--	--
	4/8/2015 (dil.)	--	--	--	--	--	--	--	--	<5.0	4.81 J	902	38.7	--	--	--
	7/1/2015 (dil.)	--	--	--	--	--	--	--	--	<5.0	4.7 J	908	28	--	--	--
	10/1/2015	--	--	--	--	--	--	--	--	<1.0	11.5	461	32.7	--	--	--
	12/21/2015	--	--	--	--	--	--	--	--	<1.0	3.7 J	609	38.3	--	--	--
	3/30/2016 (dil.)	--	--	--	--	--	--	--	--	<5.0	2.5 J	797	65.5	--	--	--
	7/6/2016	--	--	--	--	--	--	--	--	<1.0	1.9	484	44.9	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	3.3	166	54.9	--	--	--
	12/21/2016	--	--	--	--	--	--	--	--	<1.0	3.7	424	85.9	--	--	--
	4/10/2017	--	--	--	--	--	--	--	--	<1.0	3.1	536	91.5	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	<1.0	1.8	459	85.4	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	3.7	331	78.2	--	--	--
	12/14/2017	--	--	--	--	--	--	--	--	<1.0	2.4	292 B	94.4	--	--	--
	3/29/2018	--	--	--	--	--	--	--	--	<1.0	1.8	298	130	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	<1.0	3.6	433	89.2	--	--	--
	9/6/2018	--	--	--	--	--	--	--	--	<1.0	1.2	226	77.7	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	<1.0	1.7	218	112	--	--	--
MW-47R	3/21/2017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
(15-16.5)	12/30/2015	--	--	--	--	--	--	--	--	<1.0	0.94 J	0.24 J	<1.0	--	--	--
	9/28/2016	--	--	--	--	--	--	--	--	<1.0	4.0	1.7	<1.0	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	2.4	2.6	<1.0	--	--	--
MW-47DR																
(56-57.5)	3/21/2017	--	--	--	--	--	--	--	--	<1.0	4.6	10.6	1.1	--	--	--
(62-63.5)	3/21/2017	--	--	--	--	--	--	--	--	<1.0	2.3	6.2	0.39 J	--	--	--
	3/21/2017	--	--	--	--	--	--	--	--	<1.0	3.4	7.4	0.68 J	--	--	--
	7/5/2017	--	--	--	--	--	--	--	--	<1.0	2.3	9.1	1	--	--	--
	9/27/2017	--	--	--	--	--	--	--	--	<1.0	2.4	9.6	0.95 J	--	--	--
	9/27/2017 (DUP)	--	--	--	--	--	--	--	--	<1.0	2.4	9.3	0.94 J	--	--	--
	12/14/2017	--	--	--	--	--	--	--	--	<1.0	2.0	7.9	0.90 J	--	--	--
	6/20/2018	--	--	--	--	--	--	--	--	<1.0	1.8	7.6	0.82 J	--	--	--
	12/4/2018	--	--	--	--	--	--	--	--	<1.0	1.8	7.7	<1.0	--	--	--
T-1	11/17/2004	--	--	--	--	--	--	--	54	<0	1.5	46	14	21,000	25,000	16,000

Notes:

ORP	Oxidation reduction potential
S.U.	Standard units
mV	Millivolts
ug/L	Micrograms per liter, equivalent to parts per billion (ppb)
mg/L	Milligrams per liter, equivalent to parts per million (ppm)
µmhos/cm	MicroSiemens per centimeter
°C	Degrees Celsius
NTUs	Nephlometric turbidity units
<5	Analytical result was not detected above the laboratory method detection limit
J	Indicates an estimated value
*	Samples acquired via passive diffusion bags (PDBs)
**	Grab sample was taken from this well
E	Estimated value above high calibration standard
D	Dilution
DUP	Duplicate sample
dil.	Diluted sample
--	Not analyzed or not applicable

Table 4-2
Full Scale ERD Injection Well Data
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ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters	VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IW-1	2/21/02	8.86	99	0.81	0.681	18.50	3.1	--	4,090	<100	<20	0.76	63	180
	4/2/02	7.00	-171	0	1.38	21.63	318	--	--	--	--	--	--	--
	5/29/02	4.39	-44	0	8.41	22.73	2,530	--	<50	<250	<58	4.1	32	47
	8/9/02	6.28	-101	6.13	1.4	25.13	127	--	--	--	--	--	--	--
	11/5/02	4.82	-61	0.06	4.4	19.74	5,500	--	--	--	--	--	--	--
	12/9/02	5.21	-192	0.31	2.92	13.44	1,200	--	--	--	--	--	--	--
	1/14/03	5.23	-138	0.93	2.43	17.81	631	--	--	--	--	--	--	--
	3/4/03	4.56	-34	10.24	5.39	19.47	8,730	--	--	--	--	--	--	--
IW-2	2/21/02	7.71	198	1.49	0.695	17.50	<1	--	4,310	<130	<25	4.0	17	53
	4/2/02	8.11	-267	0.13	1.16	19.61	67.9	--	--	--	--	--	--	--
	5/29/02	4.91	-95	0	8.82	21.09	21,500	--	20.3	<130	<29	50	27	43
	8/9/02	6.30	-93	1.79	1.27	21.67	113	--	--	--	--	--	--	--
	11/5/02	6.10	-159	0	1.81	19.26	440	--	--	--	--	--	--	--
	12/9/02	6.32	-147	0.74	1.99	13.92	126	--	--	--	--	--	--	--
	1/14/03	6.55	-88	0.92	1.74	18.05	55.7	--	--	--	--	--	--	--
	3/4/03	4.59	-64	19.99	6.34	19.96	5,520	--	--	--	--	--	--	--
IW-3S	8/29/07	--	--	--	--	--	450	<0.4	0.3	1	<0.2	--	--	--
	9/3/08	--	--	--	--	--	42,000	<0.26	<0.22	0.62	<0.23	--	--	--
	9/23/13	--	--	--	--	--	266	<1.0	<1.0	<1.0	<1.0	--	--	--
IW-4S	1/13/04	7.41	-196.1	0.45	597	19.85	<5	110	1,100	8.1	<3.6	1,900	3,400	4,800
	8/10/04	--	--	--	--	--	7,920	--	--	--	--	--	--	--
	11/17/04	--	--	--	--	--	260	--	--	--	--	--	--	--
	2/9/05	--	--	--	--	--	2,800	--	--	--	--	--	--	--
	5/9/05	--	--	--	--	--	260	--	--	--	--	--	--	--
	8/10/05	--	--	--	--	--	9.1	<0.4	3.2	2.6	3	--	--	--
	10/27/05	--	--	--	--	--	300	--	--	--	--	--	--	--
	12/6/05	--	--	--	--	--	35.6	--	--	--	--	--	--	--
	2/15/06	--	--	--	--	--	660	--	--	--	--	--	--	--
	5/18/06	--	--	--	--	--	500	--	--	--	--	--	--	--
	8/22/06	--	--	--	--	--	26	<0.4	20	36	18	--	--	--
	11/14/06	--	--	--	--	--	17	--	--	--	--	--	--	--
	2/13/07	--	--	--	--	--	5.6	--	--	--	--	--	--	--
	9/4/08	--	--	--	--	--	5.1	<0.26	0.5	3.1	4.5	--	--	--
	3/5/09	--	--	--	--	--	6.1	--	--	--	--	--	--	--
	8/13/09	--	--	--	--	--	<5.0	<0.29	1.0	1.8	5.2	--	--	--
	3/9/10	--	--	--	--	--	<5.0	--	--	--	--	--	--	--
	8/31/10	--	--	--	--	--	1.5	<0.29	<0.17	1.4	2.3	--	--	--
	3/22/11	--	--	--	--	--	1.3	--	--	--	--	--	--	--
	9/15/11	--	--	--	--	--	1.8	<0.10	<0.12	3.9	5.8	--	--	--
	4/4/12	--	--	--	--	--	1.2	--	--	--	--	--	--	--
	8/30/12	--	--	--	--	--	2.9	<1.0	<1.0	2.0	2.8	--	--	--
	3/6/13	--	--	--	--	--	24	--	--	--	--	--	--	--
	4/2/14	--	--	--	--	--	3.9	--	--	--	--	--	--	--
	8/27/14	--	--	--	--	--	9.8	<1.0	1.3	19	47	--	--	--

Table 4-2
Full Scale ERD Injection Well Data
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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters	VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IW-4S	4/7/15	--	--	--	--	--	1.8	--	--	--	--	--	--	--
	10/1/15	--	--	--	--	--	14	<1.0	5.8	25	67.7	--	--	--
	3/31/16	--	--	--	--	--	26	--	--	--	--	--	--	--
	9/28/16	--	--	--	--	--	12	<1.0	3.3	3.7	5.3	--	--	--
	4/10/17	--	--	--	--	--	160	--	--	--	--	--	--	--
	9/28/17	--	--	--	--	--	2.5	--	--	--	--	--	--	--
	3/29/2018	--	--	--	--	--	3.1	--	--	--	--	--	--	--
	9/6/2018	--	--	--	--	--	97	--	--	--	--	--	--	--
IW-5S	1/13/04	7.14	-26.3	0.58	941	21.82	<5	8	930	1.5	2.2	3,400	11,000	5,500
	8/10/04	--	--	--	--	--	208	--	--	--	--	--	--	--
	11/17/04	--	--	--	--	--	900	--	--	--	--	--	--	--
	2/8/05	--	--	--	--	--	150	--	--	--	--	--	--	--
	5/9/05	--	--	--	--	--	1,500	--	--	--	--	--	--	--
	8/10/05	--	--	--	--	--	13	<0.4	22	39	7.5	--	--	--
	10/27/05	--	--	--	--	--	60	--	--	--	--	--	--	--
	12/6/05	--	--	--	--	--	8.4	--	--	--	--	--	--	--
	2/15/06	--	--	--	--	--	290	--	--	--	--	--	--	--
	5/18/06	--	--	--	--	--	260	--	--	--	--	--	--	--
	8/22/06	--	--	--	--	--	410	<0.4	1.7	4.3	1.3	--	--	--
	11/14/06	--	--	--	--	--	710	--	--	--	--	--	--	--
	2/13/07	--	--	--	--	--	5.2	--	--	--	--	--	--	--
	8/29/07	--	--	--	--	--	8.9	0.5	0.4	3.6	2.5	--	--	--
	3/5/09	--	--	--	--	--	9.7	--	--	--	--	--	--	--
	8/13/09	--	--	--	--	--	12	<0.29	<0.28	1.4	0.7	--	--	--
	3/9/10	--	--	--	--	--	<5.0	--	--	--	--	--	--	--
	8/31/10	--	--	--	--	--	2.8	<0.21	2.2	8.5	3.1	--	--	--
	3/22/11	--	--	--	--	--	1.3	--	--	--	--	--	--	--
	9/15/11	--	--	--	--	--	1.2	<0.10	17.0	7.7	2.7	--	--	--
	4/4/12	--	--	--	--	--	1.2	--	--	--	--	--	--	--
	8/30/12	--	--	--	--	--	3.5	<1.0	17.0	11.0	3.8	--	--	--
	3/6/13	--	--	--	--	--	2,100	--	--	--	--	--	--	--
	9/23/13	--	--	--	--	--	8.2	<1.0	12.0	5.3	1.0	--	--	--
	4/2/14	--	--	--	--	--	24.2	<1.0	12.0	5.3	1.0	--	--	--
	8/27/14	--	--	--	--	--	229	<1.0	<1.0	<1.0	0.8 J	--	--	--
	4/7/15	--	--	--	--	--	80	--	--	--	--	--	--	--
	10/1/15	--	--	--	--	--	600	<5.0	<5.0	<5.0	<5.0	--	--	--
	3/31/16	--	--	--	--	--	11	--	--	--	--	--	--	--
	9/28/16	--	--	--	--	--	6.3	<1.0	0.34 J	1.3	0.71 J	--	--	--
	4/10/17	--	--	--	--	--	5.6	--	--	--	--	--	--	--
	9/28/17	--	--	--	--	--	12.2	--	--	--	--	--	--	--
	9/5/18	--	--	--	--	--	29	--	--	--	--	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters	VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IW-8S	1/13/04	7.64	-5.4	1.10	493	16.27	<5	23	170	130	21	1,500	2,100	3,700
	8/10/2004 shallow	--	--	--	--	--	1,920	--	--	--	--	--	--	--
	8/10/2004 deep	--	--	--	--	--	1,930	--	--	--	--	--	--	--
	11/17/04	--	--	--	--	--	25,000	--	--	--	--	--	--	--
	2/8/05	--	--	--	--	--	45	--	--	--	--	--	--	--
	5/9/05	--	--	--	--	--	12,000	--	--	--	--	--	--	--
	8/10/05	--	--	--	--	--	90	<0.4	<0.5	7	1.5	--	--	--
	10/27/05	--	--	--	--	--	14	--	--	--	--	--	--	--
	12/6/05	--	--	--	--	--	10.8	--	--	--	--	--	--	--
	2/15/06	--	--	--	--	--	8,200	--	--	--	--	--	--	--
	5/18/06	--	--	--	--	--	11,000	--	--	--	--	--	--	--
	8/22/06	--	--	--	--	--	26	<0.4	1.2	5.2	2.0	--	--	--
	11/14/06	--	--	--	--	--	14	--	--	--	--	--	--	--
	2/13/07	--	--	--	--	--	5.8	--	--	--	--	--	--	--
	3/5/09	--	--	--	--	--	6.5	--	--	--	--	--	--	--
	3/9/10	--	--	--	--	--	<5.0	--	--	--	--	--	--	--
	8/31/10	--	--	--	--	--	11	<0.21	<0.17	<0.16	<0.11	--	--	--
	3/22/11	--	--	--	--	--	7.2	--	--	--	--	--	--	--
	9/15/11	--	--	--	--	--	8.2	<0.10	<0.12	<0.11	<0.10	--	--	--
	4/4/12	--	--	--	--	--	9.1	--	--	--	--	--	--	--
	8/30/12	--	--	--	--	--	13	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/6/13	--	--	--	--	--	10	--	--	--	--			
	9/23/13	--	--	--	--	--	10.4	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/2/14	--	--	--	--	--	8.4	<1.0	<1.0	<1.0	<1.0	--	--	--
	8/27/14	--	--	--	--	--	11	<1.0	<1.0	<1.0	<1.0	--	--	--
	8/27/2014 (DUP)	--	--	--	--	--	11	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/7/15	--	--	--	--	--	5.3	--	--	--	--	--	--	--
	10/1/15	--	--	--	--	--	13	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/31/16	--	--	--	--	--	6.1	--	--	--	--	--	--	--
	9/28/16	--	--	--	--	--	15	<1.0	<1.0	<1.0	<1.0	--	--	--
	4/10/17	--	--	--	--	--	5.5	--	--	--	--	--	--	--
	9/28/17	--	--	--	--	--	16.4	--	--	--	--	--	--	--
	9/6/18	--	--	--	--	--	7.2	--	--	--	--	--	--	--
IW-11S	12/4/03	--	--	--	--	--	--	<1.0	193	2	<1.0	2	--	--
IW-12S	8/29/07	--	--	--	--	--	2.5	<0.4	<0.3	0.90	0.90	--	--	--
	9/3/08	--	--	--	--	--	<5.0	<0.26	<0.22	0.84	0.52	--	--	--
	8/12/09	--	--	--	--	--	6.3	<0.29	<0.28	0.33	0.54	--	--	--
IW-14S	12/4/03	--	--	--	--	--	--	<1.0	57	13	3	--	--	--

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Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters	VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IW-16S	1/13/04	7.72	-15.7	0.96	424	17.42	<5	3	170	16	1.9	11	58	130
	8/10/04	--	--	--	--	--	2,280	--	--	--	--	--	--	--
	2/8/05	--	--	--	--	--	11,000	--	--	--	--	--	--	--
	5/9/05	--	--	--	--	--	12,000	--	--	--	--	--	--	--
	8/10/05	--	--	--	--	--	2,100	<0.4	2.3	11	<0.3	--	--	--
	10/27/05	--	--	--	--	--	12,000	--	--	--	--	--	--	--
	12/6/05	--	--	--	--	--	1,940	--	--	--	--	--	--	--
	2/15/06	--	--	--	--	--	8,200	--	--	--	--	--	--	--
	5/18/06	--	--	--	--	--	7,900	--	--	--	--	--	--	--
	8/22/06	--	--	--	--	--	290	<0.4	<0.3	3.4	<0.2	--	--	--
	11/14/06	--	--	--	--	--	18	--	--	--	--	--	--	--
	2/13/07	--	--	--	--	--	8	--	--	--	--	--	--	--
	3/5/09	--	--	--	--	--	<5	--	--	--	--	--	--	--
	3/9/10	--	--	--	--	--	5.6	--	--	--	--	--	--	--
	8/31/10	--	--	--	--	--	4.1	<0.21	<0.17	1.2	0.69 J	--	--	--
	3/22/11	--	--	--	--	--	2.9	--	--	--	--	--	--	--
	9/15/11	--	--	--	--	--	2.9	<0.10	<0.12	1.3	0.67 J	--	--	--
	8/30/12	--	--	--	--	--	27	<1.0	<1.0	1.2	0.75 J	--	--	--
	3/6/13	--	--	--	--	--	3,100	--	--	--	--	--	--	--
	9/20/13	--	--	--	--	--	24.5	<1.0	<1.0	0.61 J	<1.0	--	--	--
	4/2/14	--	--	--	--	--	19.1	<1.0	<1.0	0.61 J	<1.0	--	--	--
	8/27/14	--	--	--	--	--	20	<1.0	<1.0	0.66 J	0.48 J	--	--	--
	4/7/15	--	--	--	--	--	4	--	--	--	--	--	--	--
	10/1/15	--	--	--	--	--	2700	<1.0	<1.0	<1.0	<1.0	--	--	--
	3/31/16	--	--	--	--	--	7.7	--	--	--	--	--	--	--
	9/28/16	--	--	--	--	--	19	<1.0	<1.0	0.35 J	<1.0	--	--	--
	4/10/17	--	--	--	--	--	7.8	--	--	--	--	--	--	--
	9/28/17	--	--	--	--	--	35.2	--	--	--	--	--	--	--
	9/5/2018	--	--	--	--	--	87	--	--	--	--	--	--	--
IW-19S	12/4/03	--	--	--	--	--	--	<1.0	31	<1.0	<1.0	--	--	--
IW-20S	8/29/07	--	--	--	--	--	6.8	0.50	<0.3	<0.2	<0.2	--	--	--
	9/3/08	--	--	--	--	--	5.6	<0.26	<0.22	0.32	0.47	--	--	--
	8/13/09	--	--	--	--	--	<5	<0.29	<0.28	<0.20	<0.17	--	--	--
(17.5-19)	4/5/12	--	--	--	--	--	--	<1.0	0.30 J	4.1	2.4	--	--	--
(22.5-24)	4/5/12	--	--	--	--	--	--	<1.0	<1.0	4.0	2.2	--	--	--
(22.5-24 DUP)	4/5/2012 (DUP)	--	--	--	--	--	--	<1.0	<1.0	3.8	2.3	--	--	--
(27-28.5)	4/5/12	--	--	--	--	--	--	<1.0	<1.0	3.6	2.2	--	--	--
(31.5-33)	4/5/12	--	--	--	--	--	--	<1.0	<1.0	3.6	2.1	--	--	--
(36-37.5)	4/5/12	--	--	--	--	--	--	<1.0	<1.0	3.7	2.3	--	--	--
	8/31/12	--	--	--	--	--	--	<1.0	<1.0	0.71 J	0.48 J	--	--	--
	3/6/13	--	--	--	--	--	--	<1.0	<1.0	1.2	<1.0	--	--	--
	3/6/2013 (DUP)	--	--	--	--	--	--	<1.0	<1.0	1.3	<1.0	--	--	--
	5/16/13	--	--	--	--	--	9.4	<1.0	<1.0	1.3	<1.0	--	--	--
	9/20/13	--	--	--	--	--	266	<1.0	0.32 J	0.92 J	0.68 J	--	--	--
	4/2/14	--	--	--	--	--	266	<1.0	<1.0	0.33 J	3.1	--	--	--
	8/28/14	--	--	--	--	--	--	<1.0	<1.0	4.1	<1.0	--	--	--

Table 4-2
Full Scale ERD Injection Well Data
2018 Annual Report Addendum
Ortho Clinical Diagnostics, Raritan, New Jersey

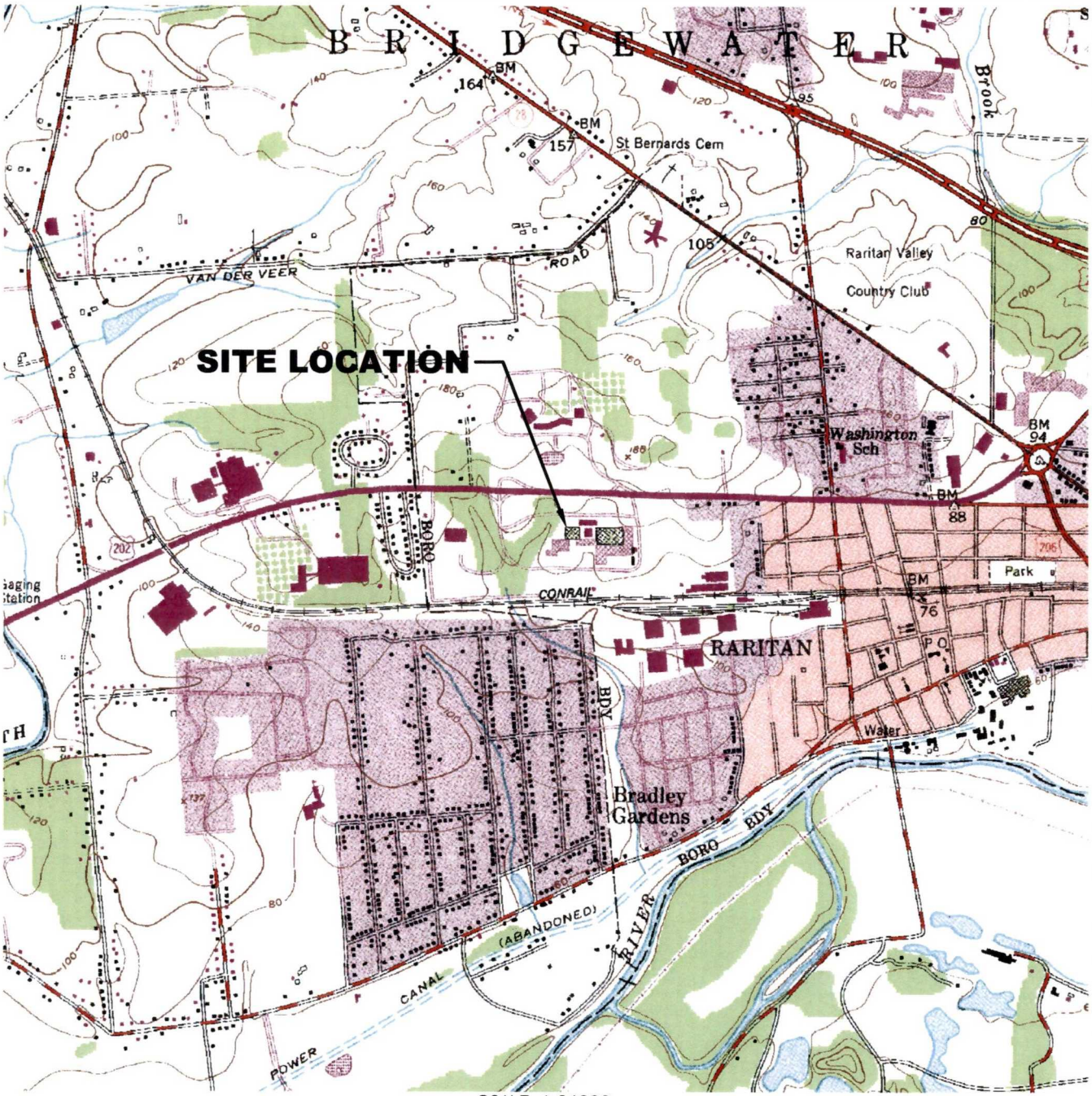
ARCADIS Design & Consultancy for natural and built assets

Well ID	Date	Groundwater Field Parameters					Biogeochemical Parameters	VOCs				Light Hydrocarbons		
		pH (S.U.)	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	TOC (mg/L)	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	VC (µg/L)	Methane (µg/L)	Ethane (ng/L)	Ethene (ng/L)
IW-20S	4/7/15	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--
	10/1/15	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--

Notes:

IW	Injection wells
ORP	Oxidation reduction potential
S.U.	Standard units
mV	Millivolts
µg/L	Micrograms per liter, equivalent to parts per billion (ppb)
mg/L	Milligrams per liter, equivalent to parts per million (ppm)
µmhos/cm	Microsiemens per centimeter
°C	Degrees Celsius
NTUs	Nephlometric turbidity units
<5	Analytical result was not detected above the laboratory method detection limit
J	Indicates an estimated value
--	Not measured or not analyzed

FIGURES



SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

SOURCE: USGS 7.5 MIN. TOPOGRAPHICAL QUADRANGLE RARITAN, NEW JERSEY 1955, PHOTOREVISED 1981.

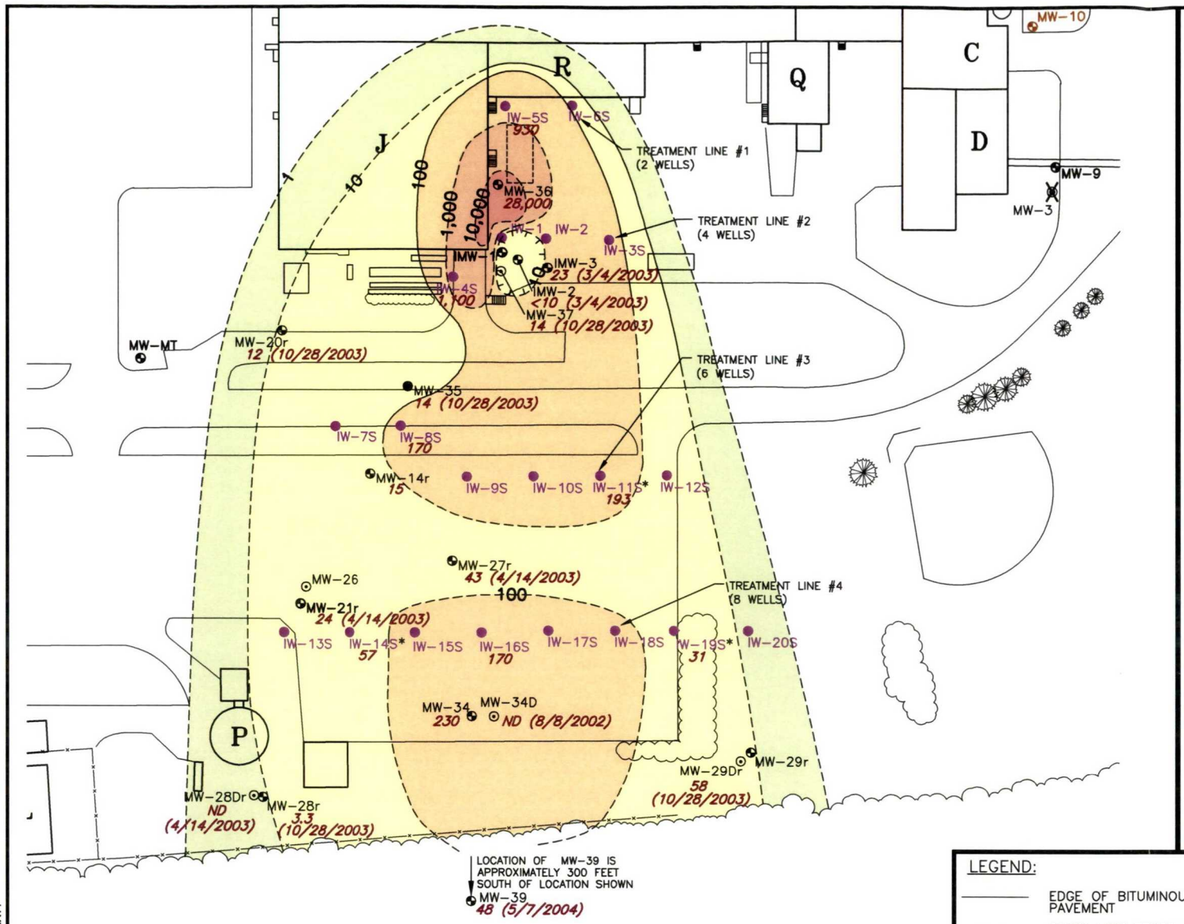
ORTHO CLINICAL DIAGNOSTICS
RARITAN, NEW JERSEY

SITE LOCATION

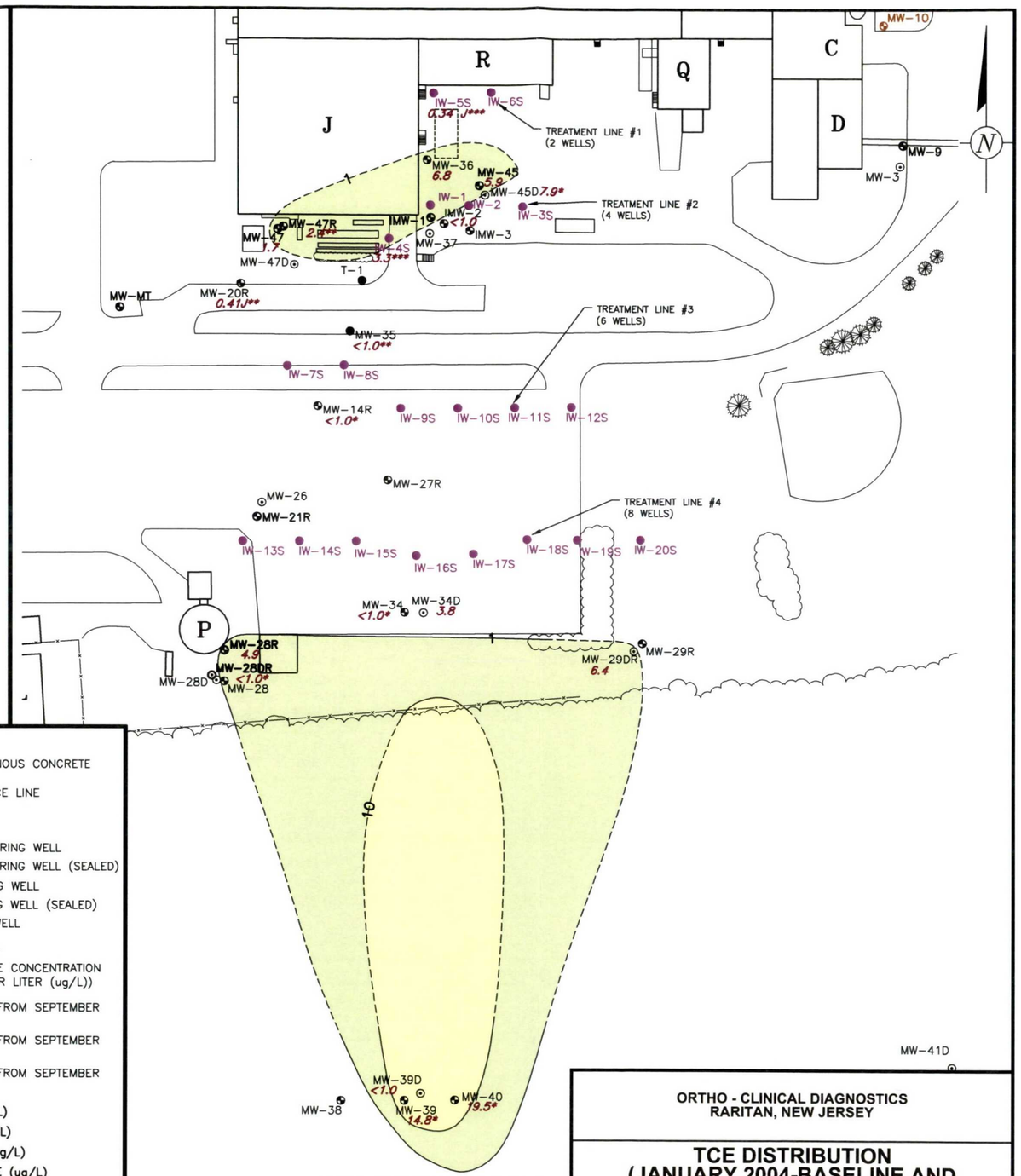
ARCADIS Design & Consultancy for natural and built assets

FIGURE
1-1

CITY:NEWTOWN-PA DIV/GROUP:ENVCAD DB:T.FATTO LD: PIC: PM: P.MILIONIS TM: C.SHARPE LYR: ON=*;OFF=*REF*
C:\ENVCAD\NEWTOWN\ACT\2016\NP005588\0015\00002\DWG\FIG-01 - SITE LOCATION MAP.dwg LAYOUT: 1 SAVED: 4/6/2016 2:30 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS(SIZE A-B).CTB PLOTTED: 4/6/2016 2:30 PM BY: WASILEWSKI, MATT
XREFS: IMAGES: O40074E6.TIF TAYLORS BRIDGE.JPG PROJECTNAME: ---



JANUARY 2004



DECEMBER 2018

LEGEND:

- EDGE OF BITUMINOUS CONCRETE PAVEMENT
- CHAIN LINK FENCE LINE
- TREE LINE
- TREES
- SHALLOW MONITORING WELL
- SHALLOW MONITORING WELL (SEALED)
- DEEP MONITORING WELL
- DEEP MONITORING WELL (SEALED)
- ERD INJECTION WELL
- IRON PILOT WELL
- <1.0 TRICHLOROETHENE CONCENTRATION (MICROGRAMS PER LITER (ug/L))
- * INDICATES DATA FROM SEPTEMBER 2018
- ** INDICATES DATA FROM SEPTEMBER 2017
- *** INDICATES DATA FROM SEPTEMBER 2016
- 1–9.9 TCE (ug/L)
- 10–99 TCE (ug/L)
- 100–999 TCE (ug/L)
- 1,000–9,999 TCE (ug/L)
- >10,000 TCE (ug/L)

NOTES:

1. LOCATIONS OF T-1, MW-39D, MW-45, MW-45D MW-47, MW-47R, AND MW-47D ARE APPROXIMATE (SURVEY DATA UNAVAILABLE).

0 100
SCALE: 1"=100'

ORTHO - CLINICAL DIAGNOSTICS
RARITAN, NEW JERSEY

TCE DISTRIBUTION
(JANUARY 2004-BASELINE AND DECEMBER 2018)

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2-1

CITY: Newtown, Pa DIV/GROUP: ENV DB: M. Wasilewski LD: M. Wasilewski PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ORTHO CLINICAL DIAGNOSTICS\2019\NP000588.0018\00002-Reporting & Data Evaluation\01-DWG\FIG-2.1 TCE DISTRIBUTION (BASELINE JANUARY 2004 AND DECEMBER 2018).dwg LAYOUT: 2-1 SAVED: 4/8/2019 2:10 PM ACADVER: 23.0S (LMS TECH)
PAGESETUP: --- PLOTSTYLETABLE: ARCADIS(SIZE A-B).CTB PLOTTED: 4/8/2019 2:10 PM BY: WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ---

Figure 4-1: MW-36 Molar Concentrations

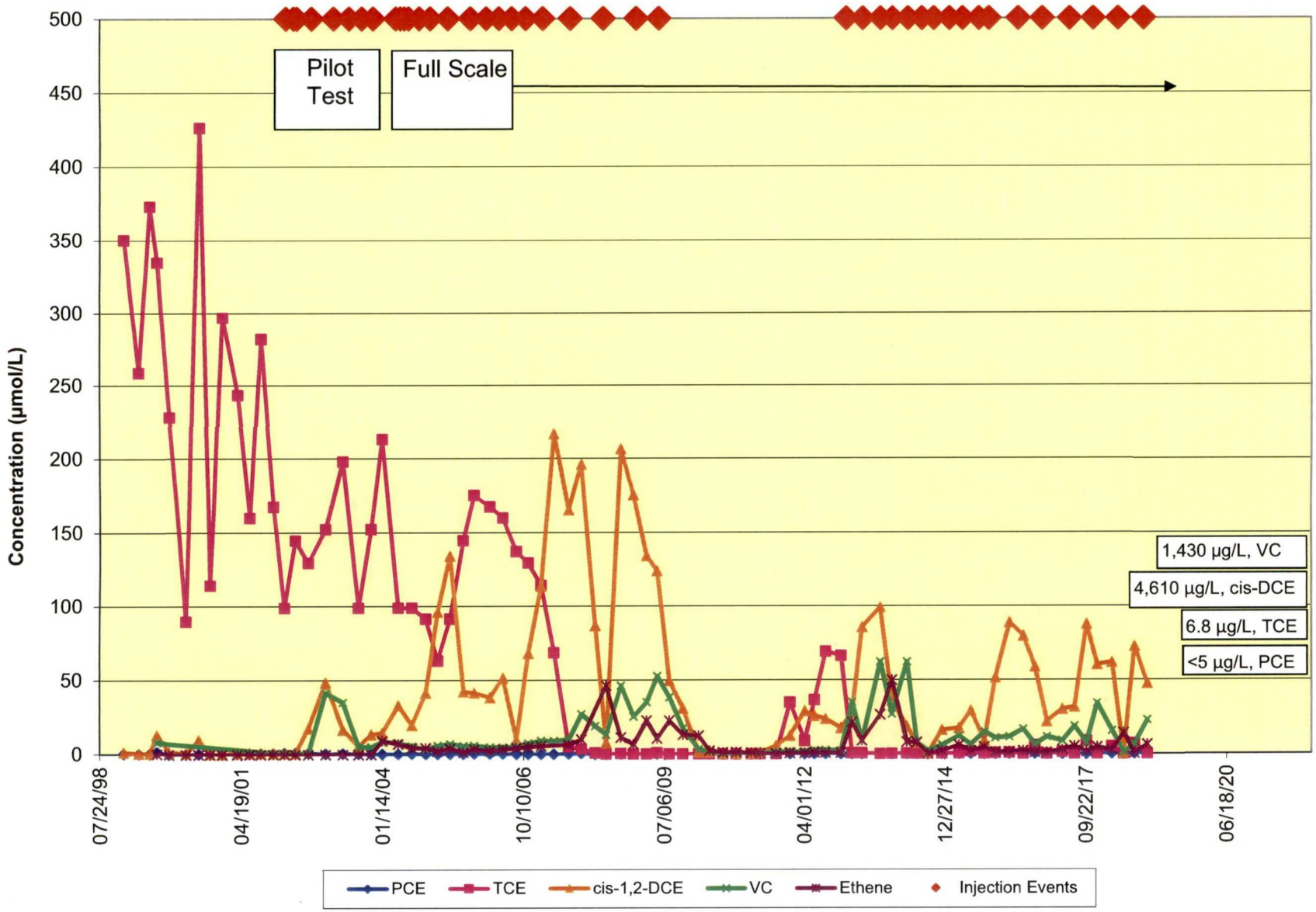


Figure 4-2: MW-14r Molar Concentrations

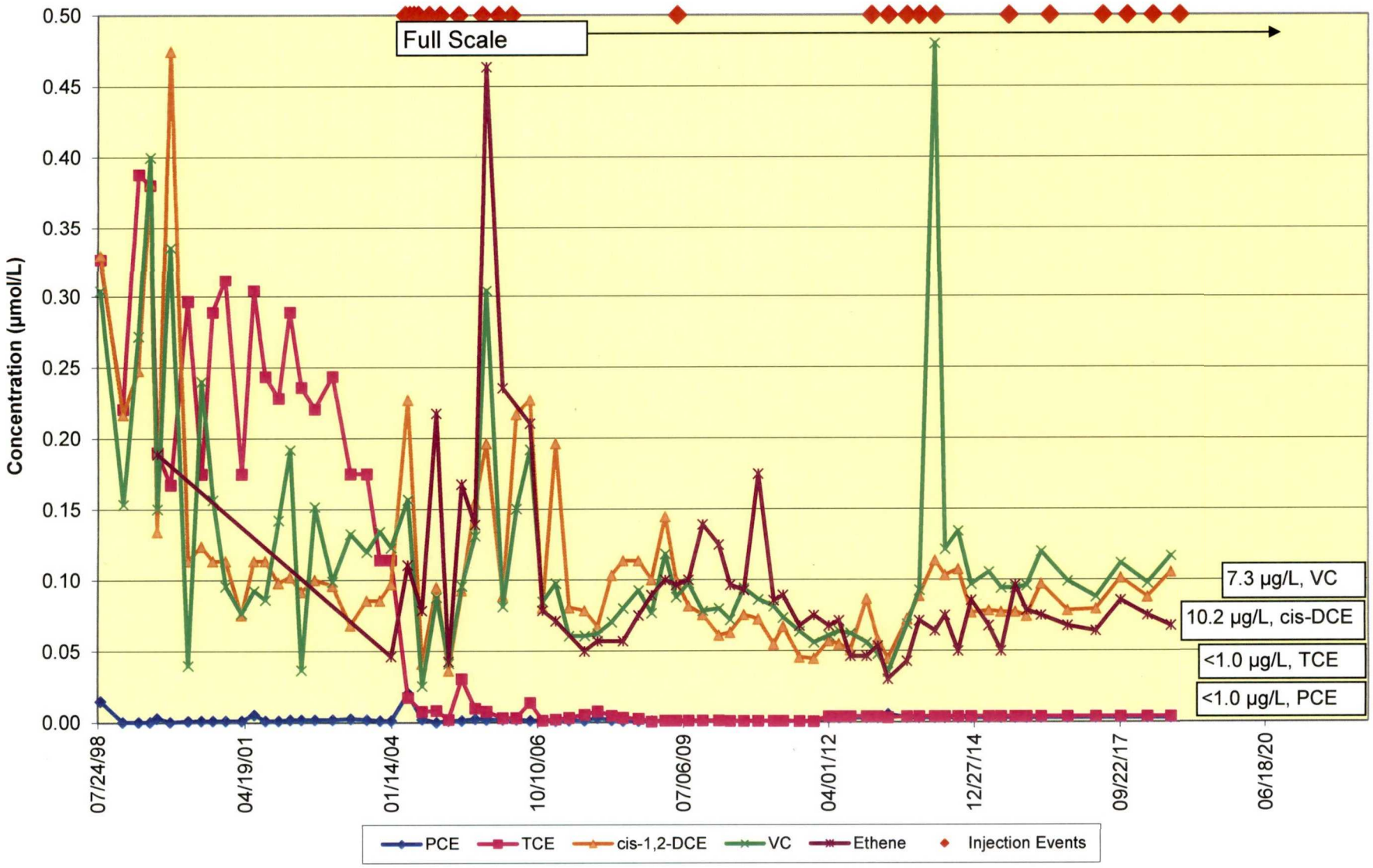
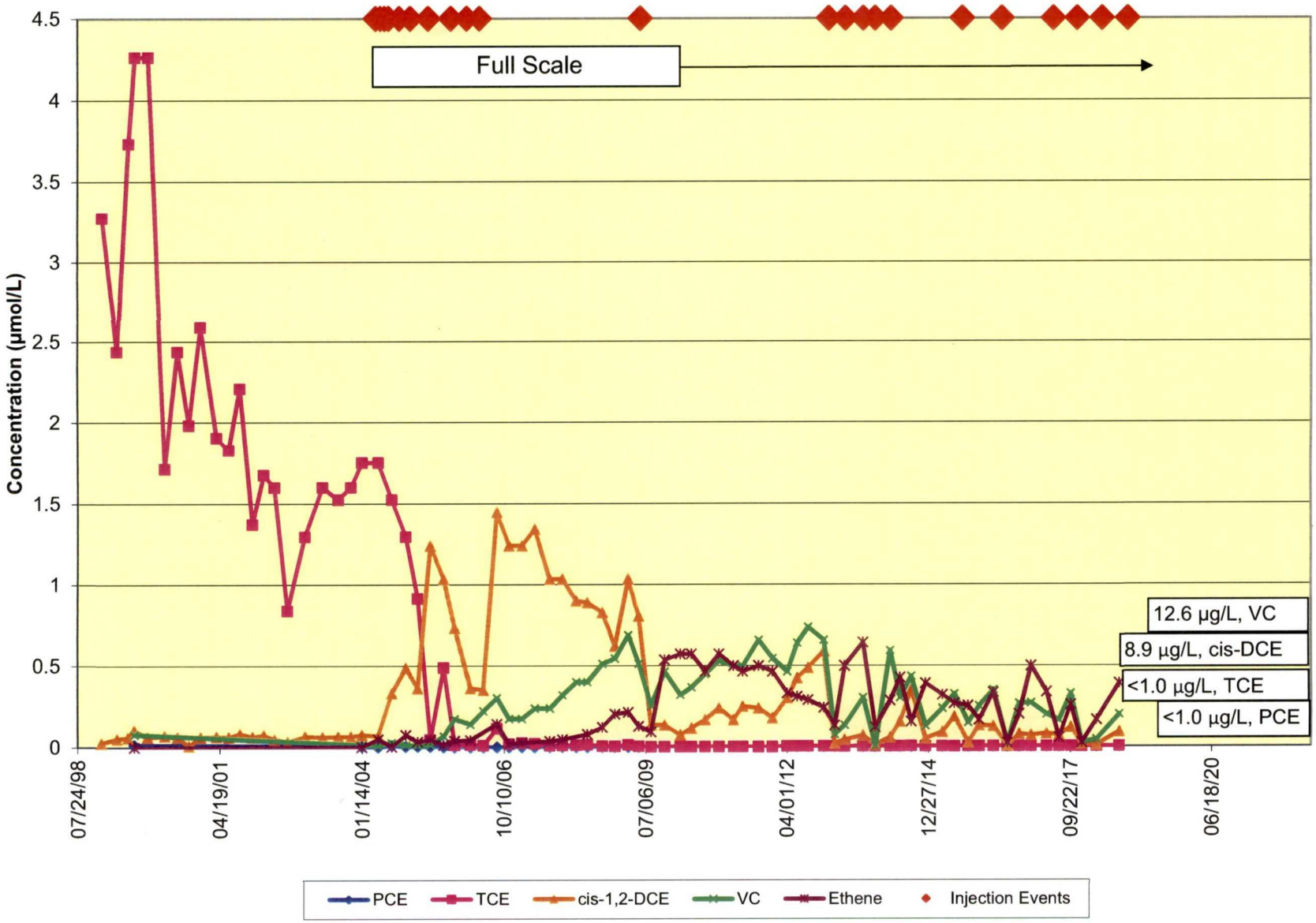


Figure 4-3: MW-34 Molar Concentrations



APPENDIX A

Laboratory Analytical Reports

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

April 9, 2018

Purvee Mittal
Arcadis
One Executive Drive, Suite 303
Chelmsford, MA 01824

RE: **OCD / NP000588**
Pace Workorder: *26227*

Dear Purvee Mittal:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, March 30, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 04/09/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 24

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LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 26227 OCD / NP000588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
262270001	MW-10	Water	3/29/2018 14:30	3/30/2018 08:30
262270002	MW-14R	Water	3/29/2018 15:15	3/30/2018 08:30
262270003	MW-34	Water	3/29/2018 14:55	3/30/2018 08:30
262270004	MW-36	Water	3/29/2018 16:00	3/30/2018 08:30
262270005	MW-39	Water	3/29/2018 11:23	3/30/2018 08:30
262270006	IW-4S	Water	3/29/2018 16:20	3/30/2018 08:30
262270007	IMW-2	Water	3/29/2018 15:30	3/30/2018 08:30

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PROJECT SUMMARY

Workorder: 26227 OCD / NP000588

Workorder Comments

The samples were collected in an alternate container type, than that assigned to PAES method AM20GAx. Sample container was not preserved.

Batch Comments

Batch: EACC/2659 - Anions by IC

The samples were not evaluated against duplicate and spike due to the concentration exceeding the calibration range associated with the assigned reference sample; 262270001. Analyte Chloride. Batch acceptance based on laboratory control sample recovery.

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270001** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **MW-10** Date Collected: 3/29/2018 14:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Sulfate	**27**	mg/l	1.0	0.16	1	3/31/2018 01:45	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270002** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **MW-14R** Date Collected: 3/29/2018 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**3400**	ug/l	1.0	0.040	2	4/6/2018 08:03	BW	d,n
Ethane	**2.4**	ug/l	0.20	0.014	2	4/6/2018 08:03	BW	d,n
Ethene	**2.1**	ug/l	0.20	0.010	2	4/6/2018 08:03	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2.6**	mg/L	1.0	0.085	1	3/30/2018 17:58	MD	
TOC Replicate 2	**2.7**	mg/L	1.0	0.085	1	3/30/2018 17:58	MD	
TOC Replicate 3	**2.7**	mg/L	1.0	0.085	1	3/30/2018 17:58	MD	
TOC Replicate 4	**2.8**	mg/L	1.0	0.085	1	3/30/2018 17:58	MD	
Mean Total Organic Carbon	**2.7**	mg/L	1.0	0.085	1	3/30/2018 17:58	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270003** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **MW-34** Date Collected: 3/29/2018 14:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Methane	**20000**	ug/l	1.0	0.040	2	4/6/2018 08:14	BW	d,n
Ethane	**4.6**	ug/l	0.20	0.014	2	4/6/2018 08:14	BW	d,n
Ethene	**4.7**	ug/l	0.20	0.010	2	4/6/2018 08:14	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**2.0**	mg/L	1.0	0.085	1	3/30/2018 19:02	MD	
TOC Replicate 2	**2.1**	mg/L	1.0	0.085	1	3/30/2018 19:02	MD	
TOC Replicate 3	**2.0**	mg/L	1.0	0.085	1	3/30/2018 19:02	MD	
TOC Replicate 4	**2.1**	mg/L	1.0	0.085	1	3/30/2018 19:02	MD	
Mean Total Organic Carbon	**2.0**	mg/L	1.0	0.085	1	3/30/2018 19:02	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270004** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **MW-36** Date Collected: 3/29/2018 16:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056			Analytical Method: SW-846 9056					
Chloride	**440**	mg/l	10	2.4	10	3/31/2018 15:16	MD	d
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**15000**	ug/l	1.0	0.040	2	4/6/2018 08:26	BW	d,n
Ethane	**110**	ug/l	0.20	0.014	2	4/6/2018 08:26	BW	d,n
Ethene	**71**	ug/l	0.20	0.010	2	4/6/2018 08:26	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2.4**	mg/L	1.0	0.085	1	3/30/2018 20:08	MD	
TOC Replicate 2	**2.5**	mg/L	1.0	0.085	1	3/30/2018 20:08	MD	
TOC Replicate 3	**2.6**	mg/L	1.0	0.085	1	3/30/2018 20:08	MD	
TOC Replicate 4	**2.6**	mg/L	1.0	0.085	1	3/30/2018 20:08	MD	
Mean Total Organic Carbon	**2.5**	mg/L	1.0	0.085	1	3/30/2018 20:08	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270005** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **MW-39** Date Collected: 3/29/2018 11:23

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Sulfate	**35**	mg/l	1.0	0.16	1	3/31/2018 03:15	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270006** Date Received: 3/30/2018 08:30 Matrix: Water

Sample ID: **IW-4S** Date Collected: 3/29/2018 16:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**3.0**	mg/L	1.0	0.085	1	3/31/2018 15:18	MD	
TOC Replicate 2	**3.1**	mg/L	1.0	0.085	1	3/31/2018 15:18	MD	
TOC Replicate 3	**3.1**	mg/L	1.0	0.085	1	3/31/2018 15:18	MD	
TOC Replicate 4	**3.2**	mg/L	1.0	0.085	1	3/31/2018 15:18	MD	
Mean Total Organic Carbon	**3.1**	mg/L	1.0	0.085	1	3/31/2018 15:18	MD	

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ANALYTICAL RESULTS

Workorder: 26227 OCD / NP000588

Lab ID: **262270007** Date Received: 3/30/2018 08:30 Matrix: Water
Sample ID: **IMW-2** Date Collected: 3/29/2018 15:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A	Analytical Method: SW-846 9060A							
TOC Replicate 1	**110**	mg/L	5.0	0.42	5	3/30/2018 21:49	MD	d
TOC Replicate 2	**110**	mg/L	5.0	0.42	5	3/30/2018 21:49	MD	d
TOC Replicate 3	**110**	mg/L	5.0	0.42	5	3/30/2018 21:49	MD	d
TOC Replicate 4	**110**	mg/L	5.0	0.42	5	3/30/2018 21:49	MD	d
Mean Total Organic Carbon	**110**	mg/L	5.0	0.42	5	3/30/2018 21:49	MD	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 26227 OCD / NP000588

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

QC Batch: WET/2284 Analysis Method: SW-846 9060A

QC Batch Method: SW-846 9060A

Associated Lab Samples: 262270002, 262270003, 262270004, 262270007

METHOD BLANK: 54544

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 54545

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	23	104	70-130	
TOC Replicate 2	mg/L	22	23	104	70-130	
TOC Replicate 3	mg/L	22	23	105	70-130	
TOC Replicate 4	mg/L	22	23	105	70-130	
Mean Total Organic Carbon	mg/L	22	23	104	70-130	

MATRIX SPIKE SAMPLE: 54547 Original: 262270003

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	2	20	22	100	70-130	
TOC Replicate 2	mg/L	2.1	20	22	101	70-130	
TOC Replicate 3	mg/L	2	20	22	101	70-130	
TOC Replicate 4	mg/L	2.1	20	22	99	70-130	
Mean Total Organic Carbon	mg/L	2	20	22	101	70-130	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

SAMPLE DUPLICATE: 54546 Original: 262270002

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	2.6	2.8	4.9	20	
TOC Replicate 2	mg/L	2.7	2.7	0.84	20	
TOC Replicate 3	mg/L	2.7	2.8	6.6	20	
TOC Replicate 4	mg/L	2.8	2.8	0.6	20	
Mean Total Organic Carbon	mg/L	2.7	2.8	2.8	20	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

QC Batch: WET/2285 Analysis Method: SW-846 9060A
QC Batch Method: SW-846 9060A
Associated Lab Samples: 262270006

METHOD BLANK: 54548

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 54549

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	23	104	70-130	
TOC Replicate 2	mg/L	22	23	104	70-130	
TOC Replicate 3	mg/L	22	23	104	70-130	
TOC Replicate 4	mg/L	22	23	104	70-130	
Mean Total Organic Carbon	mg/L	22	23	104	70-130	

MATRIX SPIKE SAMPLE: 54551 Original: 262270006

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	3	20	22	97	70-130	
TOC Replicate 2	mg/L	3.1	20	23	97	70-130	
TOC Replicate 3	mg/L	3.1	20	22	95	70-130	
TOC Replicate 4	mg/L	3.2	20	22	96	70-130	
Mean Total Organic Carbon	mg/L	3.1	20	22	96	70-130	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

SAMPLE DUPLICATE: 54550 Original: 262270006

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	3	3	1.7	20	
TOC Replicate 2	mg/L	3.1	3.2	1.2	20	
TOC Replicate 3	mg/L	3.1	3.1	2.4	20	
TOC Replicate 4	mg/L	3.2	3.1	2.7	20	
Mean Total Organic Carbon	mg/L	3.1	3.1	0.58	20	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

QC Batch: EACC/2659 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 262270001, 262270005

METHOD BLANK: 54552

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Sulfate	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 54553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Sulfate	mg/l	10	10	103	80-120	

MATRIX SPIKE SAMPLE: 54555 Original: 262270001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
EAcceptors							
Sulfate	mg/l	27	10	35	87	80-120	

SAMPLE DUPLICATE: 54554 Original: 262270001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
EAcceptors						
Sulfate	mg/l	27	27	0.1	20	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

QC Batch: EACC/2660 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 262270004

METHOD BLANK: 54576

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Chloride	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 54577

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Chloride	mg/l	10	10	101	80-120	

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QUALITY CONTROL DATA

Workorder: 26227 OCD / NP000588

QC Batch: DISG/6753 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 262270002, 262270003, 262270004

METHOD BLANK: 54589

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.50 U	0.50	n
Ethane	ug/l	0.10 U	0.10	n
Ethene	ug/l	0.10 U	0.10	n

LABORATORY CONTROL SAMPLE & LCSD: 54590 54591

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	750	730	750	97	101	80-120	3.2	20	n
Ethane	ug/l	38	39	40	104	107	80-120	2.5	20	n
Ethene	ug/l	35	37	38	105	108	80-120	2.6	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 26227 OCD / NP000588

QUALITY CONTROL PARAMETER QUALIFIERS

n The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 26227 OCD / NP000588

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
262270002	MW-14R			SW-846 9060A	WET/2284
262270003	MW-34			SW-846 9060A	WET/2284
262270004	MW-36			SW-846 9060A	WET/2284
262270007	IMW-2			SW-846 9060A	WET/2284
262270006	IW-4S			SW-846 9060A	WET/2285
262270001	MW-10			SW-846 9056	EACC/2659
262270005	MW-39			SW-846 9056	EACC/2659
262270004	MW-36			SW-846 9056	EACC/2660
262270002	MW-14R			AM20GAX	DISG/6753
262270003	MW-34			AM20GAX	DISG/6753
262270004	MW-36			AM20GAX	DISG/6753

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

26227

Page: 1 of 1

010947

Section A Required Client Information:

Company: ARCADIS
Address: 10 Friends Lane
Newtown, PA 18940
Email To:
Phone: 978 322 4536 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Purvee Mittal
Copy To: purvee.mittal@arcadis-us.com
Purchase Order No.:
Project Name: OCD
Project Number: NP000588

Section C Invoice Information:

Attention: Accounts Payable
Company Name: ARCADIS
Address: 630 Plaza Dr, Suite 100
Pace Quote Reference: Highlands Ranch, CO
Pace Project Manager: 80129
Pace Profile #:

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER

Site Location STATE: NJ

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N) TOC	Ethene, Ethane, Methane	Sulfate	Chloride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-10	WT	G			3/29/18	14:30		2	2										X			
2	MW-14r	↓	↓			↓	15:15		3	2	1							X	X				
3	MW-34	↓	↓			↓	14:55		3	2	1							X	X				
4	MW-36	↓	↓			↓	16:00		5	4	1							X	X		X		
5	MW-39	↓	↓			↓	11:23		2	2										X			
* 6	IW-4S	↓	↓			↓	16:20		1		1							X					
7	IMW-2	↓	↓			↓	15:30		1		1							X					
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* MW-4S is preserved w/	Steven B. Nell/SZC2	3/29/18	17:15	Leon : PACS	3.30.18	0830	3.8	Y	N	
H_2SO_4 even though the										
label colors suggest										
otherwise.										

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15 Jan 2007

Cooler Receipt Form

Client Name: Amadis **Project:** OCD/NP000588 **Lab Work Order:** 26227

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ **Air bill Present:** Yes No

Tracking Number: 780309162378

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None **Ice Intact:** Yes Melted

Cooler Temperature: 3.8°C **Radiation Screened:** Yes No **Chain of Custody Present:** Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC		✓		
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform	✓			If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?	✓			

Comments:_____

Cooler contents examined/received by: LG **Date:** 3.30.18

Project Manager Review: _____ **Date:** 3/30/18

pH SCREENING FORM

Client Arcadis Client Project OCD/NP020588

PAES WO# 26227

Completed by LY Date 3.30.18

Page 1 of 1

No.	Sample	Preservative							pH
		HNO_3	H_2SO_4	HCl	None	BAK	$NaOH$	$NaOH$+ ZnAc	
1.	MW-14R		X						<2.0
2.	MW-34		X						<2.0
3.	MW-36		X						<2.0
4.	IW-4S		X						<2.0
5.	IMW-2		X						<2.0

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April 26, 2018

Purvee Mittal
Arcadis
One Executive Drive, Suite 303
Chelmsford, MA 01824

RE: **OCD / NP000588**
Pace Workorder: 26454

Dear Purvee Mittal:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, April 19, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 04/26/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 11

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LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 26454 OCD / NP000588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
264540001	IMW-2	Water	4/18/2018 14:20	4/19/2018 10:45

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PROJECT SUMMARY

Workorder: 26454 OCD / NP000588

Workorder Comments

The sample 26454 (0001) was collected in an alternate container type, than that assigned to PAES method AM20GAx. Sample container was 20ml capacity and not preserved.

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ANALYTICAL RESULTS

Workorder: 26454 OCD / NP000588

Lab ID: **264540001** Date Received: 4/19/2018 10:45 Matrix: Water
Sample ID: **IMW-2** Date Collected: 4/18/2018 14:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Methane	**16000**	ug/l	1.0	0.040	2	4/20/2018 09:41	BW	d,n
Ethane	**1.7**	ug/l	0.20	0.014	2	4/20/2018 09:41	BW	d,n
Ethene	**0.16J**	ug/l	0.20	0.010	2	4/20/2018 09:41	BW	d,n

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 26454 OCD / NP000588

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 26454 OCD / NP000588

QC Batch: DISG/6786 Analysis Method: AM20GAX
QC Batch Method: AM20GAX
Associated Lab Samples: 264540001

METHOD BLANK: 54857

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.50 U	0.50	n
Ethane	ug/l	0.10 U	0.10	n
Ethene	ug/l	0.10 U	0.10	n

LABORATORY CONTROL SAMPLE & LCSD: 54858 54859

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	750	760	800	102	107	80-120	4.9	20	n
Ethane	ug/l	38	39	40	104	106	80-120	2	20	n
Ethene	ug/l	35	35	37	99	105	80-120	5.1	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 26454 OCD / NP000588

QUALITY CONTROL PARAMETER QUALIFIERS

n The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 26454 OCD / NP000588

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
264540001	IMW-2			AM20GAX	DISG/6786

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26454

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

006516

Section A Required Client Information:

Company: Arcadis
Address: 10 Friends Lane
Newtown, PA 18940
Email To:
Phone: 978 322 4536 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Purvee Mittal
Copy To: Purvee.mittal@arcadis-us.com
Purchase Order No.:
Project Name: OCD
Project Number: NP000588

Section C Invoice Information:

Attention: Accounts Payable
Company Name: Arcadis
Address: 630 Plaza Dr Suite 100
Highlands Ranch, CO 80129
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NJ

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N)	Ethane, Ethene, Methane	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IMW-2	WT	G			4/18/18	1420		2	2									✓		
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature]	4/18/18	1500	[signature] PDS	4.19.18	1045	5	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Jul-2007

Cooler Receipt Form

Client Name: Arcadis **Project:** OCD/NP000588 **Lab Work Order:** 26454

A. Shipping/Container Information (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 780579670967

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 5°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags			✓	
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?		✓		

Comments:_____

Cooler contents examined/received by : LJ **Date:** 4.19.18

Project Manager Review: [signature] **Date:** 4/19/18

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

July 3, 2018

Purvee Mittal
Arcadis
One Executive Drive, Suite 303
Chelmsford, MA 01824

RE: **OCD / NP000588**
Pace Workorder: 27211

Dear Purvee Mittal:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, June 21, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 07/03/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 18

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220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 27211 OCD / NP000588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
272110001	MW-36	Water	6/20/2018 16:00	6/21/2018 08:00
272110002	IMW-2	Water	6/20/2018 15:30	6/21/2018 08:00

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PROJECT SUMMARY

Workorder: 27211 OCD / NP000588

Workorder Comments

The samples were collected in an alternate container type, than that assigned to PAES method AM20GAx. The sample containers were not preserved.

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ANALYTICAL RESULTS

Workorder: 27211 OCD / NP000588

Lab ID: **272110001** Date Received: 6/21/2018 08:00 Matrix: Water
Sample ID: **MW-36** Date Collected: 6/20/2018 16:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Chloride	**240**	mg/l	10	2.4	10	6/22/2018 16:45	MD	d
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Methane	**15000**	ug/l	1.0	0.040	2	6/26/2018 09:49	BW	d,n
Ethane	**68**	ug/l	0.20	0.014	2	6/26/2018 09:49	BW	d,n
Ethene	**400**	ug/l	0.20	0.010	2	6/26/2018 09:49	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**15**	mg/L	1.0	0.085	1	6/27/2018 04:08	MD	
TOC Replicate 2	**15**	mg/L	1.0	0.085	1	6/27/2018 04:08	MD	
TOC Replicate 3	**15**	mg/L	1.0	0.085	1	6/27/2018 04:08	MD	
TOC Replicate 4	**15**	mg/L	1.0	0.085	1	6/27/2018 04:08	MD	
Mean Total Organic Carbon	**15**	mg/L	1.0	0.085	1	6/27/2018 04:08	MD	

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ANALYTICAL RESULTS

Workorder: 27211 OCD / NP000588

Lab ID: **272110002** Date Received: 6/21/2018 08:00 Matrix: Water

Sample ID: **IMW-2** Date Collected: 6/20/2018 15:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**14000**	ug/l	1.0	0.040	2	6/26/2018 11:04	BW	d,n
Ethane	**1.3**	ug/l	0.20	0.014	2	6/26/2018 11:04	BW	d,n
Ethene	**0.42**	ug/l	0.20	0.010	2	6/26/2018 11:04	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2800**	mg/L	100	8.5	100	6/27/2018 19:33	MD	d
TOC Replicate 2	**2800**	mg/L	100	8.5	100	6/27/2018 19:33	MD	d
TOC Replicate 3	**2800**	mg/L	100	8.5	100	6/27/2018 19:33	MD	d
TOC Replicate 4	**2800**	mg/L	100	8.5	100	6/27/2018 19:33	MD	d
Mean Total Organic Carbon	**2800**	mg/L	100	8.5	100	6/27/2018 19:33	MD	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 27211 OCD / NP000588

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

QC Batch: DISG/6921 Analysis Method: AM20GAX
QC Batch Method: AM20GAX
Associated Lab Samples: 272110001, 272110002

METHOD BLANK: 56138

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.50 U	0.50	n
Ethane	ug/l	0.10 U	0.10	n
Ethene	ug/l	0.10 U	0.10	n

LABORATORY CONTROL SAMPLE & LCSD: 56139 56140

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	750	710	740	95	99	80-120	4.2	20	n
Ethane	ug/l	38	41	41	108	109	80-120	1.7	20	n
Ethene	ug/l	35	38	38	107	108	80-120	0.71	20	n

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

QC Batch: EACC/2708 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 272110001

METHOD BLANK: 56149

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Chloride	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 56150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Chloride	mg/l	10	11	113	80-120	

MATRIX SPIKE SAMPLE: 56152 Original: 272110001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
EAcceptors							
Chloride	mg/l	240	100	340	101	80-120	d

SAMPLE DUPLICATE: 56151 Original: 272110001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
EAcceptors						
Chloride	mg/l	240	240	0.26	20	d

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

QC Batch: WET/2300 Analysis Method: SW-846 9060A
QC Batch Method: SW-846 9060A
Associated Lab Samples: 272110001

METHOD BLANK: 56233

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

METHOD BLANK: 56243

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 56234

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	21	96	70-130	
TOC Replicate 2	mg/L	22	22	99	70-130	
TOC Replicate 3	mg/L	22	22	98	70-130	
TOC Replicate 4	mg/L	22	22	98	70-130	
Mean Total Organic Carbon	mg/L	22	22	98	70-130	

LABORATORY CONTROL SAMPLE: 56244

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	22	99	70-130	

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

LABORATORY CONTROL SAMPLE: 56244

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TOC Replicate 2	mg/L	22	21	98	70-130	
TOC Replicate 3	mg/L	22	21	96	70-130	
TOC Replicate 4	mg/L	22	21	96	70-130	
Mean Total Organic Carbon	mg/L	22	21	97	70-130	

MATRIX SPIKE SAMPLE: 56236 Original: 271950002

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	0.24	20	17	85	70-130	
TOC Replicate 2	mg/L	0.37	20	17	83	70-130	
TOC Replicate 3	mg/L	0.24	20	17	85	70-130	
TOC Replicate 4	mg/L	0.31	20	17	85	70-130	
Mean Total Organic Carbon	mg/L	0.29	20	17	84	70-130	

SAMPLE DUPLICATE: 56235 Original: 271950001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	8.3	8.2	0.74	20	
TOC Replicate 2	mg/L	8.6	8.3	3.4	20	
TOC Replicate 3	mg/L	8.6	8.4	2.5	20	
TOC Replicate 4	mg/L	8.5	8.5	0.047	20	
Mean Total Organic Carbon	mg/L	8.5	8.4	1.7	20	

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

QC Batch: WET/2301 Analysis Method: SW-846 9060A
QC Batch Method: SW-846 9060A
Associated Lab Samples: 272110002

METHOD BLANK: 56249

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 56250

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	21	96	70-130	
TOC Replicate 2	mg/L	22	21	96	70-130	
TOC Replicate 3	mg/L	22	20	94	70-130	
TOC Replicate 4	mg/L	22	21	94	70-130	
Mean Total Organic Carbon	mg/L	22	21	95	70-130	

MATRIX SPIKE SAMPLE: 56252 Original: 272110002

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	2800	2000	4500	83	70-130	d
TOC Replicate 2	mg/L	2800	2000	4600	86	70-130	d
TOC Replicate 3	mg/L	2800	2000	4600	88	70-130	d
TOC Replicate 4	mg/L	2800	2000	4600	88	70-130	d
Mean Total Organic Carbon	mg/L	2800	2000	4600	86	70-130	d

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QUALITY CONTROL DATA

Workorder: 27211 OCD / NP000588

SAMPLE DUPLICATE: 56251 Original: 272110002

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	2800	2800	2.2	20	d
TOC Replicate 2	mg/L	2800	2800	0.63	20	d
TOC Replicate 3	mg/L	2800	2800	0.089	20	d
TOC Replicate 4	mg/L	2800	2800	0.69	20	d
Mean Total Organic Carbon	mg/L	2800	2800	0.86	20	d

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 27211 OCD / NP000588

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 27211 OCD / NP000588

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
272110001	MW-36			AM20GAX	DISG/6921
272110002	IMW-2			AM20GAX	DISG/6921
272110001	MW-36			SW-846 9056	EACC/2708
272110001	MW-36			SW-846 9060A	WET/2300
272110002	IMW-2			SW-846 9060A	WET/2301

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

27211

Page: 1 of 1

011446

Section A Required Client Information:

Company: ARCADIS
Address: 10 Friends Lane
Newtown, PA 18940
Email To:
Phone: 978 322 4536 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Purvee Mittal
Copy To: Purvee.mittal@arcadis-us.com
Purchase Order No.:
Project Name: OCD
Project Number: NP 000588

Section C Invoice Information:

Attention: Accounts Payable
Company Name: ARCADIS
Address: 630 Plaza Dr. Suite 100
Pace Quote Reference: Highlands Ranch, CO
Pace Project Manager: 80129
Pace Profile #:

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER

Site Location STATE: NJ

Requested Analysis Filtered (Y/N): Y, N, N

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N): TOC	Ethane, Ethene, Methane	chloride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-36	WT	G			6/20/18	16:00		5	4	1							X	X	X		
2	IMW-2	WT	G			6/20/18	15:30		3	2	1							X	X			
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Requested unpreserved glassware for light hydrocarbons. VOA vials had red covers. There may have been a preservative residue. Samples fizzed when put into vials.	Steven B Bell / SZC2	6/20/18	17:45	[illegible] PACS	6.21.18	0800	5	Y	N	

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: Arcadis **Project:** OCD **Lab Work Order:** 27211

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ **Air bill Present:** Yes No

Tracking Number: 781515796900

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None **Ice Intact:** Yes Melted

Cooler Temperature: 5°C **Radiation Screened:** Yes No **Chain of Custody Present:** Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC		✓		
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform	✓			If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?	✓			

Comments:_____

Cooler contents examined/received by : LY **Date:** 6.21.18

Project Manager Review : RW **Date:** 6-21-18

pH SCREENING FORM

Client Arcadis Client Project OCD

PAES WO# 27211

Completed by LY Date 6.21.18

Page 1 of 1

No.	Sample	Preservative							pH
		HNO_3	H_2SO_4	HCl	None	BAK	NaOH	NaOH+ ZnAc	
1.	MW-36		X						<2.0
2.	IMW-2		X						<2.0

Pace Analytical Energy Services LLC
220 William Pitt Way
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Phone: (412) 826-5245
Fax: (412) 826-3433

September 18, 2018

Purvee Mittal
Arcadis
One Executive Drive, Suite 303
Chelmsford, MA 01824

RE: **OCD / NP000588**
Pace Workorder: *27971*

Dear Purvee Mittal:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, September 06, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 09/18/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 29

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LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 27971 OCD / NP000588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
279710001	MW-10	Water	9/5/2018 11:15	9/6/2018 08:30
279710002	MW-14R	Water	9/5/2018 11:15	9/6/2018 08:30
279710003	MW-29DR	Water	9/5/2018 16:15	9/6/2018 08:30
279710004	MW-34	Water	9/5/2018 16:15	9/6/2018 08:30
279710005	MW-34D	Water	9/5/2018 12:25	9/6/2018 08:30
279710006	MW-36	Water	9/5/2018 15:00	9/6/2018 08:30
279710007	MW-39	Water	9/5/2018 13:25	9/6/2018 08:30
279710008	IW-4S	Water	9/5/2018 16:30	9/6/2018 08:30
279710009	IW-5S	Water	9/5/2018 15:30	9/6/2018 08:30
279710010	IW-8S	Water	9/5/2018 17:00	9/6/2018 08:30
279710011	IW-16S	Water	9/5/2018 17:15	9/6/2018 08:30

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PROJECT SUMMARY

Workorder: 27971 OCD / NP000588

Workorder Comments

The samples 27971 (0002, 0004, 0006) were collected in an alternate container type, than that assigned to PAES method AM20GAx. The sample container was not preserved and capped with silicone septa.

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710001** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-10** Date Collected: 9/5/2018 11:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Sulfate	**26**	mg/l	1.0	0.20	1	9/6/2018 16:54	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710002** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-14R** Date Collected: 9/5/2018 11:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**2200**	ug/l	1.0	0.028	2	9/14/2018 08:04	BW	d,n
Ethane	**2.0**	ug/l	0.20	0.014	2	9/14/2018 08:04	BW	d,n
Ethene	**1.9**	ug/l	0.20	0.010	2	9/14/2018 08:04	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2.7**	mg/L	1.0	0.33	1	9/6/2018 18:03	MD	
TOC Replicate 2	**2.8**	mg/L	1.0	0.33	1	9/6/2018 18:03	MD	
TOC Replicate 3	**2.8**	mg/L	1.0	0.33	1	9/6/2018 18:03	MD	
TOC Replicate 4	**2.9**	mg/L	1.0	0.33	1	9/6/2018 18:03	MD	
Mean Total Organic Carbon	**2.8**	mg/L	1.0	0.33	1	9/6/2018 18:03	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710003** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-29DR** Date Collected: 9/5/2018 16:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**0.52J**	mg/L	1.0	0.33	1	9/6/2018 19:09	MD	
TOC Replicate 2	**0.53J**	mg/L	1.0	0.33	1	9/6/2018 19:09	MD	
TOC Replicate 3	**0.53J**	mg/L	1.0	0.33	1	9/6/2018 19:09	MD	
TOC Replicate 4	**0.50J**	mg/L	1.0	0.33	1	9/6/2018 19:09	MD	
Mean Total Organic Carbon	**0.52J**	mg/L	1.0	0.33	1	9/6/2018 19:09	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710004** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-34** Date Collected: 9/5/2018 16:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**11000**	ug/l	1.0	0.028	2	9/14/2018 08:15	BW	d,n
Ethane	**2.2**	ug/l	0.20	0.014	2	9/14/2018 08:15	BW	d,n
Ethene	**11**	ug/l	0.20	0.010	2	9/14/2018 08:15	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**1.5**	mg/L	1.0	0.33	1	9/6/2018 20:15	MD	
TOC Replicate 2	**1.6**	mg/L	1.0	0.33	1	9/6/2018 20:15	MD	
TOC Replicate 3	**1.6**	mg/L	1.0	0.33	1	9/6/2018 20:15	MD	
TOC Replicate 4	**1.6**	mg/L	1.0	0.33	1	9/6/2018 20:15	MD	
Mean Total Organic Carbon	**1.6**	mg/L	1.0	0.33	1	9/6/2018 20:15	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710005** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-34D** Date Collected: 9/5/2018 12:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:21	MD	
TOC Replicate 2	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:21	MD	
TOC Replicate 3	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:21	MD	
TOC Replicate 4	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:21	MD	
Mean Total Organic Carbon	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:21	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710006** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-36** Date Collected: 9/5/2018 15:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056			Analytical Method: SW-846 9056					
Chloride	**340**	mg/l	25	10	25	9/7/2018 18:18	MD	d
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**11000**	ug/l	1.0	0.028	2	9/14/2018 08:26	BW	d,n
Ethane	**53**	ug/l	0.20	0.014	2	9/14/2018 08:26	BW	d,n
Ethene	**13**	ug/l	0.20	0.010	2	9/14/2018 08:26	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2.9**	mg/L	1.0	0.33	1	9/6/2018 21:53	MD	
TOC Replicate 2	**2.8**	mg/L	1.0	0.33	1	9/6/2018 21:53	MD	
TOC Replicate 3	**2.8**	mg/L	1.0	0.33	1	9/6/2018 21:53	MD	
TOC Replicate 4	**2.7**	mg/L	1.0	0.33	1	9/6/2018 21:53	MD	
Mean Total Organic Carbon	**2.8**	mg/L	1.0	0.33	1	9/6/2018 21:53	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710007** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **MW-39** Date Collected: 9/5/2018 13:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Sulfate	**35**	mg/l	1.0	0.20	1	9/6/2018 18:24	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710008** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **IW-4S** Date Collected: 9/5/2018 16:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**95**	mg/L	5.0	1.6	5	9/7/2018 00:41	MD	d
TOC Replicate 2	**97**	mg/L	5.0	1.6	5	9/7/2018 00:41	MD	d
TOC Replicate 3	**98**	mg/L	5.0	1.6	5	9/7/2018 00:41	MD	d
TOC Replicate 4	**99**	mg/L	5.0	1.6	5	9/7/2018 00:41	MD	d
Mean Total Organic Carbon	**97**	mg/L	5.0	1.6	5	9/7/2018 00:41	MD	d

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Workorder: 27971 OCD / NP000588

Lab ID: **279710009** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **IW-5S** Date Collected: 9/5/2018 15:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**28**	mg/L	5.0	1.6	5	9/7/2018 01:13	MD	d
TOC Replicate 2	**29**	mg/L	5.0	1.6	5	9/7/2018 01:13	MD	d
TOC Replicate 3	**29**	mg/L	5.0	1.6	5	9/7/2018 01:13	MD	d
TOC Replicate 4	**29**	mg/L	5.0	1.6	5	9/7/2018 01:13	MD	d
Mean Total Organic Carbon	**29**	mg/L	5.0	1.6	5	9/7/2018 01:13	MD	d

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710010** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **IW-8S** Date Collected: 9/5/2018 17:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**6.9**	mg/L	1.0	0.33	1	9/7/2018 18:05	MD	
TOC Replicate 2	**7.2**	mg/L	1.0	0.33	1	9/7/2018 18:05	MD	
TOC Replicate 3	**7.2**	mg/L	1.0	0.33	1	9/7/2018 18:05	MD	
TOC Replicate 4	**7.5**	mg/L	1.0	0.33	1	9/7/2018 18:05	MD	
Mean Total Organic Carbon	**7.2**	mg/L	1.0	0.33	1	9/7/2018 18:05	MD	

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ANALYTICAL RESULTS

Workorder: 27971 OCD / NP000588

Lab ID: **279710011** Date Received: 9/6/2018 08:30 Matrix: Water
Sample ID: **IW-16S** Date Collected: 9/5/2018 17:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A	Analytical Method: SW-846 9060A							
TOC Replicate 1	**86**	mg/L	5.0	1.6	5	9/7/2018 02:20	MD	d
TOC Replicate 2	**85**	mg/L	5.0	1.6	5	9/7/2018 02:20	MD	d
TOC Replicate 3	**89**	mg/L	5.0	1.6	5	9/7/2018 02:20	MD	d
TOC Replicate 4	**87**	mg/L	5.0	1.6	5	9/7/2018 02:20	MD	d
Mean Total Organic Carbon	**87**	mg/L	5.0	1.6	5	9/7/2018 02:20	MD	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 27971 OCD / NP000588

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

QC Batch: WET/2313 Analysis Method: SW-846 9060A

QC Batch Method: SW-846 9060A

Associated Lab Samples: 279710002, 279710003, 279710004, 279710005, 279710006, 279710008, 279710009, 279710011

METHOD BLANK: 57369

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

METHOD BLANK: 57409

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 57370

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	21	97	70-130	
TOC Replicate 2	mg/L	22	21	95	70-130	
TOC Replicate 3	mg/L	22	20	94	70-130	
TOC Replicate 4	mg/L	22	21	95	70-130	
Mean Total Organic Carbon	mg/L	22	21	95	70-130	

LABORATORY CONTROL SAMPLE: 57410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	23	103	70-130	

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

LABORATORY CONTROL SAMPLE: 57410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TOC Replicate 2	mg/L	22	23	105	70-130	
TOC Replicate 3	mg/L	22	23	104	70-130	
TOC Replicate 4	mg/L	22	23	105	70-130	
Mean Total Organic Carbon	mg/L	22	23	104	70-130	

MATRIX SPIKE SAMPLE: 57372 Original: 279710003

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	0.52	20	22	105	70-130	
TOC Replicate 2	mg/L	0.53	20	21	104	70-130	
TOC Replicate 3	mg/L	0.53	20	21	103	70-130	
TOC Replicate 4	mg/L	0.5	20	21	104	70-130	
Mean Total Organic Carbon	mg/L	0.52	20	21	104	70-130	

SAMPLE DUPLICATE: 57371 Original: 279710002

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	2.7	2.8	2.7	20	
TOC Replicate 2	mg/L	2.8	2.9	3.2	20	
TOC Replicate 3	mg/L	2.8	2.8	0.22	20	
TOC Replicate 4	mg/L	2.9	2.8	2.7	20	
Mean Total Organic Carbon	mg/L	2.8	2.8	0.82	20	

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

QC Batch: EACC/2742 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 279710001, 279710007

METHOD BLANK: 57384

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Sulfate	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 57385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Sulfate	mg/l	10	10	102	80-120	

MATRIX SPIKE SAMPLE: 57387 Original: 279710001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
EAcceptors							
Sulfate	mg/l	26	10	35	87	80-120	

SAMPLE DUPLICATE: 57386 Original: 279710001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
EAcceptors						
Sulfate	mg/l	26	26	0.69	20	

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

QC Batch: WET/2314 Analysis Method: SW-846 9060A
QC Batch Method: SW-846 9060A
Associated Lab Samples: 279710010

METHOD BLANK: 57388

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 57389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	22	102	70-130	
TOC Replicate 2	mg/L	22	22	99	70-130	
TOC Replicate 3	mg/L	22	21	97	70-130	
TOC Replicate 4	mg/L	22	21	97	70-130	
Mean Total Organic Carbon	mg/L	22	22	99	70-130	

MATRIX SPIKE SAMPLE: 57391 Original: 279710010

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	6.9	20	27	99	70-130	
TOC Replicate 2	mg/L	7.2	20	27	97	70-130	
TOC Replicate 3	mg/L	7.2	20	27	96	70-130	
TOC Replicate 4	mg/L	7.5	20	27	98	70-130	
Mean Total Organic Carbon	mg/L	7.2	20	27	98	70-130	

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

SAMPLE DUPLICATE: 57390 Original: 279710010

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	6.9	7.1	2.4	20	
TOC Replicate 2	mg/L	7.2	7.2	0.084	20	
TOC Replicate 3	mg/L	7.2	7.2	0.51	20	
TOC Replicate 4	mg/L	7.5	7.4	0.63	20	
Mean Total Organic Carbon	mg/L	7.2	7.2	0.28	20	

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

QC Batch: EACC/2743 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 279710006

METHOD BLANK: 57392

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Chloride	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 57393

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Chloride	mg/l	10	10	101	80-120	

MATRIX SPIKE SAMPLE: 57395 Original: 279710006

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
EAcceptors							
Chloride	mg/l	340	250	600	106	80-120	d

SAMPLE DUPLICATE: 57394 Original: 279710006

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
EAcceptors						
Chloride	mg/l	340	330	0.8	20	d

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QUALITY CONTROL DATA

Workorder: 27971 OCD / NP000588

QC Batch: DISG/7065 Analysis Method: AM20GAX
QC Batch Method: AM20GAX
Associated Lab Samples: 279710002, 279710004, 279710006

METHOD BLANK: 57465

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.50 U	0.50	n
Ethane	ug/l	0.10 U	0.10	n
Ethene	ug/l	0.10 U	0.10	n

LABORATORY CONTROL SAMPLE & LCSD: 57466 57467

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	750	660	730	88	98	80-120	10	20	n
Ethane	ug/l	38	39	41	102	108	80-120	5.5	20	n
Ethene	ug/l	35	36	38	103	109	80-120	5.3	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 27971 OCD / NP000588

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 27971 OCD / NP000588

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
279710002	MW-14R			SW-846 9060A	WET/2313
279710003	MW-29DR			SW-846 9060A	WET/2313
279710004	MW-34			SW-846 9060A	WET/2313
279710005	MW-34D			SW-846 9060A	WET/2313
279710006	MW-36			SW-846 9060A	WET/2313
279710008	IW-4S			SW-846 9060A	WET/2313
279710009	IW-5S			SW-846 9060A	WET/2313
279710011	IW-16S			SW-846 9060A	WET/2313
279710001	MW-10			SW-846 9056	EACC/2742
279710007	MW-39			SW-846 9056	EACC/2742
279710010	IW-8S			SW-846 9060A	WET/2314
279710006	MW-36			SW-846 9056	EACC/2743
279710002	MW-14R			AM20GAX	DISG/7065
279710004	MW-34			AM20GAX	DISG/7065
279710006	MW-36			AM20GAX	DISG/7065

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27971

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

012967

Section A Required Client Information:

Company: ARCADIS
Address: 10 Friends Lane
Newtown, PA 18940
Email To:
Phone: 978 322 4536 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Purvee Mittal
Copy To: purvee.mittal@arcadis-us.com
Purchase Order No.:
Project Name: OCD
Project Number: NP 000 588

Section C Invoice Information:

Attention: Accounts Payable
Company Name: ARCADIS
Address: 630 Plaza Dr. Suite 100
Pace Quote Reference: Highlands Ranch, CO
Pace Project Manager: 80129
Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER

Site Location STATE: NJ

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N)	TOC	Ethane, Ethene, Methane	Sulfate	Chloride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-10					9/5/18	11:15		2	2										X				
2	MW-14r						14:30		3	2	1								X	X				
3	MW-29Dr						16:15		1		1								X					
4	MW-34						12:15		3	2	1								X	X				
5	MW-34D						12:25		1		1								X					
6	MW-36						15:00		5	4	1								X	X		X		
7	MW-39						13:25		2	2											X			
8	IW-4s						16:30		1		1								X					
9	IW-5s						15:30		1		1								X					
10	IW-8s						17:00		1		1								X					
11	IW-16s						17:15		1		1								X					
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Steven B. Mell	9/5/18	18:30	[illegible] / PAS	9.6.18	0830	4.8	Y	N	

ORIGINAL

SAMPLER NAME AND SIGNATURE:
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: S2C2 **Project:** OCD1 NP000588 **Lab Work Order:** 27971

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ **Air bill Present:** Yes No

Tracking Number: 7826 4579 3340

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None **Ice Intact:** Yes Melted

Cooler Temperature: 4.8°C **Radiation Screened:** Yes No **Chain of Custody Present:** Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✗	✓		
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform	✓			If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?		✓		

Comments:_____

Cooler contents examined/received by : LJ **Date:** 9.6-18

Project Manager Review : JM **Date:** 9/6/18

NON-CONFORMANCE FORM

PAES Work Order #: 27971

Date: 8.6.18 Time of Receipt: 0830 Receiver: LG

Client: Arcadis / S2C2

REASON FOR NON-CONFORMANCE:

MW-14r: Vials / bottle ID was MW-14

ACTION TAKEN:

Client name: Date: Time:

client Emailed

Customer Service Initials: JW Date: 9.6.18

F-PAE-Q-014-rev.00, 20 Nov2014

pH SCREENING FORM

Client Arcadis

Client Project OCD/NP000588
PAES WO# 27971
Completed by LY
Date 9.6.2018
Page 1 of 1

No.	Sample	Preservative							pH	pH strip lot number
		HNO_3	H_2SO_4	HCl	None	BAK	NaOH	NaOH+ ZnAc		
1.	MW-14R		X						<2.0	HC421754
2.	MW-29DR		X						<2.0	"
3.	MW-34		X						<2.0	"
4.	MW-34D		X						<2.0	"
5.	MW-36		X						<2.0	"
6.	IW-4S		X						<2.0	"
7.	IW-5S		X						<2.0	"
8.	IW-8S		X						<2.0	"
9.	IW-16S		X						<2.0	HC421754

F-PAE-Q-010-rev.01, 26June2018

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Fax: (412) 826-3433

December 17, 2018

Purvee Mittal
Arcadis
One Executive Drive, Suite 303
Chelmsford, MA 01824

RE: **OCD / NP000588**
Pace Workorder: *28892*

Dear Purvee Mittal:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, December 05, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 12/17/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 16

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LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 28892 OCD / NP000588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
288920001	MW-36	Water	12/4/2018 14:25	12/5/2018 08:20
288920002	IMW-2	Water	12/4/2018 14:00	12/5/2018 08:20

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PROJECT SUMMARY

Workorder: 28892 OCD / NP000588

Workorder Comments

The container pH for samples 28892 (0001-0002) were measured as below the expected pH (< 10) for those samples preserved with trisodium phosphate, as assigned to PAES method AM20GAx.

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ANALYTICAL RESULTS

Workorder: 28892 OCD / NP000588

Lab ID: **288920001** Date Received: 12/5/2018 08:20 Matrix: Water
Sample ID: **MW-36** Date Collected: 12/4/2018 14:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EAcceptors - PAES								
Analysis Desc: SW-846 9056		Analytical Method: SW-846 9056						
Chloride	**350**	mg/l	10	4.1	10	12/11/2018 18:37	MD	d
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Methane	**15000**	ug/l	1.0	0.028	2	12/13/2018 07:12	BW	d,n
Ethane	**130**	ug/l	0.20	0.014	2	12/13/2018 07:12	BW	d,n
Ethene	**180**	ug/l	0.20	0.010	2	12/13/2018 07:12	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A		Analytical Method: SW-846 9060A						
TOC Replicate 1	**10**	mg/L	1.0	0.33	1	12/11/2018 22:22	MD	
TOC Replicate 2	**11**	mg/L	1.0	0.33	1	12/11/2018 22:22	MD	
TOC Replicate 3	**11**	mg/L	1.0	0.33	1	12/11/2018 22:22	MD	
TOC Replicate 4	**11**	mg/L	1.0	0.33	1	12/11/2018 22:22	MD	
Mean Total Organic Carbon	**11**	mg/L	1.0	0.33	1	12/11/2018 22:22	MD	

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ANALYTICAL RESULTS

Workorder: 28892 OCD / NP000588

Lab ID: **288920002** Date Received: 12/5/2018 08:20 Matrix: Water
Sample ID: **IMW-2** Date Collected: 12/4/2018 14:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**9700**	ug/l	1.0	0.028	2	12/13/2018 07:24	BW	d,n
Ethane	**0.50**	ug/l	0.20	0.014	2	12/13/2018 07:24	BW	d,n
Ethene	**0.096J**	ug/l	0.20	0.010	2	12/13/2018 07:24	BW	d,n
Wet Chemistry - PAES								
Analysis Desc: SW-846 9060A			Analytical Method: SW-846 9060A					
TOC Replicate 1	**2400**	mg/L	100	33	100	12/11/2018 23:28	MD	d
TOC Replicate 2	**2300**	mg/L	100	33	100	12/11/2018 23:28	MD	d
TOC Replicate 3	**2300**	mg/L	100	33	100	12/11/2018 23:28	MD	d
TOC Replicate 4	**2400**	mg/L	100	33	100	12/11/2018 23:28	MD	d
Mean Total Organic Carbon	**2400**	mg/L	100	33	100	12/11/2018 23:28	MD	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 28892 OCD / NP000588

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 28892 OCD / NP000588

QC Batch: DISG/7265 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 288920001, 288920002

METHOD BLANK: 58917

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.50 U	0.50	n
Ethane	ug/l	0.10 U	0.10	n
Ethene	ug/l	0.10 U	0.10	n

LABORATORY CONTROL SAMPLE & LCSD: 58918 58919

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	750	690	750	93	100	80-120	7.4	20	n
Ethane	ug/l	38	40	40	105	107	80-120	1.6	20	n
Ethene	ug/l	35	37	37	105	106	80-120	1.2	20	n

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QUALITY CONTROL DATA

Workorder: 28892 OCD / NP000588

QC Batch: WET/2317 Analysis Method: SW-846 9060A

QC Batch Method: SW-846 9060A

Associated Lab Samples: 288920001, 288920002

METHOD BLANK: 58937

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Wet Chemistry				
TOC Replicate 1	mg/L	1.0 U	1.0	
TOC Replicate 2	mg/L	1.0 U	1.0	
TOC Replicate 3	mg/L	1.0 U	1.0	
TOC Replicate 4	mg/L	1.0 U	1.0	
Mean Total Organic Carbon	mg/L	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 58938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	22	23	103	70-130	
TOC Replicate 2	mg/L	22	23	104	70-130	
TOC Replicate 3	mg/L	22	23	103	70-130	
TOC Replicate 4	mg/L	22	23	103	70-130	
Mean Total Organic Carbon	mg/L	22	23	103	70-130	

MATRIX SPIKE SAMPLE: 58940 Original: 288920002

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Wet Chemistry							
TOC Replicate 1	mg/L	2400	2000	4200	90	70-130	d
TOC Replicate 2	mg/L	2300	2000	4200	93	70-130	d
TOC Replicate 3	mg/L	2300	2000	4200	95	70-130	d
TOC Replicate 4	mg/L	2400	2000	4300	98	70-130	d
Mean Total Organic Carbon	mg/L	2400	2000	4200	94	70-130	d

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QUALITY CONTROL DATA

Workorder: 28892 OCD / NP000588

SAMPLE DUPLICATE: 58939 Original: 288920001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Wet Chemistry						
TOC Replicate 1	mg/L	11	11	1.8	20	
TOC Replicate 2	mg/L	11	11	0.082	20	
TOC Replicate 3	mg/L	11	11	1.2	20	
TOC Replicate 4	mg/L	11	11	0.76	20	
Mean Total Organic Carbon	mg/L	11	11	0.93	20	

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QUALITY CONTROL DATA

Workorder: 28892 OCD / NP000588

QC Batch: EACC/2784 Analysis Method: SW-846 9056
QC Batch Method: SW-846 9056
Associated Lab Samples: 288920001

METHOD BLANK: 58941

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EAcceptors				
Chloride	mg/l	1.0 U	1.0	

LABORATORY CONTROL SAMPLE: 58942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EAcceptors						
Chloride	mg/l	10	11	109	80-120	

MATRIX SPIKE SAMPLE: 58944 Original: 288920001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
EAcceptors							
Chloride	mg/l	350	100	460	105	80-120	d

SAMPLE DUPLICATE: 58943 Original: 288920001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
EAcceptors						
Chloride	mg/l	350	350	0.88	20	d

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 28892 OCD / NP000588

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 28892 OCD / NP000588

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
288920001	MW-36			AM20GAX	DISG/7265
288920002	IMW-2			AM20GAX	DISG/7265
288920001	MW-36			SW-846 9060A	WET/2317
288920002	IMW-2			SW-846 9060A	WET/2317
288920001	MW-36			SW-846 9056	EACC/2784

CERTIFICATE OF ANALYSIS
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www.pacelabs.com

220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

28892

Page: 1 of 1

013627

Section A Required Client Information:

Company:	ARCADIS
Address:	10 Friends Lane
	Newtown, PA 18940
Email To:	
Phone: 978 322 4536	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Purvee Mittal
~~Copy To:~~	purvee.mittal@arcadis-us.com
Purchase Order No.:	
Project Name:	OCD
Project Number:	NP 000 588

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	ARCADIS
Address:	630 Plaza Dr. Suite 100
Pace Quote Reference:	Highlands Ranch, CO
Pace Project Manager:	80129
Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: NJ

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N)	TOC	Ethene, Ethane, Methane	Chloride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-36	WT	G			12/4/18	14:25		5	4	1								X	X	X		
2	IMW-2	WT	G			12/4/18	14:00		3	2	1								X	X			
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Steven B. Gelb	12/4/18	17:55	Lesa PAS	12.5.18	0820	1.1	Y	N	

ORIGINAL

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Steven B. Gelb		
SIGNATURE of SAMPLER:	Steven B. Gelb	DATE Signed (MM/DD/YY):	12/4/18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: Arcadis **Project:** OCD **Lab Work Order:** 28892

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ **Air bill Present:** Yes No

Tracking Number: 784191215681

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None **Ice Intact:** Yes Melted

Cooler Temperature: 1.1°C **Radiation Screened:** Yes No **Chain of Custody Present:** Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC	✓			
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used				
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform	✓			If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?		✓		

Comments:_____

Cooler contents examined/received by : LY **Date:** 12.5.18

Project Manager Review : JW **Date:** 12.5.18

pH SCREENING FORM

Client Arcadis

Client Project OCD
PAES WO# 28892
Completed by LY
Date 12. 5. 2018
Page 1 of 1

No.	Sample	Preservative							pH	pH strip lot number
		HNO_3	H_2SO_4	HCl	None	BAK	NaOH	NaOH+ ZnAc		
1	MW-36		X					<2.0 →		HC421754
2	MW-2		X					<2.0 →		HC421754

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ARCADIS | Design & Consultancy for natural and built assets

Arcadis U.S., Inc.

10 Friends Lane

Suite 100

Newtown, Pennsylvania 18940

Tel 267 685 1800

Fax 267 685 1801

www.arcadis.com