Oregon
Kate Brown, Governor

Department of Environmental Quality
Western Region Eugene Office
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March 12, 2015

Jason Tokarski
Minto View, LLC
201 Ferry Street, Ste. 400
Salem, OR 97301

Re: Review of Findings and Supplemental Site Investigation Scope of Work
Pipe Investigation
Former Boise Cascade Upland Properties
Salem, OR
ECSI 4427

Dear Mr. Tokarski:

DEQ has reviewed the *Report of Findings and Supplemental Site Investigation Scope of Work*, prepared by Ktec Environmental Consulting, and dated February 20, 2015. Our observations, comments and recommendations on the report and proposed scope of work are presented herein.

Elevated dioxin concentrations have been detected on the slope in the vicinity of the Pipe. This slope is adjacent to Pringle Creek and currently has limited accessibility due to its steep slope and poor access. Eventually, the City of Salem would like to extend a walkway along Pringle Creek, from Pringle Creek Park, connecting it with the Park Parcel, Riverfront Park, and the proposed pedestrian bridge to Minto Island. Construction of the walkway would likely involve some engineering and excavation of soil under the adjacent railroad trestle and in the area where contamination has been detected.

Concentrations of dioxins in the slope above the ordinary/mean high water (OHW or MHW) mark exceed construction worker RBCs at one sample location. The construction worker RBC appears to be an appropriate screening level for future exposures to workers in this area, especially considering the future work planned by the city in the area. The concentrations of dioxins on the slope above the OHW mark also exceed terrestrial ecological screening levels[1], however currently it does not appear that there is much if any viable habitat for mammals or birds at that location.

Concentrations of dioxins in soil samples from below the OHW mark (samples Slope Area 3, and sample #15 from the Pringle Creek investigations) exceed DEQ's ecological screening level values (SLVs)[2]. The levels exceed hot spot concentrations when compared SLVs for fish and mammals. It is currently DEQ's policy to evaluate soils on waterway slopes below the OHW mark against aquatic ecological SLVs. The findings report did not discuss possible transport of contaminants down the slope into Pringle Creek. DEQ feels

[1]Oakridge National Laboratory (ORNL) Preliminary Remediation Goals for Ecological Endpoints
[2]Table A-1a, Sediment Bioaccumulation Screening Level Values (SLVs), DEQ *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment.*

that contaminant transport from the slope to the creek should be included as a contaminant migration pathway, and thus ecological receptors downstream could potentially be exposed to contaminants of concern.

Proposed Additional Site Investigation

DEQ agrees that assessment of the extent of contamination on the slope will require further investigation. The proposed approach in the findings report would help delineate the dioxin levels in the vicinity of sample point S2-C. However, given that the city has future plans to construct a walkway in this area, assessment beyond what is proposed in this report would likely be needed, for both chemical analytical, as well as geotechnical. Given this situation, DEQ would consider postponing further assessment, and even cleanup, in this area until plans are further developed for the walkway. It may be more cost effective to conduct additional sampling and cleanup as part of the walkway planning and implementation. We also realize there may be other reasons for conducting these activities separately.

Recommendations

The additional sampling approach proposed on the Pipe slope in the vicinity of sample S2-C is approved. This work may be done now or later, in conjunction with the walkway project. Similarly, soil removal on the slope, previously approved by DEQ, could wait to be done coincidentally with the walkway construction, if that is possible.

The soil migration pathway to Pringle Creek needs further investigation. DEQ will address this issue in a separate letter to Minto View LLC.

Please keep me appraised as to the schedule for any field work. If you have any questions about this letter, please call me at 541-687-7349. I can also be reached by email at hanson.don@deq.state.or.us.

Sincerely,

Donald Hanson, RG
Western Region Cleanup Program

ec: Patrick Rowe, Sussman Shank LLP,
Kathleen Thorpe, Ktec LLC,
Susan Turnblom, DEQ Toxicologist, Eugene

cc: ECSI File No. 4427 (COMM)

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February 20, 2015

Minto View LLC
Jason Tokarski
201 Ferry St. SE Suite 400
Salem, Or 97301

Re: Report of Findings and Supplemental Site Investigation
Scope of Work
Boise: Pipe
315 Commercial St SE
Salem, Oregon 97301

Dear Jason:

Attached, please find the Report of Findings and Supplemental Site Investigation Scope of Work for the Boise: Pipe site. This work was performed on behalf of Minto View LLC. If you have any questions or require further clarification of the report, please contact the undersigned at your convenience. Thank you for the opportunity to be of service to you.

Regards,

Kathleen J. Thorpe

Project Manager

ktec
ENVIRONMENTAL CONSULTING

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kathleen@cleanyourdirt.com

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salem, oregon 97301
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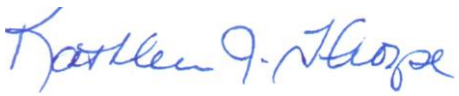
ccb# 173904

Report of Findings and Supplemental Site Investigation Scope of Work

Boise: Pipe
315 Commercial St SE
Salem, Oregon 97301

Prepared for
Minto View LLC
Jason Tokarski
201 Ferry St. SE Suite 400
Salem, Or 97301

Prepared by



Project Manager
Ktec, LLC

February 20, 2015

ENVIRONMENTAL CONSULTING

TABLE OF CONTENTS

Table of Figures
(Within the text)

Appendix
(Following the text)

1.0 Introduction

On behalf of Minto View, LLC, Ktec Environmental Consulting LLC (Ktec) investigated potential environmental impacts on a portion the former Boise Cascade Mill identified as Boise: Pipe (Site), located near 315 Commercial Street, SE, Salem, Oregon. In order to effectively prepare the Site for redevelopment, Minto View LLC requested characterization of the nature, extent, and potential risks associated with any residual contamination that may be in soil.

Figure 1, found on page 3, shows the general location of the Site. A more detailed map of the Site is shown on Figure 2, which is found on page 4.

This report includes a summary of background information for the Site, a description of the methods used by Ktec to sample soil, a summary of findings from the Ktec environmental soil investigation completed in September 29, 2014, and a scope of work for additional investigation.

2.0 Site Background

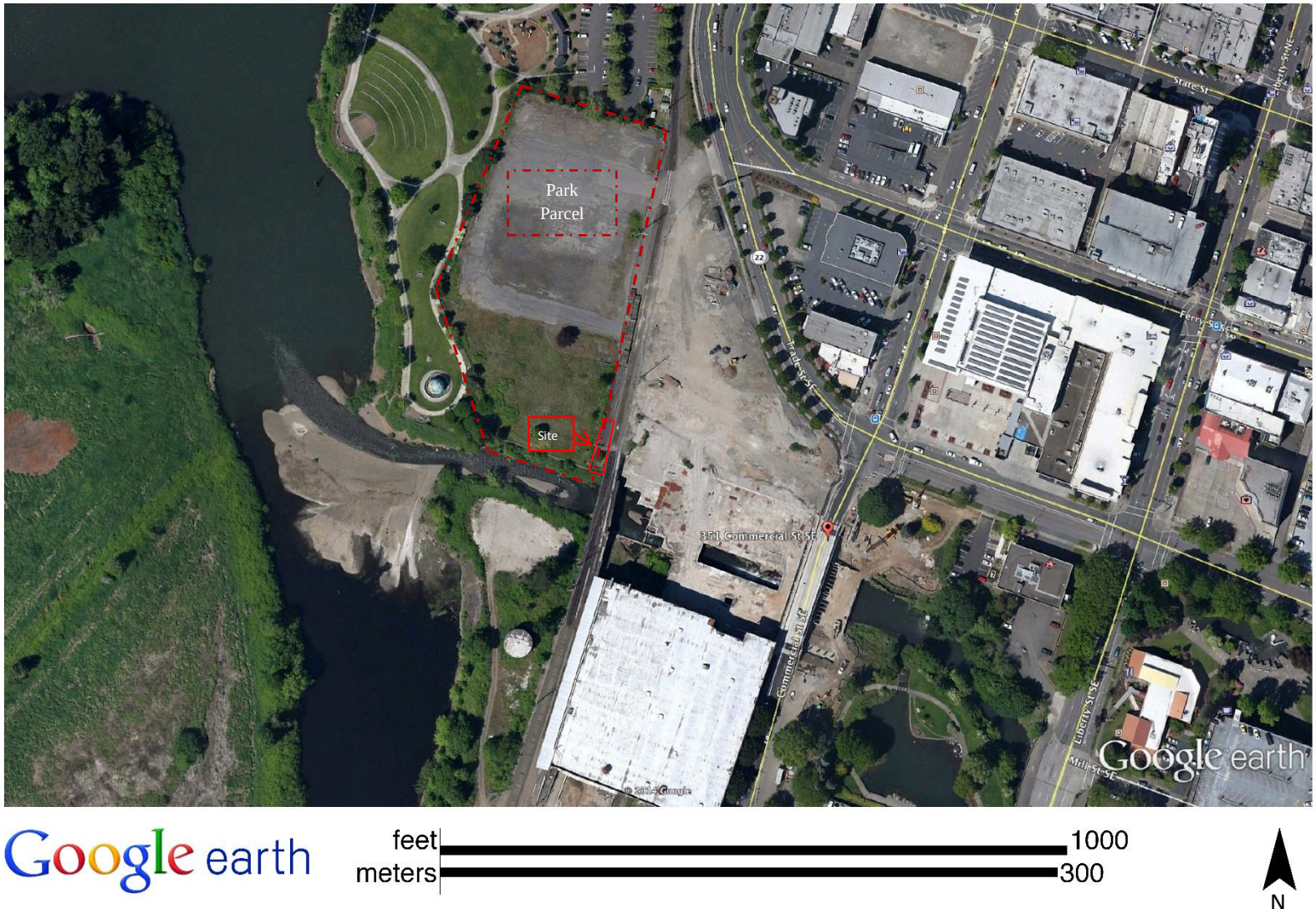
2.1. Site Description

The Site is located west of the railroad tracks and north of Pringle Creek, near the southwest corner of Trade and Commercial Streets in downtown Salem, Oregon. The Site is composed of a portion of tax lot 1700 and a portion of the Burlington Northern and Santa Fe Rail Road (BNSF) easement. The owner of tax lot 1700 portion of the property is Minto View North LLC. The Site is located in the city of Salem, Marion County, Oregon, Township 7 S, Range 3 W, and the NW ¼, Section 27 of the Willamette Meridian.

The Site is part of the much larger Park Parcel (tax lot 1700, also depicted on Fig. 1). The Site also includes a portion of the BNSF easement which lies to the east of the Park Parcel. Pringle Creek is located directly south of the Site. The Site consists of a steep slope above the bank of Pringle Creek and also includes a portion of upland that contains the "pipe": The slope portion of the Site is approximately 30-feet by 50-feet, of which the Park Parcel portion is approximately 6 x 50. This area of the Site is primarily covered with riprap rock. The upland portion of the site is approximately 30-feet by 40 feet, was covered with asphalt and is located directly north of the slope (Figure 2).

Properties in the general vicinity of the Site are comprised primarily of commercial and public park uses, and residential multi-family dwelling areas are nearby.

Figure 1 - Site Location Map



2.2. Site History

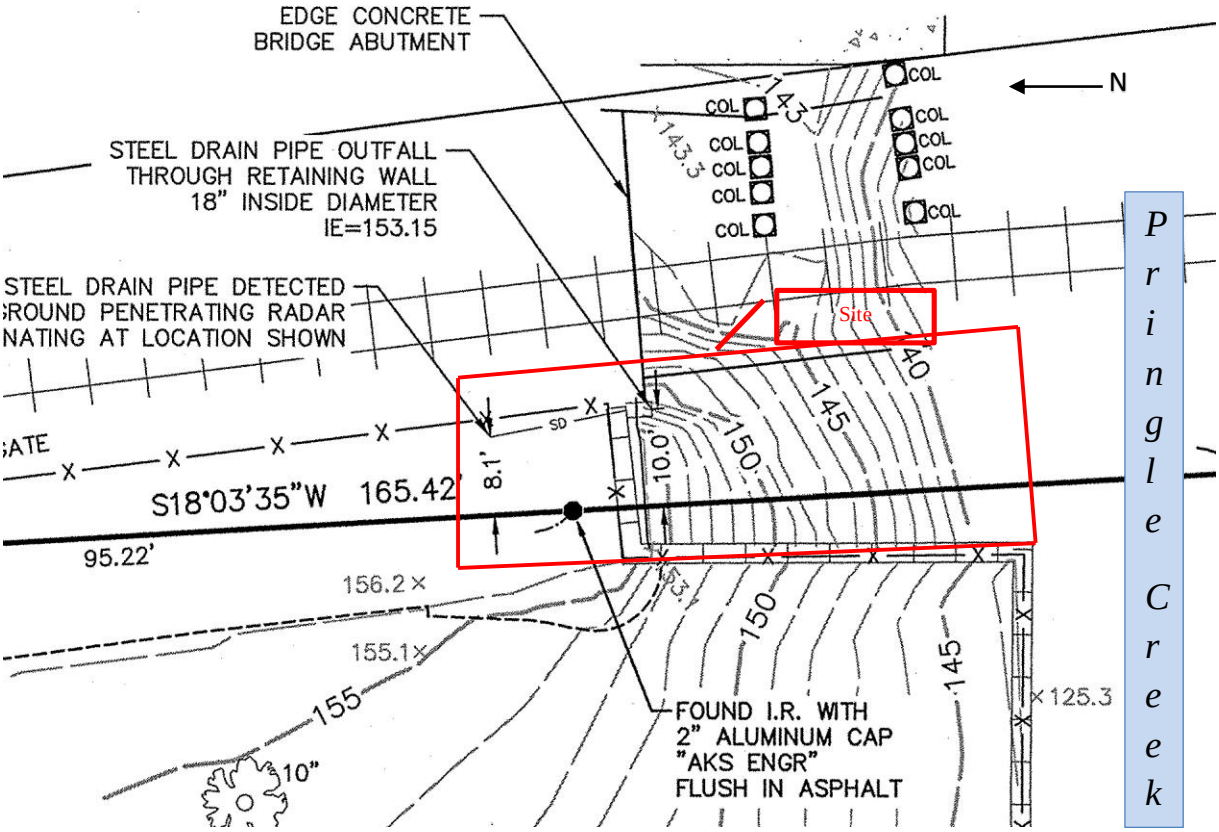
The Boise property was originally developed in the late 1800s as a flourmill. In the 1950s, Columbia River Paper Company operated a lumber mill and a pulp and paper plant and Boise Cascade purchased the facilities in 1962. In the early 1980s, the facility, pulping, bleaching and chemical recovery operations located on the Park Parcel were shut down by Boise.

The use of the Site was historically tied into the larger uses of the Park Parcel. Sanborn Fire Insurance Maps were reviewed in an effort to further identify potential uses of the Site and an associated 18", 20-foot long steel Pipe. The map review was focused on the Site and the Pipe, however, the Pipe was not identified on any of the Sanborn maps (Environmental Data Resources Inc, 2007).

The "Pipe" was identified on the Site in 2011 by AMEC during a Phase I Environmental Site Assessment for the City of Salem. Initially, the pipe was suspected of being an outfall, but further investigation, and information from Boise, indicated that it was most likely a pipe for moving either water or pulp.

Figure 2, found on page 4 is a Site Layout Map. The Site today is undeveloped (see Section 2.1 Site Description).

Figure 2 - Site Layout Map



2.3. Previous Dioxin Sampling

Soil samples were collected on four separate occasions between 2011 and 2012 in preparation for either development or sale of the Park Parcel. Soil samples were submitted to Pace Analytical in Minneapolis, MN to analyze for the presence or absence of polychlorodibenzo-p-dioxins (PCDD) and polychlorodibenzofurans (PCDFs) by a modified version of USEPA Method 8290 (dioxin analysis) or EPA method 1613B. Only the samples relating specifically to the Site are summarized below.

Laboratory results were adjusted using the Toxic Equivalency Factor (TEF) methodology (WHO, 2005), a component mixture method, for evaluation of human health and ecological risks.

The results of analysis are summarized in Table 1 Dioxins in Soil Slope Samples, found in Appendix 1, Figure 3; the Dioxin Sample Location Map is found on Page 6.

Appendix 1 Analytical Tables

2.3.1. Dioxin Sampling March 2011

In March 2011, Ktec mobilized to the Park Parcel and collected one soil sample from directly below the Pipe opening (soil sample B23-6”-1’). That sample was sent to Pace Analytical in MN for dioxin analysis.

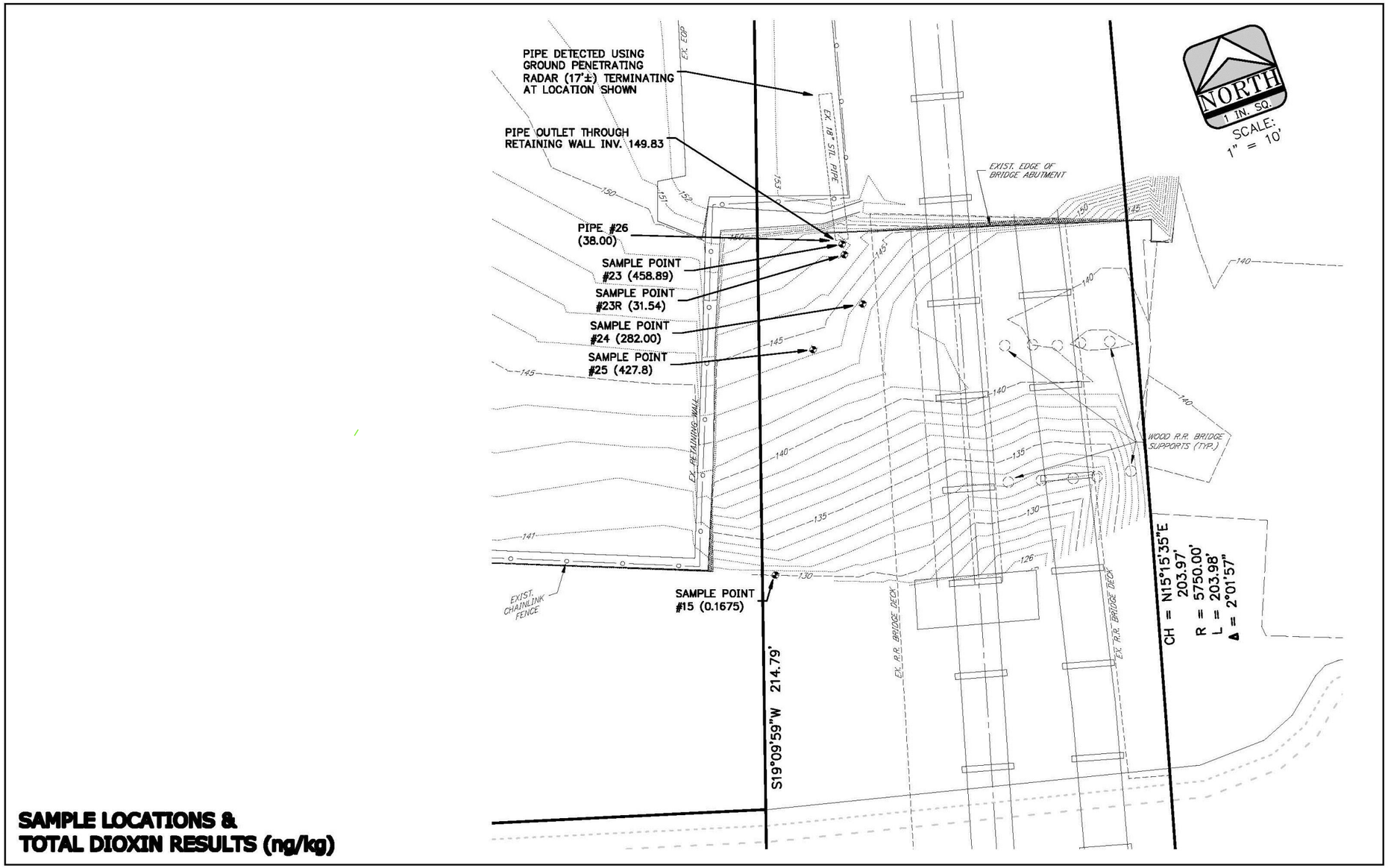
2.3.2. Dioxin Sampling November 2011

In November 2011, three additional soil samples were collected from the slope beneath the Pipe, B23-replicate, B24 and B25. These samples were the target of that sampling event and were taken in an effort to confirm the B23-6”-1’ sample results, and delineate an apparent release of dioxin to the soil in this area.

2.3.3. Dioxin Sampling December 2011

In December 2011, one additional sample, B26-Outfall Pipe was collected from soil inside the 18”-diameter steel Pipe.

Figure 3 Dioxin Sample Location Map



3.0 Supplemental Site Investigation Methods

Anticipated future development of the Site is for a park accessible sidewalk. Supplemental soil sampling at the Site was performed by Ktec, LLC, in September 2014. This sampling event was coordinated with the City of Salem (the Prospective Purchaser of the Site) and the DEQ and was informally known as Plan B. The purpose of Plan B was to facilitate the sale and development of the Park Parcel by further characterizing the nature and extent of dioxins in soil. Sampling and analytical methods used in this investigation are described below.

Four areas were targeted for sampling.

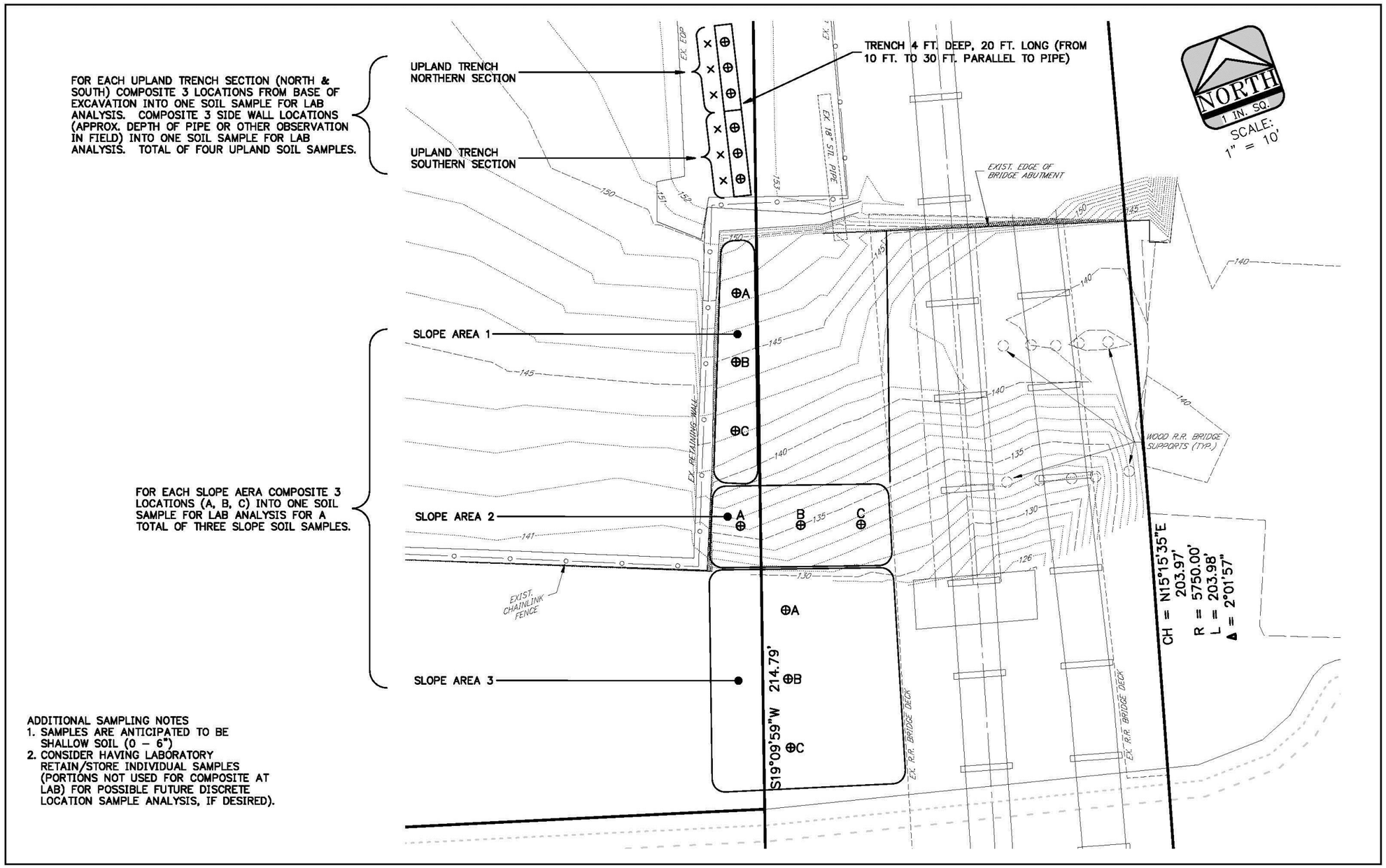
- A trench was progressed on the upland portion of the Park Parcel, west of the BNSF railroad, parallel and to the west of the "pipe." The trench was approximately 20-feet long and about four-feet deep, and situated so that the northern portion of the trench extended about ten-feet north of the pipe, and the southern portion of the trench extended to the south, and parallel to the pipe.
    - Six discrete soil samples were collected from the bottom of the north and south ends of the trench and six discrete soil samples were collected from the sidewall of the trench, about two-foot bgs.
- The slope area was divided into three sections, Slope Area 1, Slope Area 2 and Slope Area 3.
    - Three discrete samples locations were identified within each of the sections for sample collection.
    - Nine-discrete samples were collected between 0 and 6" below ground surface (bgs).
- Twenty-one total discrete samples were sent to Pace Analytical in Minneapolis, MN for compositing and analysis. Discrete samples were retained for further analysis if desired.

Figure 4 Sample Location Map, found on page 8.

3.1. Analytical Methods

Samples were submitted to Pace Analytical for dioxin and furan analysis by EPA method 1613B. All laboratory reports and chain-of-custody documentation associated with the sampling performed during this investigation are attached.
Appendix 2 – Pace Analytical Laboratory Reports

Figure 4 – Sample Location Map



3.2. Sampling Methods

The methods and procedures used during the field activities are described in the following sections. A mini-excavator was used to facilitate sample collection from the trench.

3.2.1. Soil Sample Collection Methods

Sample points on the slope were collected by hand. Samples from the upland locations were collected from the bucket of the mini-excavator. The sample jars were filled completely to avoid off-gassing of any volatile organic material that may be present.

Sample information was written on the labels or jar lids using waterproof, non-erasable ink. Sample labels used in sample identification indicate the sample location number and location within a sample set from which each sample was retrieved. For example, soil sample TNB-A, was from the trench north end bottom and was from the northern end of the section. Sample TNS – A was from the trench, north end, sidewall and was also from the northern end of the sample section. Sample S1-A came from sample section Slope 1 and was the most northerly sample in that section.

Samples were placed in appropriate sample containers, labeled, and properly sealed. Real ice was used to cushion sample containers. The samples were then placed into coolers with ice and transported, under chain-of-custody procedures, to Pace Analytical Laboratories in Minneapolis, Minnesota for analysis.

3.3. Abandonment of Sample Locations

Each sample location was backfilled immediately following sample collection with the remaining excavation material with the intention of removing any negatively-impacted soil in the near future in coordination with the DEQ approved, September 9, 2014 Interim Removal Action Measures Work Plan.

3.4. Decontamination and Managing Wastes

General refuse was collected in plastic bags, removed from the Site, and disposed in an appropriate method.

4.0 Soil Sample Results

Results for the soil samples are described below. Refer to table 2 Pipe – Plan B, Appendix 1.

4.1. Dioxins

Twenty-one discrete soil samples were submitted for laboratory compositing into seven dioxin samples for analysis. Of the seven samples analyzed, five samples exceeded the direct contact RBCs for the urban residential and occupational worker. One sample S2-ABC exceeded the construction and excavation worker RBC. The discrete samples collected for sample S2-ABC were then analyzed. Samples S2-A and S2-B exceeded the direct contact RBCs for the urban residential and occupational worker and Sample S2-C (2,102.13 ppt) exceeded all direct contact pathways, and DEQ ecological screening level values for mammalian and bird populations. Total 2,3,7,8-TCDD toxicity equivalents in the remaining surface soil samples were below all potentially applicable DEQ RBCs.

5.0 Conceptual Site Model

The conceptual Site model (CSM) summarizes known or suspected sources of contamination, fate and transport processes that affect the distribution of contamination, and mechanisms by which human and ecological receptors may contact impacted environmental media.

Four elements are required to establish a complete exposure pathway: 1) a source and mechanism of chemical release to the environment, 2) an environmental transport medium for a released chemical, 3) a point of potential contact with the impacted medium (referred to as the exposure point), and 4) an exposure route (e.g., soil ingestion) at the exposure point. The DEQ has developed several generic exposure pathways that are commonly evaluated at contaminated Sites (DEQ, 2003). The exposure scenarios that are relevant for the property are discussed below.

5.1. Exposure Scenarios

The Site is currently vacant; however Site development as a potential pedestrian walkway into the Riverfront Park is the main option being considered for the foreseeable future. Given the considered future use, park visitors, occupational workers or other various workers have the greatest potential to have direct or indirect exposure to impacted soil. DEQ has determined that the project will use the most conservative RBC, the Urban Residential and Occupational Direct Contact for evaluating risk. Potential exposure scenarios are briefly discussed below for soil.

5.2. Potential Human Health Exposure Scenarios

The City's development plans include a walkway along Pringle Creek in the vicinity of the Site and slope area. Based on the City of Salem intent to develop the parcel as a park, the population most likely to have potential contact with soil in the area would be future park recreationists and potentially park maintenance personnel.

5.2.1. Soil

It is assumed that park recreationists and potentially park maintenance personnel could have long-term direct-contact exposure to surface soil (0 to 3 feet bgs). Direct-contact exposure routes include incidental soil ingestion, inhalation of particulates, and dermal contact.

It is assumed that construction and excavation workers may contact chemicals in subsurface soil (i.e., 0 to 15 feet bgs) through incidental soil ingestion, inhalation of particulates, and dermal contact.

Dioxins are not considered volatile chemicals (DEQ, 2003). As a result, vapor migration from soil to indoor or outdoor air is considered insignificant for these chemicals.

6.0 Screening-level Human Health Risk Evaluation

Consistent with the risk evaluation framework outlined in DEQ guidance (DEQ, 2003), human health risk estimates were made by comparing concentrations of chemicals in soil with the selected DEQ RBCs.

An RBC is an estimate of the concentration of a chemical in the exposure unit that would not pose unacceptable risks to human receptors with a reasonable maximum exposure to impacted soil. If the concentration of a chemical in soil is below an applicable RBC, it is inferred that exposure to the chemical will not result in unacceptable human health risks. Alternatively, if concentrations of a chemical are greater than an applicable RBC, further evaluation of potential health risks may be warranted.

Table 1 in appendix 2 present concentration data and potentially applicable screening levels for contaminants of potential concern (COPCs). Sample locations and analytical results are shown on Figure 5 found on page 13.

6.1. Soil

DEQ RBCs (DEQ, 2010) that are protective of urban residents, occupational workers, and construction workers were available for comparison with the dioxin detected in soil.

6.1.1. Dioxins

The method used by DEQ to evaluate dioxins and furans recognizes that dioxin-like substances have a common mode of action, and the toxicity of mixtures of these types of chemicals are estimated by summing the relative toxicities of various congeners in the mixture (Van den Berg et al., 2006). Dioxin/furan TEFs are used to relate the toxicity of a particular dioxin or furan to

the most toxic congener which is 2,3,7,8-tetrachloro dibenzo-p-dioxin (2,3,7,8-TCDD). Total 2,3,7,8-TCDD toxicity equivalents were calculated by multiplying the concentration of a dioxin/furan to the TEF, and then summing the toxicity equivalent concentrations (TECs) for all detected dioxins/furans (Table 1).

Of the seven composite samples analyzed, five samples exceeded the urban residential direct contact RBC and occupational worker direct contact RBC. One sample, S2-ABC, exceeded the construction and excavation worker RBC. The discrete samples collected for compositing into S2-ABC were then analyzed. Samples S2-A and S2-B exceeded the direct contact RBCs for the urban residential and occupational worker. Sample S2-C (2,102.13 ppt) exceeded all direct contact pathways, and DEQ ecological screening level values for mammalian and bird populations. Total 2,3,7,8-TCDD toxicity equivalents in the remaining surface soil samples were below all potentially applicable DEQ RBCs.

6.2. Human Health Risk Summary

The concentrations of some dioxin chemicals in surface soil (0 to 3 feet bgs) were above applicable DEQ RBCs and DEQ Ecological SLVs.

- Concentrations of dioxin in composite samples TSB-ABC, TSS – ABC, S1-ABC, S2-ABC, S3- ABC and discrete samples S2-A, S2-B and S2-C exceeded the direct contact RBC for the urban resident, and occupational pathway.
- Concentrations of dioxin in composite sample S2-ABC and discrete sample S2-C exceeded the direct contact RBC for the urban resident, occupational and construction worker pathway, and the DEQ Ecological Screening Level Values (SLVs) for mammal and bird populations.

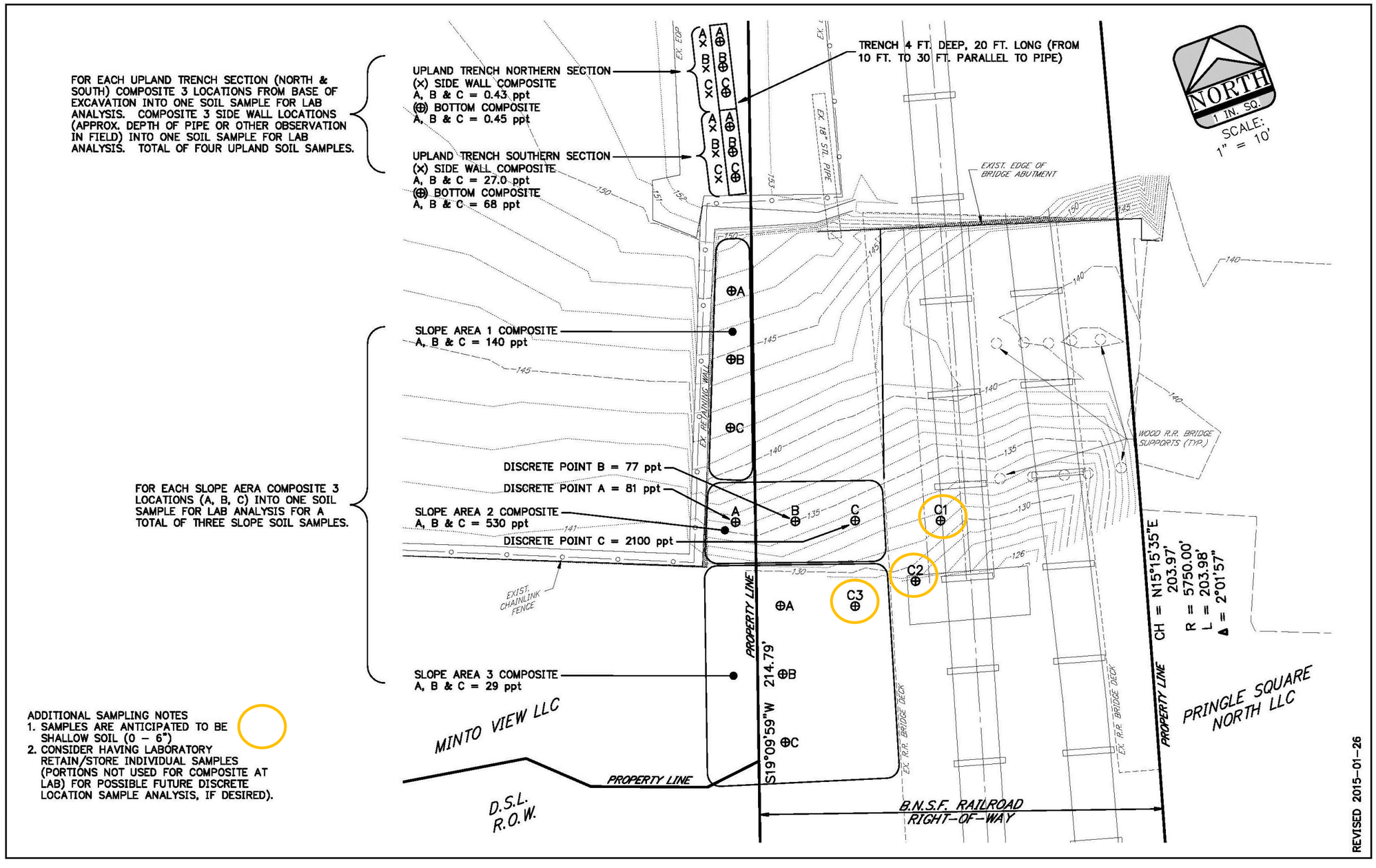
7.0 Proposed Additional Site Investigation

Based on discussions with DEQ, three additional discrete samples are being recommended to further delineate potential dioxin contamination associated with sample point S2-C.

- Sample Point S2C-C1 would be located approximately 10-feet east of sample point S2-C.
- Sample Point S2C-C2 would be located approximately 10-feet south east of sample point S2-C.
- Sample Point S2C-C3 would be located approximately 10-feet south of sample point S2-C.

The analytical data received from these additional sample points may be used in revising the Interim Removal Action Measures Work Plan dated September 9, 2014. These additional sample points are shown on Figure 5 on page 13.

Figure 5 – Supplemental Sample Locations



8.0 Limitations and Exceptions

This report has been prepared for the exclusive use of the client, "Minto View LLC", with specific application to the Site located at **315 Commercial St SE, in Salem, Oregon, known commonly as Pipe**. The use of this report, its contents, or any part of it by a party, or its agents, other than the ones for whom this report was prepared, is herewith disallowed.

In part, these findings, conclusions and recommendations are based on the best available information known or made available at the time of the assessment by Minto View LLC, regulators, other consultants, or other sources. Over time, **the surficial evidence of some activities has been obscured or obliterated entirely**. It is possible that certain adverse conditions could exist at the Site, which were not detected in this assessment.

The services provided under this contract as described in this report include professional opinions and judgments based on data collected. These services have been provided according to generally accepted practices. The opinions and conclusions contained in this report are typically based on information obtained from:

1. Prior Site investigations
2. Observations and measurements made by our field staff.
3. Discussions with regulatory agencies and others.
4. Review of available hazardous substance or solid waste lists.
5. Opinions and judgments of Ktec LLC based on the information available.

In the professional judgment of Ktec LLC, the services performed pursuant to the Scope of Services are an adequate basis to collect data for an evaluation of the Site and upon which to draw the conclusions stated in this Supplemental Site Investigation Report.

9.0 REFERENCES

The following documents, maps, or other publications may have been used in the preparation of this report:

AMEC. 2004. *Phase I Environmental Site Investigation, Boise Cascade Corporation- Salem Converting Plant.* July.
CH2MHill. 2005. *Phase 2 Site Investigation Report, Boise Cascade Mill,* and dated May 2005

CH2MHill. 2007. Independent cleanup pathway final report for the Boise Cascade Mill – Salem, Oregon, ECSI No. 4427. February.

DEQ. 2002. Memo (re: default background concentrations for metals) to cleanup project managers from toxicology workgroup. Oregon Department of Environmental Quality. October 28.

DEQ. 2003. Risk-based decision making for the remediation of petroleum contaminated Sites. Oregon Department of Environmental Quality. September 22. Risk-based concentrations updated December 11, 2006.

DEQ. 2007. Documentation Supporting No Further Action Determination Independent Cleanup Pathway Oregon Department of Environmental Quality. April

DEQ. 2007. No Further Action Required ECSI 4427. June

DEQ. 2010. Risk-based concentrations for individual chemicals calculation workbook. March.

Environmental Data Resources Inc. (2007). *Certified Sanborn Map report.* Milford: Environmental Data

Van den Berg et al. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 2006 93(2):223-241.

United States Department of Agriculture, Soil Conservation Service, Soil Surveys.

APPENDIX 1

Pace Analytical Reports

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Kathleen Thorpe
Ktec, LLC
5583 Basil Street NE
Salem OR 97317

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Information:

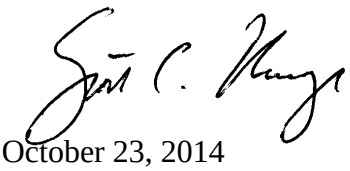
Pace Project #: 10283720
Sample Receipt Date: 10/01/2014
Client Project #: Boise Pipe (B)
Client Sub PO #: N/A
State Cert #: MN200001-005

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



October 23, 2014

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com

Report Prepared Date:
October 23, 2014

ACCREDITED IN ACCORDANCE WITH nelac

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on seven samples submitted by a representative of Ktec, LLC. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using USEPA Method 1613B. Sample preparation utilized microwave assisted extraction followed by the method specified cleanup procedures. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 24-85%. Except for one low value, which was flagged "R" on the results table, the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

In some cases, interfering substances impacted the determinations of PCDD or PCDF congeners; the affected values were flagged "I" where incorrect isotope ratios were obtained or "P" where polychlorinated diphenyl ethers were present. Concentrations below the calibration range were flagged "J" and should be regarded as estimates. Concentrations above the calibration range were flagged "E" and should also be regarded as estimates. Values obtained from the analysis of a diluted extract were flagged "D" and "N2".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of PCDDs and PCDFs at the reporting limits. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field samples.

Laboratory and matrix spike samples were also prepared with the sample batch using clean sand or sample matrix that had been fortified with native standard materials. The results show that the spiked native compounds were generally recovered at 84-130% with relative percent differences (RPDs) of 0.2-30.1%. The background-subtracted recoveries obtained for HpCDD and OCDD in the matrix spike and/or matrix spike duplicate were above the 70-130% target range. Also, the RPD values obtained for HpCDD and OCDD were above the 20% target upper limit. These deviations may be due to sample inhomogeneity.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	92
Alaska	MN00064	Nebraska	
Arizona	AZ0014	Nevada	MN_00064_200
Arkansas	88-0680	New Jersey (NE	MN002
California	01155CA	New York (NEL	11647
Colorado	MN00064	North Carolina	27700
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-Q	Ohio	4150
Florida (NELAP	E87605	Oklahoma	D9922
Georgia (DNR)	959	Oregon (ELAP)	MN200001-005
Guam	959	Oregon (OREL	MN300001-001
Hawaii	SLD	Pennsylvania	68-00563
Idaho	MN00064	Puerto Rico	MN00064
Illinois	200012	Saipan	MP0003
Indiana	C-MN-01	South Carolina	74003001
Indiana	C-MN-01	Tennessee	TN02818
Iowa	368	Texas	T104704192-08
Kansas	E-10167	Utah (NELAP)	MN00064
Kentucky	90062	Virginia	00251
Louisiana	03086	Washington	C755
Maine	2007029	West Virginia	9952C
Maryland	322	Wisconsin	999407970
Michigan	9909	Wyoming	8TMS-Q
Minnesota	027-053-137		

REPORT OF LABORATORY ANALYSIS

Appendix A

Sample Management

Report No....10283720_1613B

Page 5 of 21

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

10283720 and 10283721

Page: 1 of 2

1711886

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Ktec LLC	Report To: Kathleen Thorpe	Attention: Kathleen Thorpe
Address: 5583 Basil St NE Salem OR 97317	Copy To:	Company Name: Ktec LLC
Email To: kathleen@cleanyourdirt.com	Purchase Order No.:	Address: 5583 Basil St NE Slm
Phone: 5035894311 Fax:	Project Name: Boise Pipe (JB)	Pace Quote Reference:
Requested Due Date/TAT: Normal TAT	Project Number:	Pace Project Manager: Scott Unze
		Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: OR

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	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: 1613B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	TNB-A	SC	G	9/29	10:45															Please retain the dessecate samples for possible additional analysis
2	B (Composite)				10:40													X		
3	C				10:30															
4	TNS-A				10:50															
5	B (Composite)				10:55													Y		
6	C				11:06															
7	TSB-A				10:20															
8	B (Composite)				10:15													Y		
9	C				10:10															
10	TSS A				11:05															
11	B (Composite)				11:10													X		
12	C			9/30	11:30															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				PACE	10-1-14	940	4.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kathleen J. Thorpe

SIGNATURE of SAMPLER: Kathleen J. Thorpe DATE Signed (MM/DD/YY): 9/30/14

ORIGINAL

Comp 10/1/14 @ 7:00 KW

*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.

Report No....10283720_1613B

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

1237519

Section A Required Client Information:

Company:	Ktec LLC
Address:	5583 Basil St NE Salem OR 97317
Email To:	Kathleen@cleanyardirt.com
Phone:	503 5894311
Fax:	
Requested Due Date/TAT:	normal

Section B Required Project Information:

Report To:	Kathleen Thorpe
Copy To:	
Purchase Order No.:	
Project Name:	Boise: Pipe (B)
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: OR

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	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test ↓	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S1-A	SL	G	9/29/14	8:45														1613a		
2	B composite				8:30														X		
3	C				8:40																
4	S2-A				8:10																
5	B composite				8:20														X		
6	C				8:25																
7	S3-A				9:20																
8	B composite				9:30														X		
9	C				9:40																
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				PACE	10-1-14	940	4.5	Y	N	Y

ORIGINAL

Comp 10/1/14 KH @17:50

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kathleen J. Thorpe

SIGNATURE of SAMPLER: Kathleen J. Thorpe DATE Signed (MM/DD/YY): 9/29/14

*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-May-2007

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 28Feb2014 Page 1 of 1
	Document No.: F-MN-L-213-rev.09	Issuing Authority:

WO#:10283720

10283720

WO#:10283721

10283721

Sample Condition Upon Receipt

Client Name: Ktec LLC **Project #:**

Courier: ☒Fed Ex ☐UPS ☐USPS ☐Client ☐Commercial ☐Pace ☐SpeeDee ☐Other:_____

Tracking Number: 7713 1808 3800

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒N

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank:** ☐Yes ☒No

Thermom. Used: ☐B88A9130516413 ☐B88A912167504 ☒B88A9132521491 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.3 **Cooler Temp Corrected (°C):** 4.8 **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.5 **Date and Initials of Person Examining Contents:** 10-1-14 AA

				Comments:
Chain of Custody Present?	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☐Yes	☒No	☐N/A	3.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☒No	☐N/A	7.
Sufficient Volume?	☒Yes	☐No	☐N/A	8.
Correct Containers Used?	☒Yes	☐No	☐N/A	9.
-Pace Containers Used?	☒Yes	☐No	☐N/A	
Containers Intact?	☒Yes	☐No	☐N/A	10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	11.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL	☒Yes	☐No	☐N/A	12. Sample containers labeled on caps
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	13. ☐HNO_3 ☐H_2SO_4 ☐NaOH ☐HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐Yes	☐No	☒N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☐Yes	☒No		Initial when completed:_____ Lot # of added preservative:_____
Headspace in VOA Vials (>6mm)?	☐Yes	☐No	☒N/A	14.
Trip Blank Present?	☐Yes	☐No	☒N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/7/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion

Appendix B

Sample Analysis Summary

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	TnB - A,B,C Composite		
Lab Sample ID	10283720001		
Filename	U141023B_05		
Injected By	SMT		
Total Amount Extracted	10.7 g	Matrix	Solid
% Moisture	17.6	Dilution	NA
Dry Weight Extracted	8.82 g	Collected	09/29/2014 10:45
ICAL ID	U141013	Received	10/01/2014 09:40
CCal Filename(s)	U141023B_01	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/23/2014 11:47

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.3	-----	1.0	2,3,7,8-TCDF-13C	2.00	34
Total TCDF	5.0	-----	1.0	2,3,7,8-TCDD-13C	2.00	41
				1,2,3,7,8-PeCDF-13C	2.00	34
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	33
Total TCDD	2.1	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	38
				1,2,3,4,7,8-HxCDF-13C	2.00	35
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	34
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	34
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	34
				1,2,3,4,7,8-HxCDD-13C	2.00	35
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	34
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	31
				1,2,3,4,7,8,9-HpCDF-13C	2.00	30
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	36
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	24
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	6.1	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.45 ng/Kg		
Total HpCDF	ND	-----	5.0	(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	27.0	-----	5.0			
Total HpCDD	95.0	-----	5.0			
OCDF	ND	-----	10.0			
OCDD	160.0	-----	10.0			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	TnS - A,B,C Composite		
Lab Sample ID	10283720002		
Filename	F141022B_16		
Injected By	BAL		
Total Amount Extracted	10.3 g	Matrix	Solid
% Moisture	18.9	Dilution	NA
Dry Weight Extracted	8.35 g	Collected	09/29/2014 11:00
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141022B_08	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/22/2014 20:35

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	1.5	-----	1.0	2,3,7,8-TCDD-13C	2.00	77
				1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	80
				1,2,3,4,7,8-HxCDF-13C	2.00	62
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	63
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	67
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	60
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	93
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.43 ng/Kg		
Total HpCDF	ND	-----	5.0	(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	34.0	-----	5.0			
Total HpCDD	64.0	-----	5.0			
OCDF	ND	-----	10.0			
OCDD	310.0	-----	10.0			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	TSB - A,B,C Composite		
Lab Sample ID	10283720003		
Filename	F141022B_17		
Injected By	BAL		
Total Amount Extracted	10.6 g	Matrix	Solid
% Moisture	12.6	Dilution	NA
Dry Weight Extracted	9.26 g	Collected	09/29/2014 10:20
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141022B_08	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/22/2014 21:18

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	490.0	-----	1.0		2,3,7,8-TCDF-13C	2.00	64
Total TCDF	1200.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	-----	1.0	1.0	IJ	2,3,4,7,8-PeCDF-13C	2.00	65
Total TCDD	13.0	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	74
					1,2,3,4,7,8-HxCDF-13C	2.00	59
1,2,3,7,8-PeCDF	-----	46.0	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	60
2,3,4,7,8-PeCDF	36.0	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	62
Total PeCDF	88.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	61
					1,2,3,4,7,8-HxCDD-13C	2.00	62
1,2,3,7,8-PeCDD	ND	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	57
Total PeCDD	7.0	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	59
					1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,7,8-HxCDF	21.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	69
1,2,3,6,7,8-HxCDF	ND	-----	5.0		OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	ND	-----	5.0				
1,2,3,7,8,9-HxCDF	ND	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	48.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	13.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	5.5	-----	5.0				
1,2,3,7,8,9-HxCDD	ND	-----	5.0				
Total HxCDD	60.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	26.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0		Equivalence: 68 ng/Kg		
Total HpCDF	73.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	79.0	-----	5.0				
Total HpCDD	260.0	-----	5.0				
OCDF	98.0	-----	10.0				
OCDD	910.0	-----	10.0				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
P = PCDE Interference
I = Interference present

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	TSS - A,B,C Composite		
Lab Sample ID	10283720004		
Filename	F141022B_18		
Injected By	BAL		
Total Amount Extracted	10.5 g	Matrix	Solid
% Moisture	17.4	Dilution	NA
Dry Weight Extracted	8.67 g	Collected	09/29/2014 11:10
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141022B_08	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/22/2014 22:02

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	120.0	-----	1.0		2,3,7,8-TCDF-13C	2.00	55
Total TCDF	230.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	58
2,3,7,8-TCDD	ND	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	57
Total TCDD	4.2	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	65
					1,2,3,4,7,8-HxCDF-13C	2.00	51
1,2,3,7,8-PeCDF	-----	13	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	53
2,3,4,7,8-PeCDF	9.9	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	53
Total PeCDF	32.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	52
					1,2,3,4,7,8-HxCDD-13C	2.00	51
1,2,3,7,8-PeCDD	ND	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	54
Total PeCDD	ND	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	50
					1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	6.6	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	60
1,2,3,6,7,8-HxCDF	ND	-----	5.0		OCDD-13C	4.00	47
2,3,4,6,7,8-HxCDF	ND	-----	5.0				
1,2,3,7,8,9-HxCDF	ND	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	91.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	6.8	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	21.0	-----	5.0				
1,2,3,7,8,9-HxCDD	12.0	-----	5.0				
Total HxCDD	110.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	58.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0		Equivalence: 27 ng/Kg		
Total HpCDF	220.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	530.0	-----	5.0				
Total HpCDD	1000.0	-----	5.0				
OCDF	97.0	-----	10.0				
OCDD	4900.0	-----	10.0				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
P = PCDE Interference

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S1 - A,B,C Composite		
Lab Sample ID	10283720005		
Filename	F141022B_19		
Injected By	BAL		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	19.9	Dilution	NA
Dry Weight Extracted	8.17 g	Collected	09/28/2014 08:45
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141022B_08	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/22/2014 22:45

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	41.0	-----	1.0		2,3,7,8-TCDF-13C	2.00	73
Total TCDF	73.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	85
					1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	2.9	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	10.0	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	84
					1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	-----	25	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	71
2,3,4,7,8-PeCDF	36.0	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	280.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	70
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	15.0	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	33.0	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	67
					1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	59.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	79
1,2,3,6,7,8-HxCDF	37.0	-----	5.0		OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	22.0	-----	5.0				
1,2,3,7,8,9-HxCDF	28.0	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1400.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	26.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	240.0	-----	5.0				
1,2,3,7,8,9-HxCDD	65.0	-----	5.0				
Total HxCDD	840.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	570.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	37.0	-----	5.0		Equivalence: 140 ng/Kg		
Total HpCDF	1900.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	3900.0	-----	5.0	E			
Total HpCDD	7100.0	-----	5.0	E			
OCDF	700.0	-----	10.0				
OCDD	32000.0	-----	10.0	E			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
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NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
P = PCDE Interference
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S2 - A,B,C Composite		
Lab Sample ID	10283720006		
Filename	U141023B_06		
Injected By	SMT		
Total Amount Extracted	10.1 g	Matrix	Solid
% Moisture	18.0	Dilution	NA
Dry Weight Extracted	8.28 g	Collected	09/28/2014 08:25
ICAL ID	U141013	Received	10/01/2014 09:40
CCal Filename(s)	U141023B_01	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/23/2014 12:26

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**	
2,3,7,8-TCDF	17.0	-----	1.0		2,3,7,8-TCDF-13C	2.00	66	
Total TCDF	110.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	82	
					1,2,3,7,8-PeCDF-13C	2.00	68	
2,3,7,8-TCDD	-----	2.2	1.0	I	2,3,4,7,8-PeCDF-13C	2.00	63	
Total TCDD	4.9	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	74	
					1,2,3,4,7,8-HxCDF-13C	2.00	70	
1,2,3,7,8-PeCDF	50.0	-----	5.0		1,2,3,6,7,8-HxCDF-13C	2.00	63	
2,3,4,7,8-PeCDF	150.0	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	66	
Total PeCDF	1500.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	65	
					1,2,3,4,7,8-HxCDD-13C	2.00	74	
1,2,3,7,8-PeCDD	52.0	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	58	
Total PeCDD	140.0	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	61	DN2
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67	DN2
1,2,3,4,7,8-HxCDF	230.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	82	DN2
1,2,3,6,7,8-HxCDF	160.0	-----	5.0		OCDD-13C	4.00	76	DN2
2,3,4,6,7,8-HxCDF	100.0	-----	5.0					
1,2,3,7,8,9-HxCDF	140.0	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA	
Total HxCDF	3400.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA	
1,2,3,4,7,8-HxCDD	150.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	93	
1,2,3,6,7,8-HxCDD	1100.0	-----	5.0					
1,2,3,7,8,9-HxCDD	270.0	-----	5.0					
Total HxCDD	3700.0	-----	5.0					
1,2,3,4,6,7,8-HpCDF	2100.0	-----	5.0	DN2	Total 2,3,7,8-TCDD			
1,2,3,4,7,8,9-HpCDF	150.0	-----	5.0	DN2	Equivalence: 530 ng/Kg			
Total HpCDF	2300.0	-----	5.0	DN2	(Using 2005 WHO Factors)			
1,2,3,4,6,7,8-HpCDD	15000.0	-----	5.0	DN2				
Total HpCDD	28000.0	-----	5.0	DN2				
OCDF	1600.0	-----	10.0	DN2				
OCDD	120000.0	-----	10.0	DN2				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
I = Interference present
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S3 - A,B,C Composite		
Lab Sample ID	10283720007		
Filename	U141023B_07		
Injected By	SMT		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	22.7	Dilution	NA
Dry Weight Extracted	7.88 g	Collected	09/28/2014 09:40
ICAL ID	U141013	Received	10/01/2014 09:40
CCal Filename(s)	U141023B_01	Extracted	10/17/2014 20:00
Method Blank ID	BLANK-42406	Analyzed	10/23/2014 13:05

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	-----	2.1	1.0	I	2,3,7,8-TCDF-13C	2.00	51
Total TCDF	15.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	52
2,3,7,8-TCDD	ND	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	49
Total TCDD	ND	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	57
					1,2,3,4,7,8-HxCDF-13C	2.00	59
1,2,3,7,8-PeCDF	ND	-----	5.0		1,2,3,6,7,8-HxCDF-13C	2.00	52
2,3,4,7,8-PeCDF	10.0	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	54
Total PeCDF	110.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	52
					1,2,3,4,7,8-HxCDD-13C	2.00	61
1,2,3,7,8-PeCDD	ND	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	48
Total PeCDD	ND	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	44
					1,2,3,4,7,8,9-HpCDF-13C	2.00	44
1,2,3,4,7,8-HxCDF	16.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	52
1,2,3,6,7,8-HxCDF	12.0	-----	5.0		OCDD-13C	4.00	39
2,3,4,6,7,8-HxCDF	6.9	-----	5.0				
1,2,3,7,8,9-HxCDF	7.9	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	220.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	9.9	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	64.0	-----	5.0				
1,2,3,7,8,9-HxCDD	20.0	-----	5.0				
Total HxCDD	240.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	150.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	11.0	-----	5.0		Equivalence: 29 ng/Kg		
Total HpCDF	350.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	840.0	-----	5.0				
Total HpCDD	1600.0	-----	5.0				
OCDF	240.0	-----	10.0				
OCDD	5600.0	-----	10.0				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
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NC = Not Calculated

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I = Interference present

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-42406	Matrix	Solid
Filename	F141022B_13	Dilution	NA
Total Amount Extracted	10.4 g	Extracted	10/17/2014 20:00
ICAL ID	F141016	Analyzed	10/22/2014 18:24
CCal Filename(s)	F141022B_08	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	64
Total TCDF	ND	-----	1.0	2,3,7,8-TCDD-13C	2.00	74
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	66
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	59
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	65
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	66
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	63
				1,2,3,4,7,8-HxCDD-13C	2.00	60
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	64
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	73
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	-----	5.0	(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	5.0			
Total HpCDD	ND	-----	5.0			
OCDF	ND	-----	10.0			
OCDD	ND	-----	10.0			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-42407		
Filename	F141022B_11	Matrix	Solid
Total Amount Extracted	10.2 g	Dilution	NA
ICAL ID	F141016	Extracted	10/17/2014 20:00
CCal Filename	F141022B_08	Analyzed	10/22/2014 16:57
Method Blank ID	BLANK-42406	Injected By	BAL

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11	7.5	15.8	110
2,3,7,8-TCDD	10	9.7	6.7	15.8	97
1,2,3,7,8-PeCDF	50	59	40.0	67.0	117
2,3,4,7,8-PeCDF	50	61	34.0	80.0	121
1,2,3,7,8-PeCDD	50	52	35.0	71.0	103
1,2,3,4,7,8-HxCDF	50	62	36.0	67.0	125
1,2,3,6,7,8-HxCDF	50	58	42.0	65.0	116
2,3,4,6,7,8-HxCDF	50	59	35.0	78.0	117
1,2,3,7,8,9-HxCDF	50	57	39.0	65.0	115
1,2,3,4,7,8-HxCDD	50	55	35.0	82.0	110
1,2,3,6,7,8-HxCDD	50	65	38.0	67.0	130
1,2,3,7,8,9-HxCDD	50	60	32.0	81.0	121
1,2,3,4,6,7,8-HpCDF	50	59	41.0	61.0	118
1,2,3,4,7,8,9-HpCDF	50	53	39.0	69.0	106
1,2,3,4,6,7,8-HpCDD	50	54	35.0	70.0	108
OCDF	100	110	63.0	170.0	109
OCDD	100	120	78.0	144.0	120
2,3,7,8-TCDD-37Cl4	10	8.4	3.1	19.1	84
2,3,7,8-TCDF-13C	100	61	22.0	152.0	61
2,3,7,8-TCDD-13C	100	72	20.0	175.0	72
1,2,3,7,8-PeCDF-13C	100	66	21.0	192.0	66
2,3,4,7,8-PeCDF-13C	100	65	13.0	328.0	65
1,2,3,7,8-PeCDD-13C	100	75	21.0	227.0	75
1,2,3,4,7,8-HxCDF-13C	100	57	19.0	202.0	57
1,2,3,6,7,8-HxCDF-13C	100	62	21.0	159.0	62
2,3,4,6,7,8-HxCDF-13C	100	64	22.0	176.0	64
1,2,3,7,8,9-HxCDF-13C	100	64	17.0	205.0	64
1,2,3,4,7,8-HxCDD-13C	100	62	21.0	193.0	62
1,2,3,6,7,8-HxCDD-13C	100	60	25.0	163.0	60
1,2,3,4,6,7,8-HpCDF-13C	100	64	21.0	158.0	64
1,2,3,4,7,8,9-HpCDF-13C	100	67	20.0	186.0	67
1,2,3,4,6,7,8-HpCDD-13C	100	74	26.0	166.0	74
OCDD-13C	200	110	26.0	397.0	56

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
R = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Spiked Sample Report

Client - Ktec, LLC

Client's Sample ID	TnB - A,B,C Composite-MS		
Lab Sample ID	10283720001-MS		
Filename	F141022B_23	Matrix	Solid
Total Amount Extracted	10.4 g	Dilution	NA
ICAL ID	F141016	Extracted	10/17/2014 20:00
CCal Filename(s)	F141022B_08	Analyzed	10/23/2014 01:40
Method Blank ID	BLANK-42406	Injected By	BAL

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.21	106	2,3,7,8-TCDF-13C	2.00	31
Total TCDF				2,3,7,8-TCDD-13C	2.00	36
				1,2,3,7,8-PeCDF-13C	2.00	31
2,3,7,8-TCDD	0.20	0.17	84	2,3,4,7,8-PeCDF-13C	2.00	30
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	35
				1,2,3,4,7,8-HxCDF-13C	2.00	29
1,2,3,7,8-PeCDF	1.00	1.10	110	1,2,3,6,7,8-HxCDF-13C	2.00	30
2,3,4,7,8-PeCDF	1.00	1.13	113	2,3,4,6,7,8-HxCDF-13C	2.00	30
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	29
				1,2,3,4,7,8-HxCDD-13C	2.00	27 R
1,2,3,7,8-PeCDD	1.00	0.97	97	1,2,3,6,7,8-HxCDD-13C	2.00	31
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	29
				1,2,3,4,7,8,9-HpCDF-13C	2.00	28
1,2,3,4,7,8-HxCDF	1.00	1.12	112	1,2,3,4,6,7,8-HpCDD-13C	2.00	32
1,2,3,6,7,8-HxCDF	1.00	1.13	113	OCDD-13C	4.00	24
2,3,4,6,7,8-HxCDF	1.00	1.04	104			
1,2,3,7,8,9-HxCDF	1.00	1.05	105	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.17	117	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	1.00	1.15	115			
1,2,3,7,8,9-HxCDD	1.00	1.08	108			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	1.11	111			
1,2,3,4,7,8,9-HpCDF	1.00	0.95	95			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	1.36	136			
Total HpCDD						
OCDF	2.00	2.12	106			
OCDD	2.00	4.17	208			

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Spiked Sample Report

Client - Ktec, LLC

Client's Sample ID	TnB - A,B,C Composite-MSD		
Lab Sample ID	10283720001-MSD		
Filename	U141023B_02	Matrix	Solid
Total Amount Extracted	11.1 g	Dilution	NA
ICAL ID	U141013	Extracted	10/17/2014 20:00
CCal Filename(s)	U141023B_01	Analyzed	10/23/2014 09:51
Method Blank ID	BLANK-42406	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	0.20	0.24	121	2,3,7,8-TCDF-13C	2.00	54
Total TCDF				2,3,7,8-TCDD-13C	2.00	67
				1,2,3,7,8-PeCDF-13C	2.00	56
2,3,7,8-TCDD	0.20	0.18	92	2,3,4,7,8-PeCDF-13C	2.00	54
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	64
				1,2,3,4,7,8-HxCDF-13C	2.00	57
1,2,3,7,8-PeCDF	1.00	1.06	106	1,2,3,6,7,8-HxCDF-13C	2.00	56
2,3,4,7,8-PeCDF	1.00	1.07	107	2,3,4,6,7,8-HxCDF-13C	2.00	56
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	55
				1,2,3,4,7,8-HxCDD-13C	2.00	56
1,2,3,7,8-PeCDD	1.00	0.91	91	1,2,3,6,7,8-HxCDD-13C	2.00	56
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	53
				1,2,3,4,7,8,9-HpCDF-13C	2.00	52
1,2,3,4,7,8-HxCDF	1.00	1.11	111	1,2,3,4,6,7,8-HpCDD-13C	2.00	62
1,2,3,6,7,8-HxCDF	1.00	1.07	107	OCDD-13C	4.00	44
2,3,4,6,7,8-HxCDF	1.00	1.01	101			
1,2,3,7,8,9-HxCDF	1.00	1.02	102	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.16	116	2,3,7,8-TCDD-37Cl4	0.20	93
1,2,3,6,7,8-HxCDD	1.00	1.09	109			
1,2,3,7,8,9-HxCDD	1.00	1.09	109			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	1.11	111			
1,2,3,4,7,8,9-HpCDF	1.00	1.00	100			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	1.80	180			
Total HpCDD						
OCDF	2.00	2.19	109			
OCDD	2.00	5.64	282			

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613 Spike Sample Results

Client - Ktec, LLC

Client Sample ID	TnB - A,B,C Composite			Dry Weights	
Lab Sample ID	10283720001	Sample Filename	U141023B_05	Sample Amount	8.82 g
MS ID	10283720001-MS	MS Filename	F141022B_23	MS Amount	8.6 g
MSD ID	10283720001-MSD	MSD Filename	U141023B_02	MSD Amount	9.1 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDF	1.306	0.20	0.21	0.24	13.3	100	115	13.7
2,3,7,8-TCDD	0.000	0.20	0.17	0.18	9.4	84	92	9.4
1,2,3,7,8-PeCDF	0.000	1.00	1.10	1.06	3.7	109	105	3.8
2,3,4,7,8-PeCDF	0.000	1.00	1.13	1.07	5.4	113	107	5.4
1,2,3,7,8-PeCDD	0.000	1.00	0.97	0.91	5.6	96	91	5.7
1,2,3,4,7,8-HxCDF	0.000	1.00	1.12	1.11	1.5	112	110	1.6
1,2,3,6,7,8-HxCDF	0.000	1.00	1.13	1.07	5.7	113	107	5.7
2,3,4,6,7,8-HxCDF	0.000	1.00	1.04	1.01	3.0	104	101	3.0
1,2,3,7,8,9-HxCDF	0.000	1.00	1.05	1.02	3.1	104	101	3.2
1,2,3,4,7,8-HxCDD	0.000	1.00	1.17	1.16	0.5	117	116	0.5
1,2,3,6,7,8-HxCDD	0.000	1.00	1.15	1.09	4.7	115	109	4.7
1,2,3,7,8,9-HxCDD	0.000	1.00	1.08	1.09	1.3	107	108	1.3
1,2,3,4,6,7,8-HpCDF	0.000	1.00	1.11	1.11	0.2	110	110	0.1
1,2,3,4,7,8,9-HpCDF	0.000	1.00	0.95	1.00	5.1	95	100	5.1
1,2,3,4,6,7,8-HpCDD	27.358	1.00	1.36	1.80	27.6	113	155	31.4
OCDF	0.000	2.00	2.12	2.19	3.2	106	109	3.2
OCDD	159.613	2.00	4.17	5.64	30.1	140	209	39.7

Definitions

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Qm = Quantity Measured
Qs = Quantity Spiked
% Rec. = Percent Recovery
RPD = Relative Percent Difference
NA = Not Applicable
NC = Not Calculated

CDD = Chlorinated dibenzo-p-dioxin
CDF = Chlorinated dibenzo-p-furan
T = Tetra
Pe = Penta
Hx = Hexa
Hp = Hepta
O = Octa

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Kathleen Thorpe
Ktec, LLC
5583 Basil Street NE
Salem OR 97317

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Information:

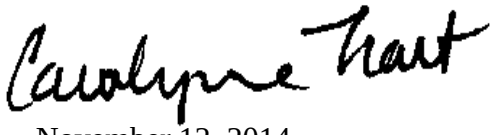
Pace Project #: 10283721
Sample Receipt Date: 10/01/2014
Client Project #: Boise Pipe (B)
Client Sub PO #: N/A
State Cert #: MN200001-005

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



November 12, 2014

Carolynne Trout, Project Manager
(612) 607-6351
(612) 607-6444 (fax)
Carolynne.Trout@pacelabs.com

Report Prepared Date:
November 12, 2014

ACCREDITED IN ACCORDANCE WITH nelac

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Ktec, LLC. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations.

Second column confirmation analyses of 2,3,7,8-TCDF values obtained from the primary (DB5-MS) column are performed only when specifically requested for a project and only when the values are above the concentration of the lowest calibration standard. Typical resolution for this isomer using the DB5-MS column ranges from 25-30%.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 61-101%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

In some cases, interfering substances impacted the determinations of PCDF congeners; the affected values were flagged "P" where polychlorinated diphenyl ethers were present. Concentrations above the calibration range were flagged "E" and should be regarded as estimates. One value was obtained from the analysis of a diluted extract and was flagged "D" and "N2".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of PCDDs and PCDFs at the reporting limits. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field samples.

Laboratory and matrix spike samples were also prepared with the sample batch using clean sand or sample matrix that had been fortified with native standard materials. The results show that the spiked native compounds were generally recovered at 75-130% with relative percent differences (RPDs) of 0.1-24.4%. The background-subtracted recoveries obtained for 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, HpCDD, OCDF, and OCDD in the matrix spike and/or matrix spike duplicate were outside the 70-130% target range. Also, the RPD value obtained for 1,2,3,6,7,8-HxCDF was above the 20% target upper limit. These deviations may be due to sample inhomogeneity and/or the presence of polychlorinated diphenyl ether interferences.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	92
Alaska	MN00064	Nebraska	
Arizona	AZ0014	Nevada	MN_00064_200
Arkansas	88-0680	New Jersey (NE	MN002
California	01155CA	New York (NEL	11647
Colorado	MN00064	North Carolina	27700
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-Q	Ohio	4150
Florida (NELAP	E87605	Oklahoma	D9922
Georgia (DNR)	959	Oregon (ELAP)	MN200001-005
Guam	959	Oregon (OREL	MN300001-001
Hawaii	SLD	Pennsylvania	68-00563
Idaho	MN00064	Puerto Rico	MN00064
Illinois	200012	Saipan	MP0003
Indiana	C-MN-01	South Carolina	74003001
Indiana	C-MN-01	Tennessee	TN02818
Iowa	368	Texas	T104704192-08
Kansas	E-10167	Utah (NELAP)	MN00064
Kentucky	90062	Virginia	00251
Louisiana	03086	Washington	C755
Maine	2007029	West Virginia	9952C
Maryland	322	Wisconsin	999407970
Michigan	9909	Wyoming	8TMS-Q
Minnesota	027-053-137		

REPORT OF LABORATORY ANALYSIS

Appendix A

Sample Management

Report No....10283721_1613B

Page 5 of 18

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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.

10283720 and 10283721

Page: 1 of 2

1711886

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: ktec LLC	Report To: Kathleen thorpe	Attention: kathleen thorpe
Address: 5593 Basil St NE	Copy To:	Company Name: ktec LLC
Salem OR 97317		Address: 5593 Basil St NE Slm
Email To: kathleen@cleanyourdirt.com	Purchase Order No.:	Pace Quote Reference:
Phone: 5035894311 Fax:	Project Name: Boise Pipe (B)	Pace Project Manager: Scott Unze
Requested Due Date/TAT: Normal TAT	Project Number:	Pace Profile #:

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

Site Location STATE: OR

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: 1613B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	TNB-A	SL	G	9/29	10:45															Please retain the separate samples for possible additional analysis
2	B Composite				10:40													X		
3	C				10:30															
4	TNS-A				10:50															
5	B Composite				10:55													Y		
6	C				11:00															
7	TSB-A				10:20															
8	B Composite				10:15													Y		
9	C				10:10															
10	TSS A				11:05															
11	B Composite			Y	11:10													X		
12	C	↓	↓	9/30	1:30															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				PACE	10-1-14	9:40	4.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kathleen J. thorpe

SIGNATURE of SAMPLER: Kathleen J. Thorpe DATE Signed (MM/DD/YY): 9/30/14

ORIGINAL

Comp 10/1/14 @ 7:00

*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-May-2007

Report No....10283721_1613B

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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.

1237519

Section A Required Client Information:

Company:	Keen LLC
Address:	5583 Basil St NE Salem OR 97317
Email To:	Kathleen@keenyourdirt.com
Phone:	503 5894311
Fax:	
Requested Due Date/TAT:	Normal

Section B Required Project Information:

Report To:	Kathleen Thorpe
Copy To:	
Purchase Order No.:	
Project Name:	Boise Pipe (B)
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: OR

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	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	1613B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S1-A	SL	G	9/29/14	8:45																
2	B composite				8:30																
3	C				8:40																
4	S2-A				8:10																
5	B composite				9:20														X		
6	C				8:25																
7	S3-A				9:20																
8	B composite				9:30														X		
9	C				9:40																
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				PACE	10-1-14	9:40	4.5	Y	N	Y

ORIGINAL

Comp 14:14 KH @17:50

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kathleen J. Thorpe

SIGNATURE of SAMPLER: Kathleen J. Thorpe DATE Signed (MM/DD/YY): 9/29/14

*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.

Scott Unze - Additional dioxin analysis

From: Kathleen Thorpe <kathleen@cleanyourdirt.com>
To: Scott Unze <Scott.Unze@pacelabs.com>
Date: 10/24/2014 4:54 PM
Subject: Additional dioxin analysis
Attachments: 10283720_1613B_dfr.pdf

I need you to analyze the discrete samples S2 - A, S2 - B and S2 - C.
The composite didn't look so very good.

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 28Feb2014 Page 1 of 1
	Document No.: F-MN-L-213-rev.09	Issuing Authority:

WO#: 10283720

WO#: 10283721

Sample Condition Upon Receipt

Client Name: Kbc LLC

Project #: 10283720

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client
☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 7915 1803 3900

10283721

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ N

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☐ Yes ☒ No

Thermom. Used: ☐ B88A9130516413 ☐ B88A912167504 ☒ B88A9132521491 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.3 **Cooler Temp Corrected (°C):** 4.8
Temp should be above freezing to 6°C **Correction Factor:** +0.5 **Date and Initials of Person Examining Contents:** 10-1-14 JM

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☐ Yes	☒ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11.
Sample Labels Match COC?	☒ Yes	☐ No	☐ N/A	12. Sample containers labeled on caps
-Includes Date/Time/ID/Analysis Matrix: SL				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☒ N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☐ Yes	☒ No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: @ **Date:** 10/7/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

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Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion

Appendix B

Sample Analysis Summary

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S2-A		
Lab Sample ID	10283721016		
Filename	F141105B_11		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	14.4	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	09/29/2014 08:10
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141105A_17	Extracted	10/31/2014 20:00
Method Blank ID	BLANK-42607	Analyzed	11/06/2014 04:47

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	8.1	-----	1.0		2,3,7,8-TCDF-13C	2.00	78
Total TCDF	18.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	90
					1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	ND	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	80
					1,2,3,4,7,8-HxCDF-13C	2.00	76
1,2,3,7,8-PeCDF	-----	14	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	9.9	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF	150.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	73
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	7.6	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	7.6	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	40.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	26.0	-----	5.0		OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	17.0	-----	5.0				
1,2,3,7,8,9-HxCDF	19.0	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	960.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	21.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	160.0	-----	5.0				
1,2,3,7,8,9-HxCDD	44.0	-----	5.0				
Total HxCDD	570.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	330.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	25.0	-----	5.0		Equivalence: 81 ng/Kg		
Total HpCDF	1000.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	2600.0	-----	5.0	E			
Total HpCDD	4800.0	-----	5.0	E			
OCDF	390.0	-----	10.0				
OCDD	21000.0	-----	10.0	E			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
P = PCDE Interference
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S2-B		
Lab Sample ID	10283721017		
Filename	F141105B_12		
Injected By	SMT		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	13.2	Dilution	NA
Dry Weight Extracted	11.4 g	Collected	09/29/2014 08:20
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141105A_17	Extracted	10/31/2014 20:00
Method Blank ID	BLANK-42607	Analyzed	11/06/2014 05:27

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	5.9	-----	1.0		2,3,7,8-TCDF-13C	2.00	79
Total TCDF	20.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	91
					1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	-----	12	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	23.0	-----	5.0		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	200.0	-----	5.0		1,2,3,7,8,9-HxCDF-13C	2.00	77
					1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	8.9	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	20.0	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	80
1,2,3,4,7,8-HxCDF	39.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	29.0	-----	5.0		OCDD-13C	4.00	67
2,3,4,6,7,8-HxCDF	19.0	-----	5.0				
1,2,3,7,8,9-HxCDF	18.0	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	920.0	-----	5.0		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	20.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	140.0	-----	5.0				
1,2,3,7,8,9-HxCDD	43.0	-----	5.0				
Total HxCDD	560.0	-----	5.0				
1,2,3,4,6,7,8-HpCDF	290.0	-----	5.0		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	22.0	-----	5.0		Equivalence: 77 ng/Kg		
Total HpCDF	900.0	-----	5.0		(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	2200.0	-----	5.0	E			
Total HpCDD	4300.0	-----	5.0	E			
OCDF	290.0	-----	10.0				
OCDD	16000.0	-----	10.0	E			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
P = PCDE Interference
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Sample Analysis Results

Client - Ktec, LLC

Client's Sample ID	S2-C		
Lab Sample ID	10283721018		
Filename	F141105B_13		
Injected By	SMT		
Total Amount Extracted	12.7 g	Matrix	Solid
% Moisture	25.8	Dilution	NA
Dry Weight Extracted	9.42 g	Collected	09/29/2014 08:25
ICAL ID	F141016	Received	10/01/2014 09:40
CCal Filename(s)	F141105A_17	Extracted	10/31/2014 20:00
Method Blank ID	BLANK-42607	Analyzed	11/06/2014 06:08

Native Isomers	**Conc** ng/Kg	**EMPC** ng/Kg	**RL** ng/Kg		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	41.0	-----	1.0		2,3,7,8-TCDF-13C	2.00	77
Total TCDF	280.0	-----	1.0		2,3,7,8-TCDD-13C	2.00	88
					1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	7.3	-----	1.0		2,3,4,7,8-PeCDF-13C	2.00	73
Total TCDD	23.0	-----	1.0		1,2,3,7,8-PeCDD-13C	2.00	81
					1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	-----	610	5.0	P	1,2,3,6,7,8-HxCDF-13C	2.00	80
2,3,4,7,8-PeCDF	-----	470	5.0	P	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	5700.0	-----	5.0	E	1,2,3,7,8,9-HxCDF-13C	2.00	80
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	200.0	-----	5.0		1,2,3,6,7,8-HxCDD-13C	2.00	72
Total PeCDD	470.0	-----	5.0		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	1200.0	-----	5.0		1,2,3,4,6,7,8-HpCDD-13C	2.00	101
1,2,3,6,7,8-HxCDF	790.0	-----	5.0		OCDD-13C	4.00	70
2,3,4,6,7,8-HxCDF	420.0	-----	5.0				
1,2,3,7,8,9-HxCDF	600.0	-----	5.0		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	31000.0	-----	5.0	E	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	480.0	-----	5.0		2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	4600.0	-----	5.0	E			
1,2,3,7,8,9-HxCDD	970.0	-----	5.0				
Total HxCDD	15000.0	-----	5.0	E			
1,2,3,4,6,7,8-HpCDF	8200.0	-----	5.0	E	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	630.0	-----	5.0		Equivalence: 2100 ng/Kg		
Total HpCDF	28000.0	-----	5.0	E	(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	59000.0	-----	5.0	E			
Total HpCDD	120000.0	-----	5.0	E			
OCDF	7100.0	-----	10.0	E			
OCDD	480000.0	-----	10.0	EDN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit.

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
P = PCDE Interference
E = Exceeds calibration range
D = Result obtained from analysis of diluted sample
Nn = Value obtained from additional analysis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-42607	Matrix	Solid
Filename	F141105A_04	Dilution	NA
Total Amount Extracted	20.0 g	Extracted	10/31/2014 20:00
ICAL ID	F141016	Analyzed	11/05/2014 12:34
CCal Filename(s)	F141105A_01	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	ND	-----	1.0	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	78
				1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	72
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	42
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	81
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	-----	5.0	(Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	5.0			
Total HpCDD	ND	-----	5.0			
OCDF	ND	-----	10.0			
OCDD	ND	-----	10.0			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-42608		
Filename	F141105A_02	Matrix	Solid
Total Amount Extracted	20.0 g	Dilution	NA
ICAL ID	F141016	Extracted	10/31/2014 20:00
CCal Filename	F141105A_01	Analyzed	11/05/2014 11:13
Method Blank ID	BLANK-42607	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	12	7.5	15.8	118
2,3,7,8-TCDD	10	9.4	6.7	15.8	94
1,2,3,7,8-PeCDF	50	63	40.0	67.0	126
2,3,4,7,8-PeCDF	50	62	34.0	80.0	124
1,2,3,7,8-PeCDD	50	52	35.0	71.0	103
1,2,3,4,7,8-HxCDF	50	65	36.0	67.0	129
1,2,3,6,7,8-HxCDF	50	61	42.0	65.0	121
2,3,4,6,7,8-HxCDF	50	59	35.0	78.0	118
1,2,3,7,8,9-HxCDF	50	60	39.0	65.0	120
1,2,3,4,7,8-HxCDD	50	59	35.0	82.0	118
1,2,3,6,7,8-HxCDD	50	62	38.0	67.0	124
1,2,3,7,8,9-HxCDD	50	61	32.0	81.0	121
1,2,3,4,6,7,8-HpCDF	50	59	41.0	61.0	119
1,2,3,4,7,8,9-HpCDF	50	53	39.0	69.0	106
1,2,3,4,6,7,8-HpCDD	50	52	35.0	70.0	104
OCDF	100	120	63.0	170.0	115
OCDD	100	120	78.0	144.0	122
2,3,7,8-TCDD-37Cl4	10	9.0	3.1	19.1	90
2,3,7,8-TCDF-13C	100	78	22.0	152.0	78
2,3,7,8-TCDD-13C	100	87	20.0	175.0	87
1,2,3,7,8-PeCDF-13C	100	80	21.0	192.0	80
2,3,4,7,8-PeCDF-13C	100	78	13.0	328.0	78
1,2,3,7,8-PeCDD-13C	100	84	21.0	227.0	84
1,2,3,4,7,8-HxCDF-13C	100	78	19.0	202.0	78
1,2,3,6,7,8-HxCDF-13C	100	84	21.0	159.0	84
2,3,4,6,7,8-HxCDF-13C	100	86	22.0	176.0	86
1,2,3,7,8,9-HxCDF-13C	100	77	17.0	205.0	77
1,2,3,4,7,8-HxCDD-13C	100	73	21.0	193.0	73
1,2,3,6,7,8-HxCDD-13C	100	74	25.0	163.0	74
1,2,3,4,6,7,8-HpCDF-13C	100	81	21.0	158.0	81
1,2,3,4,7,8,9-HpCDF-13C	100	72	20.0	186.0	72
1,2,3,4,6,7,8-HpCDD-13C	100	82	26.0	166.0	82
OCDD-13C	200	120	26.0	397.0	58

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
R = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Spiked Sample Report

Client - Ktec, LLC

Client's Sample ID	S2-A-MS		
Lab Sample ID	10283721016-MS		
Filename	F141105B_14	Matrix	Solid
Total Amount Extracted	12.6 g	Dilution	NA
ICAL ID	F141016	Extracted	10/31/2014 20:00
CCal Filename(s)	F141105A_17	Analyzed	11/06/2014 06:48
Method Blank ID	BLANK-42607	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.29	143		2,3,7,8-TCDF-13C	2.00	61
Total TCDF					2,3,7,8-TCDD-13C	2.00	69
					1,2,3,7,8-PeCDF-13C	2.00	59
2,3,7,8-TCDD	0.20	0.20	101		2,3,4,7,8-PeCDF-13C	2.00	56
Total TCDD					1,2,3,7,8-PeCDD-13C	2.00	61
					1,2,3,4,7,8-HxCDF-13C	2.00	61
1,2,3,7,8-PeCDF	1.00	1.33	133	P	1,2,3,6,7,8-HxCDF-13C	2.00	60
2,3,4,7,8-PeCDF	1.00	1.43	143		2,3,4,6,7,8-HxCDF-13C	2.00	62
Total PeCDF					1,2,3,7,8,9-HxCDF-13C	2.00	58
					1,2,3,4,7,8-HxCDD-13C	2.00	57
1,2,3,7,8-PeCDD	1.00	1.08	108		1,2,3,6,7,8-HxCDD-13C	2.00	53
Total PeCDD					1,2,3,4,6,7,8-HpCDF-13C	2.00	59
					1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	1.00	1.81	181		1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	1.00	1.87	187		OCDD-13C	4.00	43
2,3,4,6,7,8-HxCDF	1.00	1.35	135				
1,2,3,7,8,9-HxCDF	1.00	1.42	142		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF					1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.38	138		2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	1.00	2.53	253				
1,2,3,7,8,9-HxCDD	1.00	1.62	162				
Total HxCDD							
1,2,3,4,6,7,8-HpCDF	1.00	4.15	415				
1,2,3,4,7,8,9-HpCDF	1.00	1.21	121				
Total HpCDF							
1,2,3,4,6,7,8-HpCDD	1.00	24.16	2416	E			
Total HpCDD							
OCDF	2.00	5.47	273				
OCDD	2.00	176.18	8809	E			

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613B Spiked Sample Report

Client - Ktec, LLC

Client's Sample ID	S2-A-MSD		
Lab Sample ID	10283721016-MSD		
Filename	F141105B_15	Matrix	Solid
Total Amount Extracted	12.5 g	Dilution	NA
ICAL ID	F141016	Extracted	10/31/2014 20:00
CCal Filename(s)	F141105A_17	Analyzed	11/06/2014 07:29
Method Blank ID	BLANK-42607	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.		**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	0.20	0.29	146		2,3,7,8-TCDF-13C	2.00	81
Total TCDF					2,3,7,8-TCDD-13C	2.00	95
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	0.20	0.19	95		2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD					1,2,3,7,8-PeCDD-13C	2.00	84
					1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	1.00	1.33	133	P	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	1.00	1.40	140		2,3,4,6,7,8-HxCDF-13C	2.00	83
Total PeCDF					1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	1.00	1.06	106		1,2,3,6,7,8-HxCDD-13C	2.00	73
Total PeCDD					1,2,3,4,6,7,8-HpCDF-13C	2.00	80
					1,2,3,4,7,8,9-HpCDF-13C	2.00	77
1,2,3,4,7,8-HxCDF	1.00	1.67	167		1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	1.00	1.46	146		OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	1.00	1.36	136				
1,2,3,7,8,9-HxCDF	1.00	1.51	151		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF					1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.38	138		2,3,7,8-TCDD-37Cl4	0.20	96
1,2,3,6,7,8-HxCDD	1.00	2.67	267				
1,2,3,7,8,9-HxCDD	1.00	1.50	150				
Total HxCDD							
1,2,3,4,6,7,8-HpCDF	1.00	4.31	431				
1,2,3,4,7,8,9-HpCDF	1.00	1.22	122				
Total HpCDF							
1,2,3,4,6,7,8-HpCDD	1.00	24.79	2479	E			
Total HpCDD							
OCDF	2.00	5.49	275				
OCDD	2.00	194.07	9703	E			

Qs = Quantity Spiked Qm = Quantity Measured Rec. = Recovery (Expressed as Percent)

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1613 Spike Sample Results

Client - Ktec, LLC

Client Sample ID	S2-A			Dry Weights	
Lab Sample ID	10283721016	Sample Filename	F141105B_11	Sample Amount	10.8 g
MS ID	10283721016-MS	MS Filename	F141105B_14	MS Amount	10.8 g
MSD ID	10283721016-MSD	MSD Filename	F141105B_15	MSD Amount	10.7 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDF	8.127	0.20	0.29	0.29	1.8	99	102	2.9
2,3,7,8-TCDD	0.000	0.20	0.20	0.19	6.0	101	95	6.0
1,2,3,7,8-PeCDF	0.000	1.00	1.33	1.33	0.2	118	117	0.2
2,3,4,7,8-PeCDF	9.899	1.00	1.43	1.40	2.1	132	129	2.2
1,2,3,7,8-PeCDD	7.624	1.00	1.08	1.06	1.5	100	98	1.6
1,2,3,4,7,8-HxCDF	39.973	1.00	1.81	1.67	7.9	138	124	10.3
1,2,3,6,7,8-HxCDF	25.813	1.00	1.87	1.46	24.4	159	118	29.1
2,3,4,6,7,8-HxCDF	16.558	1.00	1.35	1.36	1.1	117	119	1.4
1,2,3,7,8,9-HxCDF	19.208	1.00	1.42	1.51	6.1	121	130	7.2
1,2,3,4,7,8-HxCDD	20.624	1.00	1.38	1.38	0.1	116	116	0.0
1,2,3,6,7,8-HxCDD	155.873	1.00	2.53	2.67	5.4	85	100	16.6
1,2,3,7,8,9-HxCDD	43.647	1.00	1.62	1.50	7.8	115	103	10.8
1,2,3,4,6,7,8-HpCDF	332.843	1.00	4.15	4.31	3.9	56	75	29.6
1,2,3,4,7,8,9-HpCDF	25.268	1.00	1.21	1.22	0.8	94	95	1.2
1,2,3,4,6,7,8-HpCDD	2637.218	1.00	24.16	24.79	2.6	0	0	0.0
OCDF	386.355	2.00	5.47	5.49	0.4	65	68	4.3
OCDD	21482.965	2.00	176.18	194.07	9.7	0	0	0.0

Definitions

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Qm = Quantity Measured
Qs = Quantity Spiked
% Rec. = Percent Recovery
RPD = Relative Percent Difference
NA = Not Applicable
NC = Not Calculated

CDD = Chlorinated dibenzo-p-dioxin
CDF = Chlorinated dibenzo-p-furan
T = Tetra
Pe = Penta
Hx = Hexa
Hp = Hepta
O = Octa

APPENDIX 2

Analytical Tables

Slope Samples													
Table 1. Dioxin in Soil Sampled 2011		B15	B15 (TEF)	B23-6"-1'	B23-6"-1' (TEQ)	B23-replicate	B23-replicate (TEQ)	B24	B24 (TEQ)	B25	B25 (TEQ)	B26	B26 (TEQ)
Dioxins in Soil, Units ng/kg													
2.3.7.8-TCDF	0.1		0	420.00	42.00	62	6.2	12.0	1.2	16.0	1.6	12.0	1.2
Total TCDF		1.5	0	710.00	0.00	98		66.0	0.0	79.0	0.0	32.0	0.0
2,3,7,8-TCDD	1		0	ND				1.8	1.8	2.7	2.7	1.1	1.1
Total TCDD			0	ND				4.4	0.0	9.5	0.0	12.0	0.0
													0.0
1,2,3,7,8-PeCDF	0.03		0	ND		6.5	0.195		0.0		0.0		0.0
2,3,4,7,8-PeCDF	0.3		0	120.00	36.00	11	3.3	86.0	25.8	120.0	36.0		0.0
Total PeCDF			0	1,100.00	0.00	61		740.0	0.0	1,100.0	0.0	90.0	0.0
													0.0
1,2,3,7,8-PeCDD	1		0	53.00	53.00			30.0	30.0	41.0	41.0	8.7	8.7
Total PeCDD			0	53.00				90.0	0.0	130.0	0.0	14.0	0.0
1,2,3,4,7,8-HxCDF	0.1		0	*230.00*		12	1.2	110.0	11.0	190.0	19.0	14.0	1.4
1,2,3,6,7,8-HxCDF	0.1		0	150.00	15.00	10	1	97.0	9.7	140.0	14.0	14.0	1.4
2,3,4,6,7,8-HxCDF	0.1		0	73.00	7.30			130.0	13.0	200.0	20.0	6.8	0.7
1,2,3,7,8,9-HxCDF	0.1		0	91.00	9.10	6.2	0.62	64.0	6.4	96.0	9.6	10.0	1.0
Total HxCDF			0	2,300.00		290		3,300.0	0.0	5,000.0	0.0	320.0	0.0
1,2,3,4,7,8-HxCDD	0.1		0	120	12.00	10	1	82.0	8.2	120.0	12.0	13.0	1.3
1,2,3,6,7,8-HxCDD	0.1		0	700	70.00	45	4.5	520.0	52.0	790.0	79.0	63.0	6.3
1,2,3,7,8,9-HxCDD	0.1		0	260	26.00	17	1.7	190.0	19.0	280.0	28.0	27.0	2.7
Total HxCDD			0	2900		220		2,000.0	0.0	3,000.0	0.0	270.0	0.0
1,2,3,4,6,7,8-HpCDF	0.01		0	1700	17.00	98	0.98	1,000.0	10.0	1,700.0	17.0	110.0	1.1
1,2,3,4,7,8,9-HpCDF	0.01		0	110	1.10	7.6	0.076	72.0	0.7	110.0	1.1	12.0	0.1
Total HpCDF		12	0	4200		300		3,200.0	0.0	5,100.0	0.0	330.0	0.0
1,2,3,4,6,7,8-HpCDD	0.01	13	0.13	14000	140.00	860	8.6	7,400.0	74.0	12,000.0	120.0	890.0	8.9
Total HPCDD		25	0	26000		2100		15,000.0	0.0	23,000.0	0.0	1,800.0	0.0
													0.0
OCDF	0.0003	15	0.0045	1300	0.39	130	0.039	910.0	0.3	1,300.0	0.4	100.0	0.0
OCDD	0.0003	110	0.033	100000	30.00	7100	2.13	63,000.0	18.9	88,000.0	26.4	6,400.0	1.9
Total 2,3,7,8-TCDD Equivalents			0.1675		**458.89**		**31.54**		**282.0**		**427.8**		**37.9**

	mg/kg	ng/kg	ppt
DEQ RBC - Urban resident direct contact	1.20E-05	1.20E+01	12
DEQ RBC - Occupational worker direct contact	2.00E-05	2.00E+01	20
DEQ RBC - Construction worker direct contact	1.50E-04	1.50E+02	150
DEQ Eco SLV - Mammal populations	6.00E-04	6.00E+02	600
DEQ Eco SLV - Bird populations	2.75E-04	2.75E+02	275

Abbreviations Citations

RBDM: denotes DEQ risk based cleanup goals Rev 4 Sept 15, 2009

RSL: EPA combined Regional Screening Level Table April 2009

Table 2. Dioxins in Soil Sample Date September 27, 2014		Pipe - Plan B																			
		North end of the Trench				South end of the Trench				Slope 1		Slope 2		Slope 3		Slope 2 - Discrete					
Sample ID	TEF	TnB - ABC	TnB - ABC TEF	TnS - ABC	TnS - ABC TEF	TSB - ABC	TSB - ABC TEF	TSS - ABC	TSS - ABC TEF	S1 - ABC	S1 - ABC TEF	S2 - ABC	S2 - ABC TEF	S3 - ABC	S3 - ABC TEF	S2 - A	S2 - A TEF	S2 - B	S2-B TEF	S2 - C	S2 - C TEF
Dioxins in Soil, Units ng/kg																					
2,3,7,8-TCDF	0.1	1.3	0.13			490	49	120.0	12.0	41.0	4.10	7.0	0.7	2.1	0.2	8.1	0.81	5.9	0.59	41	4.1
Total TCDF																					
2,3,7,8-TCDD	1					1	1			2.9	2.90	2.2	2.2							7.3	7.3
Total TCDD																					
1,2,3,7,8-PeCDF	0.03					46	1.38			25.0	0.75	50.0	1.5			14	0.42	12	0.36	610	18.3
2,3,4,7,8-PeCDF	0.3					36	10.8	9.9	3.0	36.0	10.80	150.0	45.0	10.0	3.0	9.9	2.97	23	6.9	470	141
Total PeCDF																					
1,2,3,7,8-PeCDD	1									15.0	15.00	52.0	52.0			7.6	7.6	8.9	8.9	200	200
Total PeCDD																					
1,2,3,4,7,8-HxCDF	0.1					21	2.1	6.6	0.7	59.0	5.90	230.0	23.0	16.0	1.6	40	4	39	3.9	1200	120
1,2,3,6,7,8-HxCDF	0.1									37.0	3.70	160.0	16.0	12.0	1.2	26	2.6	29	2.9	790	79
2,3,4,6,7,8-HxCDF	0.1									22.0	2.20	100.0	10.0	6.9	0.7	17	1.7	19	1.9	420	42
1,2,3,7,8,9-HxCDF	0.1									28.0	2.80	140.0	14.0	7.9	0.8	19	1.9	18	1.8	600	60
Total HxCDF																					
1,2,3,4,7,8-HxCDD	0.1					13	1.3	6.8	0.7	26.0	2.60	150.0	15.0	9.9	1.0	21	2.1	20	2	480	48
1,2,3,6,7,8-HxCDD	0.1					5.5	0.55	21.0	2.1	240.0	24.00	1,100.0	110.0	64.0	6.4	160	16	140	14	4600	460
1,2,3,7,8,9-HxCDD	0.1							12.0	1.2	65.0	6.50	270.0	27.0	20.0	2.0	44	4.4	43	4.3	970	97
Total HxCDD																					
1,2,3,4,6,7,8-HpCDF	0.01					26	0.26	58.0	0.6	570.0	5.70	2,100.0	21.0	150.0	1.5	330	3.3	290	2.9	8200	82
1,2,3,4,7,8,9-HpCDF	0.01									37.0	0.37	150.0	1.5	11.0	0.1	25	0.25	22	0.22	630	6.3
Total HpCDF																					
1,2,3,4,6,7,8-HpCDD	0.01	27	0.27	34	0.34	79	0.79	530.0	5.3	3,900.0	39.00	15,000.0	150.0	840.0	8.4	2600	26	2200	22	59000	590
Total HPCDD																					
OCDF	0.0003		0		0.00	98	0.0294	97.0		700.0	0.21	1,600.0	0.5	240.0	0.1	390	0.117	290	0.087	7100	2.13
OCDD	0.0003	160	0.048	310	0.09	910	0.273	4,900.0	1.5	32,000.0	9.60	120,000.0	36.0	5,600.0	1.7	21000	6.3	16000	4.8	480000	144
Total 2,3,7,8-TCDD Equivalents			0.448		0.43		**67.4824**		**27.0**		**136.13**		**525.4**		**28.6**		**80.5**		**77.6**		**2101.13**

Risk-Based Concentrations	mg/kg	ng/kg	ppt
DEQ RBC - Urban resident direct contact	1.20E-05	1.20E+01	**12**
DEQ RBC - Occupational worker direct contact	2.00E-05	2.00E+01	**15**
DEQ RBC - Construction worker direct contact	1.50E-04	1.50E+02	**150**
DEQ Eco SLV - Mammal populations	6.00E-04	6.00E+02	**600**
DEQ Eco SLV - Bird populations	2.75E-04	2.75E+02	**275**

Abbreviations Citations

ND = None detected at or above the reporting limit

RBDM: denotes DEQ risk based cleanup goals Rev 4 Sept 15, 2009

RSL: EPA combined Regional Screening Level Table April 2009

TNB = Trench North Bottom TSB = Trench South Bottom

TNS = Trench North Side TSS = Trench South Side

S1 = Slope 1

S2 = Slope 2

S3 = Slope 3