



July 28, 2015

Mr. David Brownlee
Georgia Environmental Protection Division
Hazardous Sites Response Program
2 Martin Luther King, Jr. Drive, SE
Atlanta, Georgia 30334-9000

**RE: Voluntary Investigation and Remediation Plan Application
Pilot Wastewater Treatment Plant - LaGrange
3102 Whitesville Road (Georgia State Highway 219)
LaGrange, Troup County, Georgia
HSI Site No. 10929
ECS Project No. 27-222188.00/00**

Dear Mr. Brownlee:

On the behalf of Pilot Flying J Travel Centers (Pilot), Environmental Compliance Services, Inc. (ECS), is please to submit the attached Voluntary Investigation and Remediation Plan (VIRP) Application with associated documentation for the above-reference site. The application fee of \$5,000.00 (US), as a check made payable to the Georgia Department of Natural Resources, has been mailed under separate cover.

If you have any questions or comments regarding this submittal, please contact Joey Cupp of Pilot at 865.474.2826, or Max Burmeister of ECS at 770.926.8883, extension 126.

Respectfully,

ENVIRONMENTAL COMPLIANCE SERVICES, INC.

Kenneth J. Perignat, PE
Senior Engineer

Max Burmeister
Program Manager

Attachments

c: Joey Cupp, Pilot



**VOLUNTARY INVESTIGATION AND
REMEDiation PLAN APPLICATION**

**PILOT SITE NO. 069
3102 WHITESVILLE ROAD
TROUP COUNTY
LAGRANGE, GEORGIA**

WHERE BUSINESS AND THE ENVIRONMENT CONVERGE

Prepared for:
Pilot Travel Centers
5508 Lonas Road
Knoxville, TN 37909

Project No. 27-222188.00/00
July 28, 2015

Prepared by:
ECS
9874 Main Street, Suite 100
Woodstock, GA 30188
tel 770.926.8883 fax 770.926.5383
www.ecsconsult.com

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1.0 INTRODUCTION

1.1 Introduction

On behalf of Pilot Flying J Travel Centers (Pilot), Environmental Compliance Services Inc. (ECS), formerly Pangean-CMD Associates (Pangean-CMD), is submitting this Voluntary Investigation and Remediation Plan (VIRP) Application for the Pilot Site No. 069 Waste Water Treatment Plant (WWTP), located at 3102 Whitesville Road (Georgia State Highway 219) in LaGrange, Troup County, Georgia. The VIRP Application and Checklist, completed with applicant's and professional engineer's signatures is included as **Attachment A**. Release notification, prepared by Pangean-CMD, was submitted on May 15, 2014 to the Georgia Environmental Protection Division (GEPD) Hazardous Sites Response Program. The site was listed by the GEPD in the State of Georgia Hazardous Site Inventory (HSI) on December 17, 2014, as a Class II site and assigned HSI No. 10929. It is Pilot's intention to qualify this site for the Voluntary Remediation Program (VRP) and conduct remedial action under the stipulated VRP regulations and guidelines. As requested in the VIRP Application and Checklist document, a parcel map is included in **Attachment B**, a copy of the warranty deed for the property is included in **Attachment C**; and a conceptual milestone schedule is included in **Attachment D**.

1.2 Site Historical Background

The subject property is described as Lot 236 of the Sixth District in LaGrange, Troup County, Georgia, with access available via Whitesville Road (Georgia Highway 219). The site, as currently owned by Pilot, is comprised of approximately 4.24 acres and is improved with a WWTP, and associated sludge pond, which services the following local commercial properties: Arby's Restaurant, Day's Inn Motel, Georgia Travel Center, McDonalds Oil Company, Pezold Management property, Ryder Truck Facility No. 217, Waffle House No. 646, and Pilot Travel Center No. 069. A site location and topographical map is presented as **Figure 1**. A site map presenting the WWTP and sludge pond vicinity of the site is included as **Figure 2**.

Historically, the associated sludge pond was utilized for the disposal of sludge waste generated during operation and maintenance (O&M) associated with the on-site WWTP. The practice was discontinued several years ago, though the exact dates of initiation and cessation of the sludge pond operation are unknown at this time. Pilot purchased the property on November 14, 2011, and has indicated that they have not utilized the sludge pond for the disposal of waste or sludge associated with the WWTP or other sources.

At the request of the GEPD, initial interim remedial activities were conducted in March 2014 following the observance of soil staining along the outer edges of the sludge pond and several areas in the surrounding vicinity.

It has been determined that the staining may likely be contributed to the flooding of the south adjacent creek, resulting in mobilization of the constituents confined within the sludge pond. Upon receiving notification of the occurrence, and following discussions with GEPD personnel, Pilot initiated emergency closure activities which included the analysis of the sludge layer within the pond slated for disposal, solidification and removal of the sludge located within the pond, and excavation of the pond subgrade soils along the bottom and sidewalls of the pond to depth of approximately 14 feet below ground surface (BGS).

Excavation and transportation of impacted sludges and soils was performed by Alexander's Industrial Service of Phenix City, Alabama. Approximately 4,610.79 tons of soil and solidified sludges were removed from the sludge pond and disposed of at the Salem Landfill in Opelika, Alabama. Upon completion of the excavation activities, seventeen sidewall samples (sample locations on figures indicated by prefix SW) were collected. A review of the soil analytical data indicated that elevated concentrations of 1,4-dioxane were detected in several of the sidewall samples. The excavation and confirmation sampling activities were summarized in the subsequent Release Notification.

A Release Notification, dated May 15, 2014, which summarized the initial response, excavation, and confirmation sampling activities, was submitted to the GEPD Hazardous Sites Response Program. This response indicated that an impact to soil and groundwater by 1,4-dioxane had been detected in soil and water samples collected from the vicinity of the sludge pond.

GEPD issued a "Request for Additional Work" correspondence, dated June 30, 2014, indicating that additional assessment activities were required prior providing HSI listing of the site. GEPD indicated in that clarification on the following aspects of the WWTP impact as indicated in the Release Notification and initial impact abatement (excavation activities) was required, as follows:

- Chemical analysis of the sodium polyacrylate solidification agent;
- Continued excavation of the sludge pond due to elevated 1,4-dioxane concentrations detected in sidewall samples SW-1 through SW-6 and SW-8 through SW-17;
- Additional soil sampling from the sludge pond floor and from the overflow areas of the sludge pond area;
- Installation and sampling of four permanent monitoring wells, located north, south, east, and west, of the sludge pond to delineate the 1,4-dioxane impact to groundwater;
- Further investigation of the WWTP effluent piping and rerouting past the sludge pond to the creek;

- Further investigation of the manhole structure which is reported to feed wastewater to the WWTP;
- Provide information of the WWTP influent by obtaining laboratory analysis of samples;
- A survey of the WWTP connections and the facilities which it services.

Pangean-CMD issued Request for Additional Work Response dated September 4, 2014. In addressing GEPD comments, Pangean-CMD offered the following responses:

- Following submittal of a sample of the sodium polyacrylate, the analytical laboratory, Accutest Laboratories Southeast, in Orlando, Florida, issued a letter indicating that analytical testing of the compound was not conducive to laboratory testing due to its hydrophilic properties;
- An additional ten soil borings (SB-1 through SB-10) were installed in August 2014 to further delineate the shallow surface impact due to the overspill of the sludge pond. A total of twenty soil samples were submitted for laboratory analysis of VOCs, SVOCs, and metals. Elevated concentrations of 1,4-dioxane (concentrations reported above the laboratory detection limits) were detected in fifteen of the submitted soil samples;
- Pangean-CMD asserted that additional sampling of the sludge pond floor (bottom) was proving problematic in obtaining a viable sample due to local drilling vendor equipment availability and capabilities. Previous sampling indicated that 1,4-dioxane was not detected at depths below 20 feet BGS;
- Pangean-CMD noted that based on the physical properties of 1,4-dioxane, notably is affinity to be miscible in water and lack of adsorption to soil particles, additional excavation of soils is not a feasible approach in mitigation of 1,4-dioxane impact in the sludge pond area;
- Additional soil sampling was conducted in the vicinity of the overspill areas. A total of six surficial soil samples (SS-1 through SS-6) were collected and submitted to Accutest Laboratories Southeast for analysis. Surface soil sample locations are presented on **Figure 3**. Laboratory analysis reported that concentrations of volatile organic compounds (VOCs) (including 1,4-dioxane), semi-volatile organic compounds (SVOCs), and metals, were below Tier 1 RRS concentrations;
- Four permanent groundwater monitoring wells (MW-1 through MW-4) were installed at the site in August 2014, located north, south, east, and west of the sludge pond vicinity. Laboratory analysis of groundwater samples obtained on August 15, 2014, indicated that elevated concentrations of 1,4-dioxane were detected in all four wells. The greatest concentration of 155,000 µg/L was reported in the groundwater sample obtained from MW-4, located between the sludge pond the creek outfall;

- Investigation of the WWTP discharge pipe indicated that the outfall piping had been repaired and routed along the western portion of the sludge pond to the current outfall at the creek;
- Waste water sampling was conducted on the WWTP influent water and submitted for laboratory analysis of VOCs, SVOCs, and metals, to Accutest Laboratories Southeast. Laboratory analysis of the wastewater sample indicated that all constituents were less than established maximum contaminant limits (MCLs) and/or Tier 1 RRS concentrations; and
- Pilot supplied a list of WWTP connections, noting that all connections serviced commercial properties located near the I-85 service area and unauthorized residential connections were not known to exist at that time.

Pangean-CMD issued the correspondence titled Request for Additional Work Response - Semi-Volatiles Data, dated October 21, 2014. This correspondence incorporated additional soil analytical data for the SVOC analysis of soil samples obtained at the site. This information is presented in this Application in **Table 2**.

The GEPD issued notice that the site had been listed to the Georgia Hazardous Site Inventory, issued Site Number 10929, on December 17, 2014. This listing notes that the site has been designated as Class II, indicating that further investigatory activities are required. The site was noted for impact to soil and groundwater by 1,4-dioxane and to soil by aniline in concentrations exceeding the reportable quantities.

GEPD issued the correspondence titled Compliance Status Call-in, dated January 30, 2015, in which to discuss the direction in which remedial actions would be conducted by Pilot at the site.

ECS issued Compliance Status Report Call-in correspondence dated March 31, 2015. This correspondence stated that Pilot had elected to submit the VIRP application and conduct investigatory and remedial actions under the State of Georgia VRP regulations.

1.3 Site Geology

The site is underlain by the fractured rocks of the Greenville Slope District, Southern Piedmont Section of the Piedmont Province (Clark and Zisa, 1976). In the Piedmont Province, the crystalline-bedrock aquifer is composed of highly deformed metamorphic and igneous rocks and ranges in thickness from about 10 to 10,000 feet (Cressler and others, 1983). Primary permeability in the crystalline rocks is low; however, there are areas of secondary permeability where high-yielding wells are present (Williams and others, 2005). Topographic elevation of the site is approximately 640 feet and slopes downward to Long Cane Creek which bounds the property to the south. The rock underlying the site is mapped as Hornblende Gneiss

Amphibolite. Borings onsite have typically encountered crusher run and gravel in the top 2 to 4 feet, transitioning to residual soils. Residual soils present in this area have typically been formed by in-place chemical and physical weathering of the parent rock types, or by physical weathering and transport along Long Cane Creek. Weathering is facilitated by foliation, fractures, veins, joints, and contacts between different rock units. The typical soil profile in this geologic setting consists of gray/tan/orange/brown clayey fine sandy silts near the ground surface, transitioning to gray/brown/white clayey sand, and then to sandy clay with depth to the top of the parent rock. Based on borings advanced at the site, soils consist of clayey, sandy silts near the ground surface, transitioning to clayey sand, and then to clay. Top of rock has not been encountered in borings advanced to 20 feet depth. According to the portion of United States Geologic Survey (USGS) Topographic Map presented as **Figure 1**, the site slopes gently to the south and southeast. Geologic cross sections, based on soil boring data, are included as **Figures 4, 5, and 6**. Ground surface elevations at the site range from approximately 700 feet above mean sea level (msl) to approximately 640 feet above msl from the northern to southern site property boundary based on a review of the USGS Topographic Map.

1.4 Site Hydrology

In Troup County, groundwater is obtained from shallow bored wells completed in the regolith and from deeper drilled wells completed in the fractured crystalline bedrock. Groundwater is transmitted through the regolith and secondary openings in the bedrock, such as along foliation, fractures, veins, joints, and contacts between different rock units that have undergone some degree of weathering (Cressler and others, 1983). The county is underlain by three rock units: (1) hornblende gneiss/amphibolite, (2) mica schist/gneiss/amphibolite, and (3) granite gneiss/granite (Lawton and Marsalis, 1976). Each of these rock units is composed of different rock types with varying hydrologic properties. In the Piedmont Geologic Region, groundwater generally occurs under water table conditions, and is stored in the overlying mantle of residuum and in the structural features (i.e., joints, veins, fractures, faults) present in the underlying rock. Recharge to the water table occurs primarily through precipitation infiltrating the upper soils and percolating downward, under the influence of gravity, to the groundwater table. Typically, the water table is not a level surface, but a subdued reflection of the land surface. Depth to the water table is variable and is dependent on many factors, including, but not necessarily limited to: the amount of rainfall, the permeability of the soil, the extent of fracturing in the underlying rock, and the amount of groundwater being pumped in the area. Also, buildings, pavements, and other impervious or low permeability features, may locally restrict recharge to the underlying water table. Groundwater potentiometric data and maps have been included in previous submittals to GEPD. The most recent potentiometric surface map from May 27, 2015 (**Figure 7**) indicates that overburden groundwater elevations at the site generally decline towards the south in the overburden. The site is situated on the southern flank of a topographic ridge that generally trends north to south and slopes generally toward the south and southeast down to

Long Cane Creek. Off site to the south, the topographic slope is reversed and is generally from south to north towards Long Cane Creek. Thus, groundwater hydraulic gradient appears to generally mimic surface topography, and is oriented in a southerly direction across the site toward Long Cane Creek, along the southern boundary of the site. Long Cane Creek surface water flows westward toward West Point Lake located approximately 6.5 miles west of the site. Ground surface elevations at the site range from approximately 700 feet above msl to approximately 640 feet above msl from the northern to southern site property boundary based on a review of the USGS Topographic Map. The hydraulic gradient is interpreted to be approximately 0.03 ft/ft on site toward the south and southeast towards Long Cane Creek.

Hydrological investigation is limited to the four on-site monitoring wells, and the surface water interfaces located within the sludge pond and the creek, both of which are interpreted to intercept the shallow groundwater table. Groundwater table depths are limited to the two groundwater gauging events conducted in August 2014 and May 2015.

The groundwater in the vicinity is interpreted to be shallow in extent, with average groundwater depths as follows:

- MW-1: approximately 6.07 feet BGS;
- MW-2: approximately 10.46 feet BGS;
- MW-3: approximately 8.77 feet BGS; and
- MW-4: approximately 6.35 feet BGS.

A summary of groundwater and surface water gauging measurements are presented in **Table 4**. A groundwater potentiometric map summarizing the groundwater elevations measured during the May 27, 2015, gauging activities is presented as **Figure 7**. A review of **Figure 7** tends to indicate that storm inflow is held within the sludge pond excavation and permeates radially outward towards the west, south, and east, with the overall groundwater flow trending southward towards the WWTP effluent outfall and Long Cane Creek.

2.0 PRELIMINARY CONCEPTUAL SITE MODEL

A conceptual site model (CSM), as required per Item No. 5 of the VIRP application, consisting of the potential receptors and impact to soil, groundwater, and surface water are presented in the following sections. It is understood that the CSM will be updated in subsequent reports as site-specific information is accumulated during further assessment activities.

2.1 Potential Receptors

The nearest surface water body was identified as Long Cane Creek, which bounds the property to the south. This creek functions as the discharge point for the WWTP operations. It is

understood that the piping from the WWTP has been routed to bypass the sludge pond and, following applicable treatment and NPDES permitting requirements, discharges to the creek. Further sampling and analysis of the creek surface water and creek bank sediments (upstream, downstream, and along the property boundary) is proposed to delineate the impact due to 1,4-dioxane.

The nearest residence was determined to be located at 104 Murphy Road, approximately 700 feet southwest from the southern portion of the interpreted sludge pond boundary. As this property is interpreted to be hydraulically separated from the subject site via groundwater conductance, the potential 1,4-dioxane impact due to surface water and sediment impact requires further investigation.

The nearest drinking water well was determined to be located at 3453 Whitesville Road, approximately 3,650 feet southeast from the southern portion of the interpreted sludge pond boundary. This property is interpreted to be hydraulically separated from the subject site and located upgradient from the subject site release. However, further investigation of the surface water in Long Cane Creek and associated sediments is proposed to eliminate possible impact to this receptor by 1,4-dioxane.

2.2 Soil Impact

A total of forty-seven soil samples have been submitted for laboratory analysis during the initial assessment of 1,4-dioxane impact at the WWTP sludge pond. These samples include seventeen sidewall samples (SW-1 through SW-17) collected on April 25, 2014, at the conclusion of the initial sludge pond excavation activities; the submittal of twenty soil samples from ten borings (SB-1 through SB-10) during delineation of the sludge pond impact on August 6, 2014; the submittal of six soil samples (SS-1 through SS-6) during the assessment of the potential overflow impact to surficial soils near the sludge pond on August 6, 2014; and the submittal of four soil samples collected from the boring during the installations of the four on-site monitoring wells (MW-1 through MW-4).

In order to evaluate the possible impact of constituents of concern at the subject site, soil sample analytical data were compared to Risk Reduction Standards (RRS) values as set forth in the Official Code of Georgia Annotated (OCGA) Section 391-3-19-.07 Appendix I and Appendix III, Table 2. ECS utilized the "Type 1" RRS values which assumes standardized exposure as defined for residential properties. Several VOCs, SVOCs, and metal constituents of concern were reported to be greater than the Tier 1 RRS concentrations in several of the soil samples collected during the assessment. 1,4-dioxane was detected above laboratory detection limits in thirty-six of the forty-seven submitted soil samples. Aniline was detected above Tier 1 RRS concentrations in soil samples SW-5 and SW-6, located along the western boundary of the

sludge pond excavation. A summary of the constituents of concerns detected in soil samples which exceeded the Tier 1 RRS concentrations are summarized below:

Soil Constituent of Concern Summary			
Acetone	Carbon disulfide ¹	p-Isopropylene ¹	m,p-Xylene
n-Butylbenzene ¹	1,4-Dioxane	n-Propylbenzene ¹	o-Xylene
sec-Butylbenzene ¹	Ethyl alcohol ¹	1,2,4-Trimethylbenzene ¹	Aniline
o-Chlorotoluene ¹	2-Hexanone ¹	1,3,5-Trimethylbenzene ¹	1-Methylnaphthalene ¹
Cobalt	Lead	2-Methylnaphthalene ¹	

Note: ¹ indicates that RRS concentration for constituent is not listed in Appendix I or Appendix III of OCGA § 391-3-19. Default RRS is laboratory detection limit unless otherwise stated.

A complete analytical summary of VOCs, SVOCs, and metals detected in soil samples are presented in **Tables 1, 2, and 3**. A summary of 1,4-dioxane concentrations in soil samples collected is presented in **Figure 8**.

Based on soil sample analytical data, 1,4-dioxane impact appears to be limited to the shallow soils at elevations less than 20 feet BGS. The horizontal delineation of 1,4-dioxane in soil has not been completed.

Based on soil sample analytical data, aniline impact is interpreted to be localized in the soils bound by the samples collected from SW-5 and SW-6. Western delineation is mitigated by the non-detection of aniline in soil samples collected from SB-10, to the north by SW-7, to the south by SB-4, and to the east via the previous excavation of potentially-impacted soils and sludges within the sludge pond.

2.3 Groundwater Impact

In order to evaluate the degree of impact due to dissolved-phase constituents of concern in the groundwater, groundwater analytical data were compared to OCGA § 391-3-19-.07 Appendix III, Table 1 values. ECS utilized the “Type 1” RRS values which assumes standardized exposure as defined for residential properties.

Groundwater monitoring currently consists of four monitoring wells located north, south, east, and west of the sludge pond location as shown on **Figure 2**. These monitoring wells were sampled on August 15, 2014, and again on May 27, 2015. Groundwater laboratory samples were submitted for analysis of VOCs, SVOCs, and metals. A summary of the groundwater analyses are presented in **Tables 5, 6, and 7**. A summary of the constituents of concern

detected in groundwater and reported to be greater than their respective RRS concentration are summarized below:

Groundwater Constituent of Concern Summary			
Bromochloromethane ¹	Bromodichloromethane ¹	Tert-butylbenzene ¹	Chloroform ¹
1,4-Dioxane ^{1,2}	Ethyl Alcohol ¹	2-Hexanone ¹	4-Methyl-2-pentanone ¹
Methyl Tertiary-Butyl Ether ¹	1,2,4-Trimethylbenzene ¹	1,3,5-Trimethylbenzene ¹	Benzoic Acid ¹
3&4-Methylphenol ¹	Benzyl Alcohol ¹	Barium	Total Cobalt ¹
Total Lead ²	Dissolved Cobalt ¹	Dissolved Lead	

Notes:

¹ indicates that RRS concentration for constituent is not listed in Appendix III of OCGA § 391-3-.19. Default RRS is laboratory detection limit unless otherwise stated.

² indicates constituent concentration was reported to be above RRS concentration during most recent sampling event (May 27, 2015).

Recent groundwater sampling event was conducted on May 27, 2015. Results of the laboratory analysis indicated that 1,4-dioxane was reported above laboratory detection limits in MW-2, MW-3, and MW-4, with the greatest concentration of 43,500 micrograms per liter (µg/L) reported in MW-4, located between the sludge pond and the creek. Additional VOCs and SVOCs analyzed in these samples were reported to be less than Tier 1 RRS concentrations. Total lead concentration reported in the groundwater sample obtained from MW-2 (15.9 µg/L) was reported to be above the Type 1 RRS value of 15.0 µg/L. The remaining metal constituents were reported to be less than their respective Type 1 RRS concentrations. A summary of groundwater analytical data are presented in **Tables 5, 6, and 7**. A summary of the May 27, 2015, groundwater analytical data for 1,4-dioxane and total lead are presented in **Figure 9**.

3.0 PRELIMINARY REMEDIAL ACTION

The site is currently classified by the HSI listing as a Class II site. Class II sites require further evaluation prior to GEPD issuing a decision as to the appropriate response and degree of corrective action to be implemented. Class II sites are not designated as requiring immediate corrective action, however responsible parties are required to complete the required assessment activities. Based on discovery and findings during assessment, GEPD may reclassify the site as deemed appropriate to the degree and extent of possible environmental impact.

Previous remedial activities have been conducted at the site in the form of excavation of impacted sludges and soils from the onsite sludge pond (source area). Approximately 4,610.79 tons of stabilized sludge and impacted soils were excavated and transported for off-site

disposal. Future remedial actions are anticipated to focus on the mitigation of the impact due to 1,4-dioxane detected in soil and groundwater.

As discussed in the Pangean-CMD correspondence titled Request for Additional Work Response, dated September 4, 2014, review of the properties of 1,4-dioxane indicate the compound is fully miscible in water. The low octanol-water partition coefficient and Henry's constant values indicate that the compound has little affinity to adsorb to organics and low volatilization potential. As understanding and regulation of 1,4-dioxane is relatively new, the reader is directed to review the US Environmental Protection Agency (EPA) Technical Fact Sheet on 1,4-Dioxane, dated January 2014, as attached in **Appendix E**. ECS will continue to research and confer with the GEPD as the developing the optimal remedial technique for implementation at this site.

3.1 Proposed Investigation Activities

The source of the 1,4-dioxane is from an unknown generator and of an undetermined quantity. Release of 1,4-dioxane appears to originate from within the sludge pond indicating that the source area may have been a discharge to the WWTP collection influent and subsequent discharge to the sludge pond, or directly to the sludge pond itself. The source is not anticipated to be related to standard operations and practices associated with the WWTP or the commercial businesses which utilize the WWTP for sewerage service.

Interim source removal of the impacted sludges and soils from within the sludge pond was performed in April 2014. Additional soil sampling and groundwater monitoring indicate that 1,4-dioxane is reported to exceed Type1 RRS concentrations in several of the submitted samples - note that there is no established RRS concentration for 1,4-dioxane and that an 'exceedance' of RRS values is considered a concentration which exceeds the laboratory detection limit.

Further evaluation of the horizontal groundwater and surface water extent of 1,4-dioxane is proposed. Additional assessment activities are proposed as follows:

- Install and sample an additional seven monitoring wells onsite, these wells will be positioned east, west and south of the existing sludge pond in order to delineate the dissolved-phase 1,4-dioxane impact detected in monitoring wells MW-2, MW-3, and MW-4. Proposed monitoring well locations are presented in **Figure 10**. Groundwater samples will be collected in accordance with USEPA Region 4 groundwater sampling operating procedure SESDPROC-301-R3, effective date March 6, 2013;
- Collect up to two surface water samples from the on-site sludge pond surface water in order to evaluate "source" area concentrations to those reported in groundwater from the surrounding monitoring network. Surface water samples will be collected in accordance

with USEPA Region 4 surface water sampling operating procedure SESDPROC-201-R3, effective date February 28, 2013;

- Collect approximately three surface water and sediment samples from Long Cane Creek to delineate potential transport and impact to the creek bed. Surface water and sediment samples would be collected from the vicinity of the WWTP outfall pipe; approximately 300 feet northeast of the WWTP outfall pipe at the eastern property boundary to evaluate upstream flow impact; and approximately 330 feet southwest of WWTP outfall pipe at the western property boundary to evaluate downstream impact. Surface water samples will be collected in accordance with USEPA Region 4 surface water sampling operating procedure SESDPROC-201-R3, effective date February 28, 2013. Sediment samples will be collected in accordance with USEPA Region 4 sediment sampling operating procedure SESDPROC-200-R3, effective date August 21, 2014;
- Sample wells semiannually during the investigation stage. Assessment and monitoring activities will be reported in semiannual reports;
- Evaluate and discuss with the GEPD, the potential for other potential receptors, such as drinking water wells, that may not be listed in the public record;
- Collect WWTP influent samples quarterly to monitor for COCs. Based on the type of access allotted at the WWTP, samples will be obtained in accordance with an applicable USEPA Region 4 sampling operating procedures; and
- Based on the evaluation of the continued groundwater and sediment analysis, continue to delineate the horizontal extent of 1,4-dioxane impact in groundwater and the creek surface water and sediment, procuring off-site access as need to complete the evaluation.

3.2 Proposed Remedial Activities

As previously stated, ECS will continue to confer with the GEPD and available literature as to researching an appropriate remedial solution to mitigate the groundwater impact due to 1,4-dioxane. Based on ECS' cursory review of available equipment and previous treatment applications, the use of a groundwater recovery system utilizing a combination of ultra-violet and/or ozone and/or chemical oxidation technique is most likely to be utilized. As the extent of 1,4-dioxane impact is unknown, the proposal of a remedial technology at this time is not deemed practicable.

4.0 REFERENCES

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FIGURES



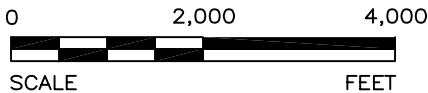
SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP

MAP SOURCE: 7.5 MINUTE SERIES, HILYER, GEORGIA, 1985
 MAP SOURCE: 7.5 MINUTE SERIES, CANNONVILLE, GEORGIA, 1984
 MAP SOURCE: 7.5 MINUTE SERIES, MOUNTVILLE, GEORGIA, 1982
 MAP SOURCE: 7.5 MINUTE SERIES, LAGRANGE, GEORGIA, 1982



QUAD LOCATION

SCALE 1:24,000



9874 Main Street, Suite 100, Woodstock, Ga. 30188
 Phone: 770-959-8883 Fax: 770-959-5583
 ecs@aol.com

PROJECT:

PILOT SITE NO. 69
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

TITLE:

SITE LOCATION MAP

COMPUTER CADFILE : PT000069-8.5x11qud2

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	RW	KP	KP
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
KP	5-16-14	PT-000069-02	1



LEGEND

- MONITORING WELL LOCATION
- ⊙ SOIL BORING LOCATION
- SIDE WALL SAMPLE LOCATION
- WATER SAMPLE LOCATION
- FENCE LINE



9874 MAIN STREET, SUITE 100, WOODSTOCK, GA 30188
 PHONE: 770-926-8883 FAX: 770-926-5383
 ececonsult.com

PROJECT: **PILOT SITE NO. 69**
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

TITLE: **SITE MAP**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**

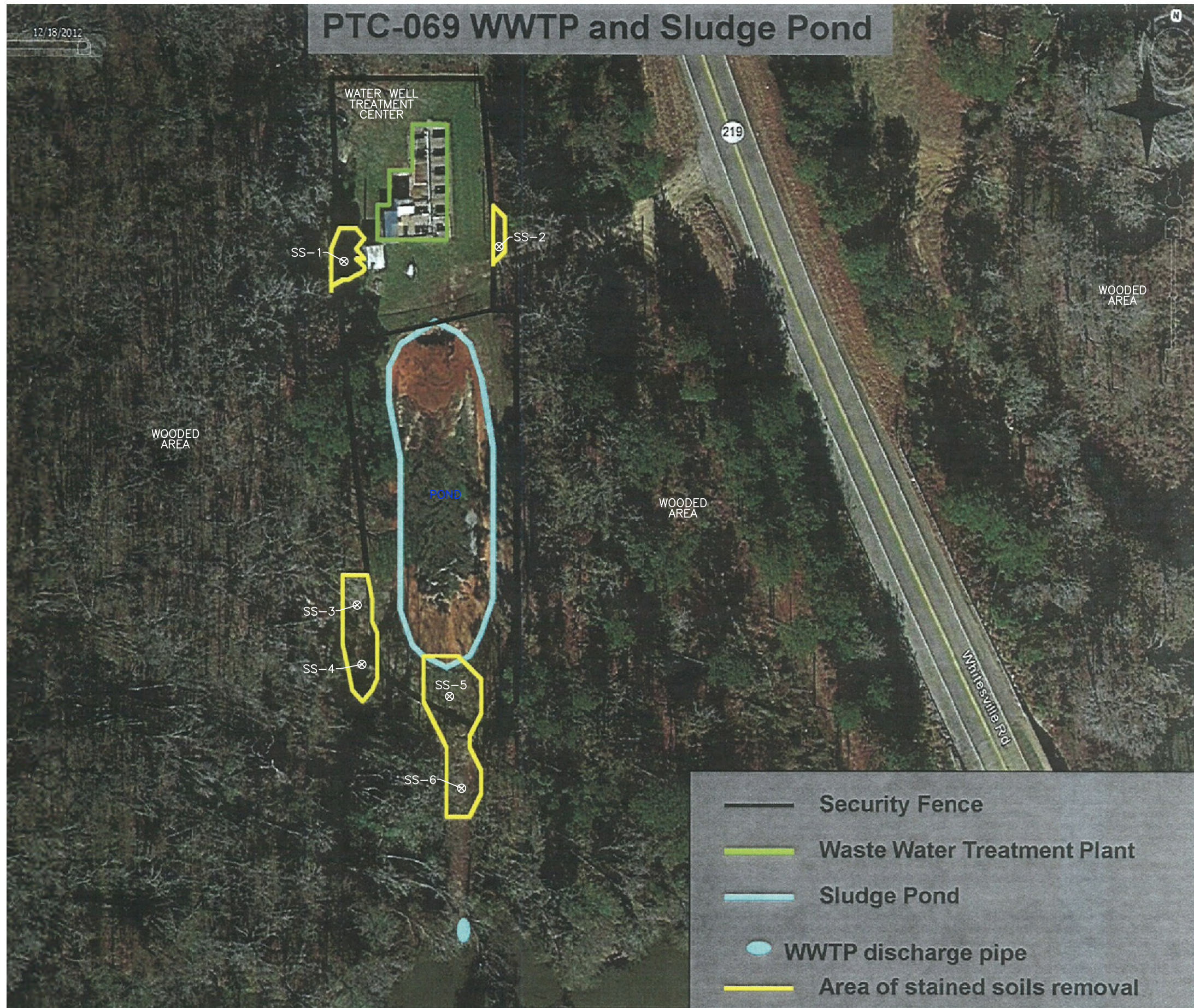
GRAPHIC SCALE: 30 15 0 15 30






COMPUTER CADFILE : PT000069-SIT1A

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	2	

12/18/2012

PTC-069 WWTP and Sludge Pond



-  Security Fence
-  Waste Water Treatment Plant
-  Sludge Pond
-  WWTP discharge pipe
-  Area of stained soils removal

LEGEND

⊗ SURFICIAL SAMPLES



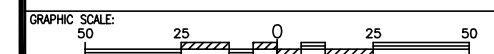
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PHONE: 770-926-8883 FAX: 770-926-5383
ecsconsult.com

PROJECT: **PILOT SITE NO. 69**

3102 WHITESVILLE ROAD
LAGRANGE, GEORGIA

TITLE: **SURFICIAL SAMPLE LOCATIONS**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**



COMPUTER CADFILE : PT000069-SIT2A

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	RW	MB	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
8-27-14	27-222188	3	



LEGEND

- MONITORING WELL LOCATION
- ⊙ SOIL BORING LOCATION
- SIDE WALL SAMPLE LOCATION
- WATER SAMPLE LOCATION
- FENCE LINE



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PROJECT: **PILOT SITE NO. 69**
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

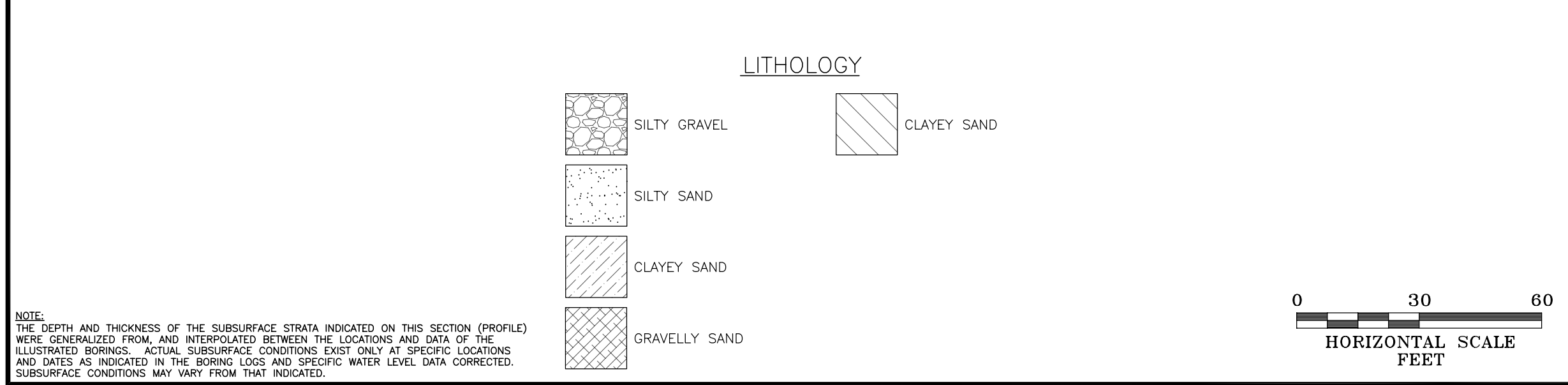
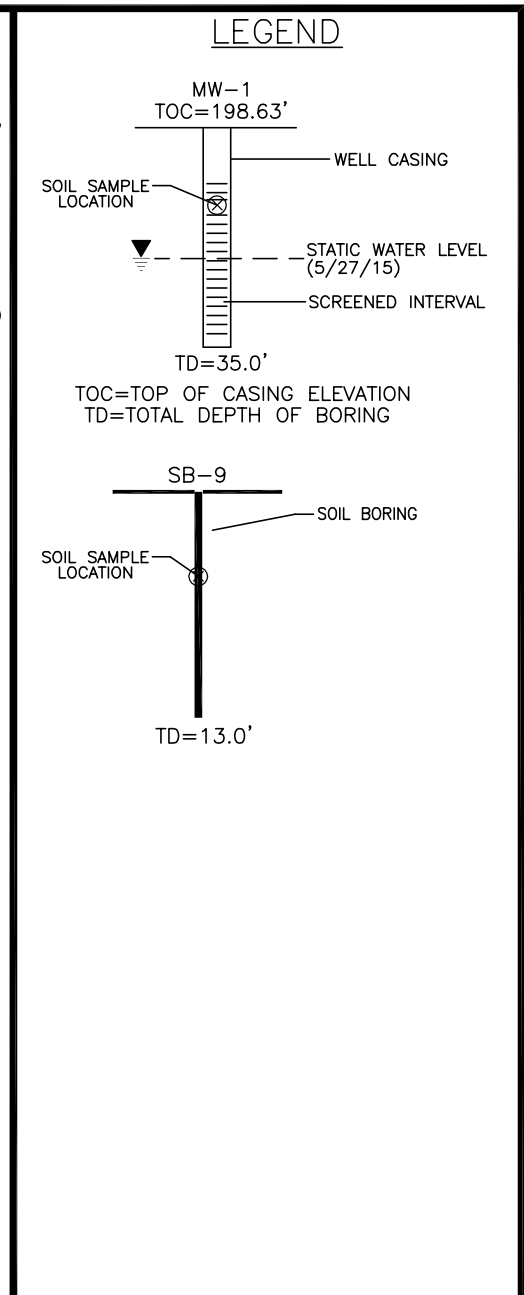
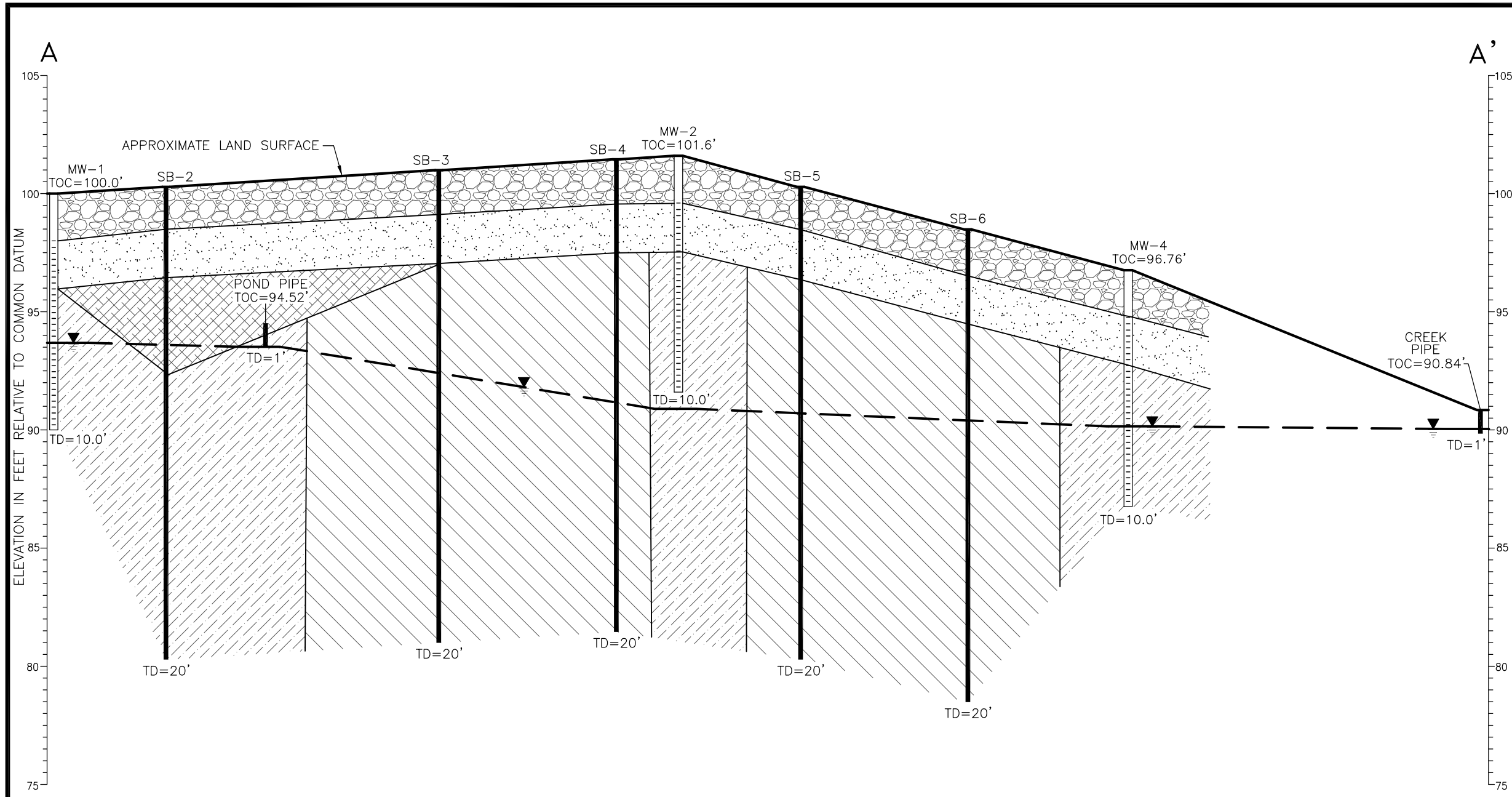
TITLE: **CROSS SECTION LOCATION MAP**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**

GRAPHIC SCALE: 30 15 0 15 30

COMPUTER CADFILE : PT000069-XSL

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	4	

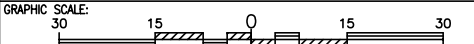


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PROJECT: **PILOT SITE NO. 69**
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

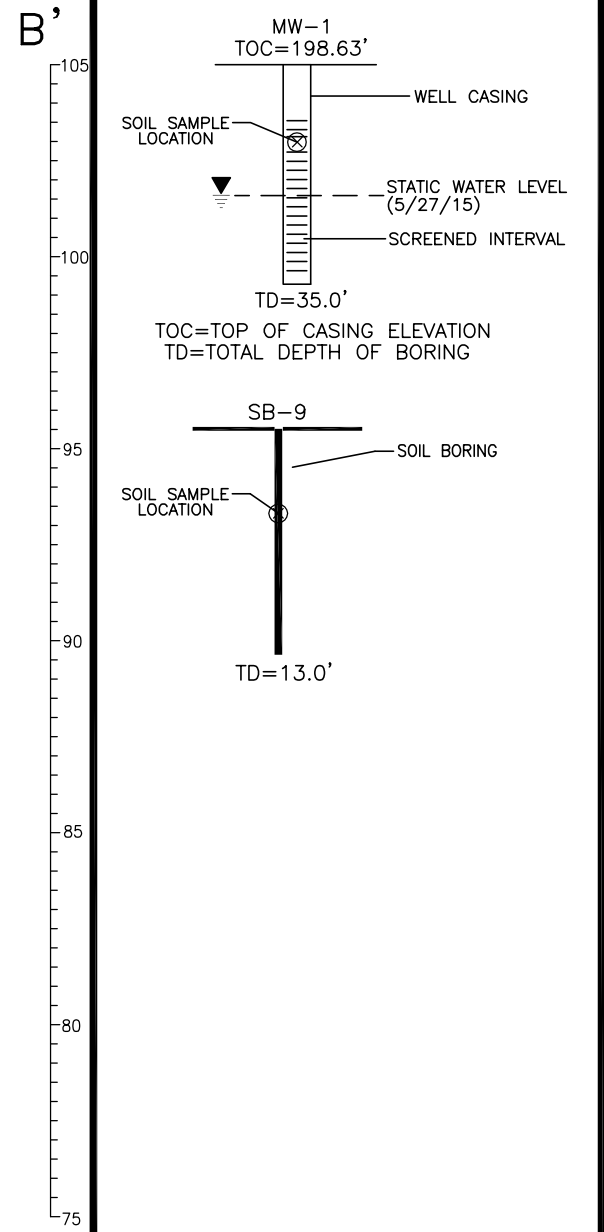
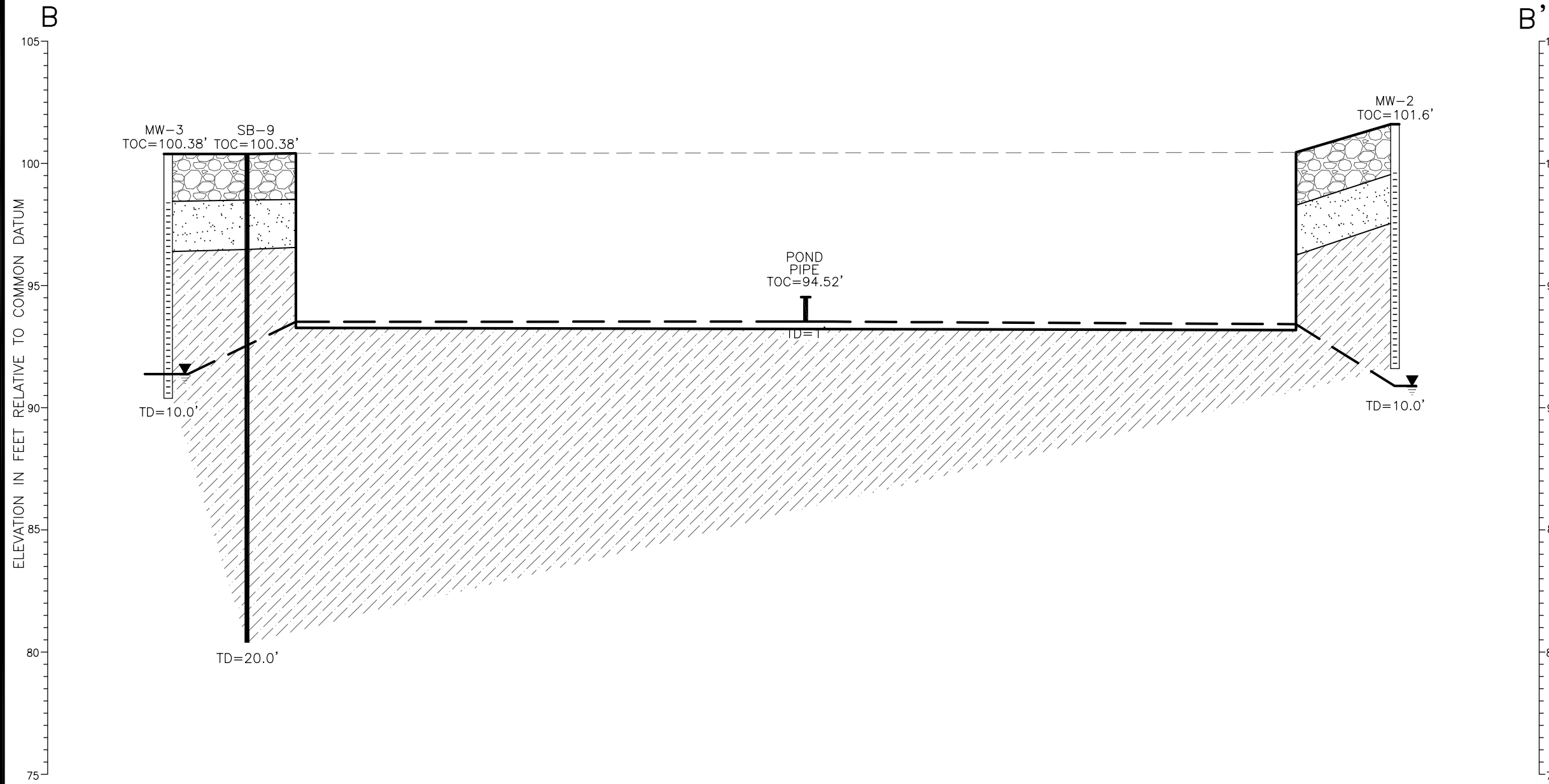
TITLE: **CROSS SECTION A-A'**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**

GRAPHIC SCALE:


COMPUTER CADFILE : PT000069-XSL

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	5	



NOTE:
THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THIS SECTION (PROFILE) WERE GENERALIZED FROM, AND INTERPOLATED BETWEEN THE LOCATIONS AND DATA OF THE ILLUSTRATED BORINGS. ACTUAL SUBSURFACE CONDITIONS EXIST ONLY AT SPECIFIC LOCATIONS AND DATES AS INDICATED IN THE BORING LOGS AND SPECIFIC WATER LEVEL DATA CORRECTED. SUBSURFACE CONDITIONS MAY VARY FROM THAT INDICATED.

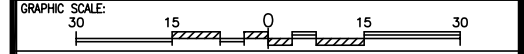


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PROJECT: **PILOT SITE NO. 69**
3102 WHITESVILLE ROAD
LAGRANGE, GEORGIA

TITLE: **CROSS SECTION B-B'**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**



COMPUTER CADFILE : PT000069-XSL

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	6	



LEGEND

- MONITORING WELL LOCATION
- FENCE LINE
- 90.89 GROUNDWATER ELEVATION IN FEET RELATIVE TO A COMMON DATUM
- 91.0 CONTOUR LINE OF ESTIMATED EQUAL GROUNDWATER ELEVATION IN FEET RELATIVE TO A COMMON DATUM
- ← APPROXIMATE GROUNDWATER FLOW DIRECTION

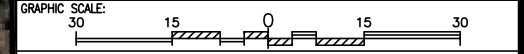


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 PHONE: 770-926-8883 FAX: 770-926-5383
 ececonsult.com

PROJECT: **PILOT SITE NO. 69**
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

TITLE: **POTENTIOMETRIC SURFACE MAP**
 for MAY 27, 2015

CLIENT: **PILOT FLYING J TRAVEL CENTERS**



COMPUTER CADFILE : PT000069-POT515

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	7	



LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- SIDE WALL SAMPLE LOCATION
- WATER SAMPLE LOCATION
- ⊗ SURFICIAL SAMPLES
- FENCE LINE
- - - SLUDGE POND EXCAVATION LIMITS
- · - · - AREA OF STAINED SOILS EXCAVATION LIMITS
- ⊗ WWTP DISCHARGE PIPE

MW-2	8/6/14	SAMPLE ID AND DATE
DEPTH	NA	SAMPLE DEPTH IN FEET
1,4-D	18.4	1,4-DIOXANE CONCENTRATION IN mg/kg

mg/kg MILLIGRAMS PER KILOGRAM
NA NOT APPLICABLE



9874 MAIN STREET, SUITE 100, WOODSTOCK, GA 30188
PHONE: 770-926-8883 FAX: 770-926-5383
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PROJECT: **PILOT SITE NO. 69**
3102 WHITESVILLE ROAD
LAGRANGE, GEORGIA

TITLE: **SOIL QUALITY MAP(1,4-DIOXANE)**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**

GRAPHIC SCALE: 0 20 40

COMPUTER CADFILE : PT000069-HYS			
DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
7-23-15	27-222188	8	



LEGEND

- MONITORING WELL LOCATION
- WATER SAMPLE LOCATION
- FENCE LINE

MW-2	SAMPLE ID
1,4-D	28,700(C)
LEAD	15.9

1,4-DIOXANE CONCENTRATION IN ppm
TOTAL LEAD CONCENTRATION IN ppm

ppm PARTS PER MILLION

MW-3
1,4-D 5,930

MW-2
1,4-D 28,700(C)
LEAD 15.9

MW-4
1,4-D 43,500

MW-1
1,4-D <200

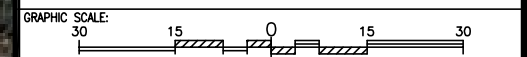


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PHONE: 770-926-8883 FAX: 770-926-5383
ecsconsult.com

PROJECT: **PILOT SITE NO. 69**
3102 WHITESVILLE ROAD
LAGRANGE, GEORGIA

TITLE: **GROUNDWATER QUALITY MAP for MAY 27, 2015**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**



COMPUTER CADFILE : PT000069-HYG

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
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LEGEND

- MONITORING WELL LOCATION
- ⊙ SOIL BORING LOCATION
- SIDE WALL SAMPLE LOCATION
- WATER SAMPLE LOCATION
- ⊕ PROPOSED MONITORING WELL LOCATION
- FENCE LINE



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 PHONE: 770-926-8883 FAX: 770-926-5383
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PROJECT: **PILOT SITE NO. 69**
 3102 WHITESVILLE ROAD
 LAGRANGE, GEORGIA

TITLE: **PROPOSED WELL LOCATION MAP**

CLIENT: **PILOT FLYING J TRAVEL CENTERS**

GRAPHIC SCALE: 30 15 0 15 30

COMPUTER CADFILE : PT000069-PRO2

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
EL	KP	KP	KP
DATE:	JOB NO.:	FIGURE NO.:	PAGE NO.:
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TABLES

TABLE 1
SOIL ANALYTICAL RESULTS
 Volatile Organic Compounds
 Results reported in mg/kg

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17	SB-1 (4-6 FT)
Lab Sample ID:	(mg/kg)	FA14532-1	FA14532-2	FA14532-3	FA14532-4	FA14532-5	FA14532-6	FA14532-7	FA14532-8	FA14532-9	FA14532-10	FA14532-11	FA14532-12	FA14532-13	FA14532-14	FA14532-15	FA14532-16	FA14532-17	FA17292-1
Date Sampled:		4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	8/6/2014
Methylene bromide	1000.00	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Methylene chloride	0.08	<0.75	<0.92	<0.87	<0.56	<0.55	<0.60	<0.0075	<0.0070	<0.72	<0.55	<0.52	<0.53	<0.46	<0.56	<0.61	<0.56	<0.0095	<0.0089
Methyl ethyl ketone	2.00	<1.9	<2.3	<2.2	<1.4	<1.4	<1.5	<0.019	0.0058J	<1.8	<1.4	<1.3	<1.3	<1.2	<1.4	<1.5	<1.4	0.0396	<0.0222
Methyl Tert Butyl Ether	NE	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Naphthalene	100.00	0.329J	0.393J	<0.44	<0.28	<0.27	0.526	<0.0037	<0.0035	1.93	0.570	<0.26	0.684	<0.23	0.146J	<0.31	<0.28	0.0036J	<0.0044
n-Propylbenzene	NE	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	0.0728J	0.0866J	<0.26	0.358	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Styrene	0.10	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,1,1,2-Tetrachloroethane	0.07	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,1,1-Trichloroethane	0.20	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,1,2,2-Tetrachloroethane	0.13	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,1,2-Trichloroethane	0.50	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,2,3-Trichlorobenzene	NE	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,2,3-Trichloropropane	0.54	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,2,4-Trichlorobenzene	10.83	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	0.103J	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
1,2,4-Trimethylbenzene	NE	0.184J	0.360J	<0.44	0.139J	<0.27	0.231J	<0.0037	<0.0035	1.03	0.628	<0.26	1.19	0.0568J	0.109J	<0.31	<0.28	0.0054	<0.0044
1,3,5-Trimethylbenzene	NE	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	0.172J	0.123J	<0.26	0.602	<0.23	<0.28	<0.31	<0.28	0.0011J	<0.0044
Tetrachloroethylene	NE	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	0.0061	<0.0044
Toluene	14.40	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	1.36	0.987	<0.26	<0.27	<0.23	0.112J	0.0918J	<0.28	0.0046J	<0.0044
Trichloroethylene	0.13	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Trichlorofluoromethane	0.70	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Vinyl chloride	0.04	<0.38	<0.46	<0.44	<0.28	<0.27	<0.30	<0.0037	<0.0035	<0.36	<0.27	<0.26	<0.27	<0.23	<0.28	<0.31	<0.28	<0.0048	<0.0044
Vinyl Acetate	0.51	<1.9	<2.3	<2.2	<1.4	<1.4	<1.5	<0.019	<0.017	<1.8	<1.4	<1.3	<1.3	<1.2	<1.4	<1.5	<1.4	<0.024	<0.022
m,p-Xylene	20.00	<0.75	<0.92	<0.87	<0.56	<0.55	<0.60	<0.0075	<0.0070	0.153J	0.152J	<0.52	0.229J	<0.46	<0.56	<0.61	<0.56	0.0053J	<0.0089
o-Xylene	20.00	<0.38	<0.46	<0.44	<0.28	<0.27	0.0715J	<0.0037	<0.0035	0.112J	0.0962J	<0.26	0.386	<0.23	<0.28	<0.31	<0.28	0.0025J	<0.0044

Notes:
 mg/kg: milligrams per kilogram
 Bold: Values in bold exceed the Laboratory detection limit
 Shaded: Values which are shaded exceed the Applicable Standard
 Applicable Standard: Concentration values obtained from Appendix I of OCGA § 391-3-.19
 Constituents with no reported RRS value are evaluated to their laboratory detection limit.
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated method blank
 N: Indicates presumptive evidence of a compound
 a: Dilution required due to matrix interference.
 b: Elevated reporting limits due to matrix interference.
 c: Outside control limits due to dilution.

TABLE 1
SOIL ANALYTICAL RESULTS
 Volatile Organic Compounds
 Results reported in mg/kg

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SB-1 (16-20 FT)	SB-2 (4-6 FT)	SB-2 (16-20 FT)	SB-3 (4-6 FT)	SB-3 (16-20 FT)	SB-4 (4-5 FT)	SB-4 (16-20 FT)	SB-5 6-8 (FT)	SB-5 (16-20 FT)	SB-6 (6-8 FT)	SB-6 (16-20 FT)	SB-7 (14-16 FT)	SB-7 (16-20 FT)	SB-8 (4-6 FT)	SB-8 (16-20 FT)
Lab Sample ID:	(mg/kg)	FA17292-2	FA17292-3	FA17292-4	FA17292-5	FA17292-6	FA17292-7	FA17292-8	FA17292-23	FA17292-24	FA17292-21	FA17292-22	FA17292-19	FA17292-20	FA17292-17	FA17292-18
Date Sampled:		8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Methylene bromide	1000.00	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Methylene chloride	0.08	<0.0039	<0.0036	<0.0059	<0.40	<0.0086	<0.021	<0.0062	<0.0078	<0.0071	<0.31	<0.0087	<0.012	<0.0086	<0.011	<0.0042
Methyl ethyl ketone	2.00	<0.0039	<0.0036	<0.029	<1.0	<0.022	0.101	0.0065 J	0.0167 J	<0.018	<1.5	<0.022	<0.0058	<0.022	<0.026	<0.021
Methyl Tert Butyl Ether	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Naphthalene	100.00	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	0.0345	<0.0035	0.393	<0.0043	<0.0058	<0.0043	0.0158	<0.0042
n-Propylbenzene	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	0.0257	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	0.0050 J	<0.0042
Styrene	0.10	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,1,1,2-Tetrachloroethane	0.07	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,1,1-Trichloroethane	0.20	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,1,2,2-Tetrachloroethane	0.13	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,1,2-Trichloroethane	0.50	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,2,3-Trichlorobenzene	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,2,3-Trichloropropane	0.54	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,2,4-Trichlorobenzene	10.83	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	0.108 J	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
1,2,4-Trimethylbenzene	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	0.0328	<0.0042
1,3,5-Trimethylbenzene	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	0.0084	<0.0042
Tetrachloroethylene	NE	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Toluene	14.40	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Trichloroethylene	0.13	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Trichlorofluoromethane	0.70	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Vinyl chloride	0.04	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	<0.0039	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	<0.0053	<0.0042
Vinyl Acetate	0.51	<0.019	<0.018	<0.029	<1.0	<0.022	<0.054	<0.0031	<0.020	<0.018	<1.5	<0.022	<0.029	<0.022	0.026	<0.021
m,p-Xylene	20.00	<0.0078	<0.0071	<0.012	<0.40	<0.0086	<0.021	<0.0062	0.0144	<0.0071	<0.61	<0.0087	<0.012	<0.0086	0.0027	<0.0085
o-Xylene	20.00	<0.0039	<0.0036	<0.0059	<0.20	<0.0043	<0.011	<0.0031	0.0133	<0.0035	<0.31	<0.0043	<0.0058	<0.0043	0.0028	<0.0042

Notes:
 mg/kg: milligrams per kilogram
 Bold: Values in bold exceed the Laboratory de
 Shaded: Values which are shaded exceed the
 Applicable Standard: Concentration values ob
 Constituents with no reported RRS value are
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated meth
 N: Indicates presumptive evidence of a comp
 a: Dilution required due to matrix interferenc
 b: Elevated reporting limits due to matrix interf
 c: Outside control limits due to dilution.

TABLE 1
SOIL ANALYTICAL RESULTS
 Volatile Organic Compounds
 Results reported in mg/kg

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID: Lab Sample ID: Date Sampled:	Applicable Standard (mg/kg)	SB-9 (4-6 FT)	SB-9 (16-20 FT)	SB-10 (8-10 FT)	SAB-10 (16-20 FT)	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	MW-1(6-8ft)	MW-2(4-6ft)	MW-3(6-8ft)	MW-4(4-6ft)
		FA17292-15	FA17292-16	FA17292-9	FA17292-10	FA17292-25	FA17292-26	FA17292-27	FA17292-28	FA17292-29	FA17292-30	FA17292-13	FA17292-14	FA17292-11	FA17292-12
		8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Methylene bromide	1000.00	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0023	<0.0037	<0.0043	<0.0039	<0.0040
Methylene chloride	0.08	<0.0093	<0.011	<0.0069	<0.0097	<0.0097	<0.0058	<0.0097	<0.0089	<0.010	<0.0093	<0.018	<0.0085	<0.0078	<0.0080
Methyl ethyl ketone	2.00	<0.023	0.0287	<0.017	<0.024	0.0131 J	<0.0058	0.0147 J	0.0315	0.168	0.0458	<0.0037	0.0365	<0.020	0.0231
Methyl Tert Butyl Ether	NE	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
Naphthalene	100.00	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	0.016	<0.0039	<0.0040
n-Propylbenzene	NE	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	0.0013 J	<0.0045	<0.0051	<0.0046	<0.0037	0.0022 J	<0.0039	<0.0040
Styrene	0.10	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,1,1,2-Tetrachloroethane	0.07	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,1,1-Trichloroethane	0.20	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,1,2,2-Tetrachloroethane	0.13	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,1,2-Trichloroethane	0.50	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,2,3-Trichlorobenzene	NE	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,2,3-Trichloropropane	0.54	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
1,2,4-Trichlorobenzene	10.83	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	0.0011 J	<0.0037	<0.0043	<0.0039	<0.0040
1,2,4-Trimethylbenzene	NE	<0.0046	0.0018 J	<0.0035	<0.0048	<0.0048	0.0021 J	0.0049	<0.0045	<0.0051	<0.0046	<0.0037	0.0157	<0.0039	<0.0040
1,3,5-Trimethylbenzene	NE	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	0.0013 J	<0.0045	<0.0051	<0.0046	<0.0037	0.0034 J	<0.0039	<0.0040
Tetrachloroethylene	NE	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
Toluene	14.40	<0.0046	<0.0054	<0.0035	<0.0048	0.0013 J	0.0020 J	0.0035 J	0.0019 J	0.0023 J	0.0051	<0.0037	0.0082	<0.0039	0.0028
Trichloroethylene	0.13	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
Trichlorofluoromethane	0.70	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
Vinyl chloride	0.04	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	<0.0048	<0.0045	<0.0051	<0.0046	<0.0037	<0.0043	<0.0039	<0.0040
Vinyl Acetate	0.51	<0.023	<0.027	<0.017	<0.024	<0.024	<0.029	<0.024	<0.022	<0.026	<0.023	<0.018	<0.021	<0.020	<0.020
m,p-Xylene	20.00	<0.0093	<0.011	<0.0069	<0.0097	<0.0097	<0.012	0.0016 J	<0.0089	<0.010	<0.0093	<0.0073	0.0030 J	<0.0078	<0.0080
o-Xylene	20.00	<0.0046	<0.0054	<0.0035	<0.0048	<0.0048	<0.0058	0.0017 J	<0.0045	<0.0051	<0.0046	<0.0037	0.0022 J	<0.0039	<0.0040

Notes:
 mg/kg: milligrams per kilogram
 Bold: Values in bold exceed the Laboratory de
 Shaded: Values which are shaded exceed the
 Applicable Standard: Concentration values ob
 Constituents with no reported RRS value are
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated meth
 N: Indicates presumptive evidence of a comp
 a: Dilution required due to matrix interference.
 b: Elevated reporting limits due to matrix interf
 c: Outside control limits due to dilution.

TABLE 2
SOIL ANALYTICAL RESULTS
 Semi-Volatile Organic Compounds
 Results reported in mg/kg

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17
Lab Sample ID:	(mg/kg)	FA14532-1	FA14532-2	FA14532-3	FA14532-4	FA14532-5	FA14532-6	FA14532-7	FA14532-8	FA14532-9	FA14532-10	FA14532-11	FA14532-12	FA14532-13	FA14532-14	FA14532-15	FA14532-16	FA14532-17
Date Sampled:		4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014
Diethyl phthalate	0.74	<4.8	<4.5	<4.3	<4.3	<0.40	<8.4	<0.38	<0.39	<3.8	<3.8	<0.81	<3.9	<3.9	<4.2	<8.6	<8.6	<0.44
Dimethyl phthalate	0.66	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
bis(2-Ethylhexyl)phthalate	50.00	1.82J	1.11J	<4.3	<4.3	0.0567J	5.09J	<0.38	<0.39	3.41J	2.01J	0.185J	2.71J	0.432J	6.82	4.35J	5.75J	0.131J
Fluoranthene	500.00	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Fluorene	360.00	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Hexachlorobenzene	2.14	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Hexachlorobutadiene	17.50	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Hexachlorocyclopentadiene	15.20	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Hexachloroethane	9.99	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Indeno(1,2,3-cd)pyrene	5.00	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Isophorone	0.19	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
1-Methylnaphthalene	NE	<2.4	0.231J	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	0.546J	0.336J	<0.40	0.658J	<1.9	0.260J	<4.3	<4.3	<0.22
2-Methylnaphthalene	NE	0.241J	0.292J	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	1.01J	0.434J	<0.40	0.810J	<1.9	0.342J	<4.3	0.493J	<0.22
2-Nitroaniline	NE	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
3-Nitroaniline	NE	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
4-Nitroaniline	NE	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Naphthalene	100.00	<2.4	0.383J	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	1.48J	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Nitrobenzene	0.70	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
N-Nitrosodimethylamine	0.66	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2 a	<0.19 a	<0.19 a	<1.9 a	<1.9 a	<0.40 a	<1.9 a	<1.9 a	<2.1 a	<4.3 a	<4.3 a	<0.22 a
N-Nitroso-di-n-propylamine	1.71	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
N-Nitrosodiphenylamine	6.46	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22
Phenanthrene	110.00	0.281J	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	0.252J	0.255J	<0.40	0.397J	<1.9	0.851J	<4.3	1.45J	<0.22
Pyrene	500.00	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	0.229J	<1.9	<0.40	0.222J	<1.9	0.316J	<4.3	<4.3	<0.22
Pyridine	0.038	<4.8	<4.5	<4.3	<4.3	<0.40	<8.4	<0.38	<0.39	<3.8	<3.8	<0.81	<3.9	<3.9	<4.2	<8.6	<8.6	<0.44
1,2,4-Trichlorobenzene	10.83	<2.4	<2.2	<2.2	<2.1	<0.20	<4.2	<0.19	<0.19	<1.9	<1.9	<0.40	<1.9	<1.9	<2.1	<4.3	<4.3	<0.22

Notes:
 mg/kg: milligrams per kilogram
 Bold: Values in bold exceed the Laboratory detection limit
 Shaded: Values which are shaded exceed the Applicable Standard
 Applicable Standard: Concentration values obtained from Appendix I of OCGA § 391-3-.19
 Constituents with no reported RRS value are evaluated to their laboratory detection limit.
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated method blank
 N: Indicates presumptive evidence of a compound
 a: Dilution required due to matrix interference.
 b: Elevated reporting limits due to matrix interference.
 c: Outside control limits due to dilution.

TABLE 2
SOIL ANALYTICAL RESULTS
 Semi-Volatile Organic Compounds
 Results reported in mg/kg

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard (mg/kg)	SB-1 (4-6 FT)	SB-1 (16-20 FT)	SB-2 (4-6FT)	SB-2 (16-20 FT)	SB-3 (4-6 FT)	SB-3 (16-20 FT)	SB-4 (4-5FT)	SB-4 (16-20 FT)	SB-5 6-8 (FT)	SB-5 (16-20 FT)	SB-6 (6-8 FT)	SB-6 (16-20 FT)	SB-7 (14-16 FT)	SB-7 (16-20 FT)
Lab Sample ID:		FA17292-1	FA17292-2	FA17292-3	FA17292-4	FA17292-5	FA17292-6	FA17292-7	FA17292-8	FA17292-23	FA17292-24	FA17292-21	FA17292-22	FA17292-19	FA17292-20
Date Sampled:		8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Diethyl phthalate	0.74	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
Dimethyl phthalate	0.66	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
bis(2-Ethylhexyl)phthalate	50.00	< 0.044	< 0.039	< 0.038	< 0.045	0.846	< 0.042	0.110 J	< 0.037	0.551 J	< 0.042	3.61 J	< 0.038	< 0.046	< 0.042
Fluoranthene	500.00	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Fluorene	360.00	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Hexachlorobenzene	2.14	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Hexachlorobutadiene	17.50	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Hexachlorocyclopentadiene	15.20	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Hexachloroethane	9.99	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Indeno(1,2,3-cd)pyrene	5.00	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Isophorone	0.19	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
1-Methylnaphthalene	NE	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	0.142 J	< 0.021	0.235 J	< 0.019	< 0.023	< 0.021
2-Methylnaphthalene	NE	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	0.180 J	< 0.021	0.318 J	< 0.019	< 0.023	< 0.021
2-Nitroaniline	NE	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
3-Nitroaniline	NE	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
4-Nitroaniline	NE	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
Naphthalene	100.00	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Nitrobenzene	0.70	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
N-Nitrosodimethylamine	0.66	< 0.026	< 0.023	< 0.022	< 0.026	< 0.021	< 0.025	< 0.036	< 0.021	< 0.095	< 0.024	< 0.24	< 0.022	< 0.027	< 0.024
N-Nitroso-di-n-propylamine	1.71	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
N-Nitrosodiphenylamine	6.46	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Phenanthrene	110.00	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	0.0850 J	< 0.021	0.632 J	< 0.019	< 0.023	< 0.021
Pyrene	500.00	< 0.022	< 0.020	< 0.019	< 0.023	0.0311 J	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021
Pyridine	0.038	< 0.044	< 0.039	< 0.038	< 0.045	< 0.036	< 0.042	< 0.062	< 0.037	< 0.16	< 0.042	< 0.42	< 0.038	< 0.046	< 0.042
1,2,4-Trichlorobenzene	10.83	< 0.022	< 0.020	< 0.019	< 0.023	< 0.018	< 0.021	< 0.031	< 0.018	< 0.082	< 0.021	< 0.21	< 0.019	< 0.023	< 0.021

Notes:
 mg/kg: milligrams per kilogram
 Bold: Values in bold exceed the Laboratory de
 Shaded: Values which are shaded exceed the
 Applicable Standard: Concentration values ob
 Constituents with no reported RRS value are e
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated methc
 N: Indicates presumptive evidence of a compo
 a: Dilution required due to matrix interferenc
 b: Elevated reporting limits due to matrix interfi
 c: Outside control limits due to dilution.

TABLE 2

SOIL ANALYTICAL RESULTS

Semi-Volatile Organic Compounds

Results reported in mg/kg

LaGrange WWTP

3102 Whiteville Road (Highway 219)

LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SB-8 (4-6 FT)	SB-8 (16-20 FT)	SB-9 (4-6 FT)	SB-9 (16-20 FT)	SB-10 (8-10 FT)	SAB-10 (16-20 FT)	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	MW-1(6-8ft)	MW-2(4-6ft)	MW-3(6-8ft)	MW-4(4-6ft)
Lab Sample ID:	Standard (mg/kg)	FA17292-17	FA17292-18	FA17292-15	FA17292-16	FA17292-9	FA17292-10	FA17292-25	FA17292-26	FA17292-27	FA17292-28	FA17292-29	FA17292-30	FA17292-13	FA17292-14	FA17292-11	FA17292-12
Date Sampled:		8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Diethyl phthalate	0.74	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
Dimethyl phthalate	0.66	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
bis(2-Ethylhexyl)phthalate	50.00	0.238 J	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	0.0364 J	< 0.040	0.854	< 0.034	0.0516 J	0.56	< 0.040	< 0.041
Fluoranthene	500.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Fluorene	360.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Hexachlorobenzene	2.14	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Hexachlorobutadiene	17.50	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Hexachlorocyclopentadiene	15.20	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Hexachloroethane	9.99	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Indeno(1,2,3-cd)pyrene	5.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Isophorone	0.19	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
1-Methylnaphthalene	NE	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	0.0222 J	<0.020	<0.021
2-Methylnaphthalene	NE	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	0.0361 J	<0.020	<0.021
2-Nitroaniline	NE	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
3-Nitroaniline	NE	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
4-Nitroaniline	NE	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
Naphthalene	100.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Nitrobenzene	0.70	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
N-Nitrosodimethylamine	0.66	< 0.025	< 0.025	< 0.026	< 0.024	< 0.022	< 0.026	< 0.024	< 0.020	< 0.020	< 0.023	< 0.020	< 0.020	<0.023	<0.024	<0.024	<0.024
N-Nitroso-di-n-propylamine	1.71	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	0.0325 J	< 0.017	<0.020	<0.021	<0.020	<0.021
N-Nitrosodiphenylamine	6.46	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	0.0376 J	<0.020	<0.021
Phenanthrene	110.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021
Pyrene	500.00	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	0.0716 J	< 0.017	<0.020	<0.021	<0.020	<0.021
Pyridine	0.038	< 0.043	< 0.042	< 0.045	< 0.041	< 0.038	< 0.044	< 0.041	< 0.035	< 0.034	< 0.040	< 0.035	< 0.034	<0.040	<0.042	<0.040	<0.041
1,2,4-Trichlorobenzene	10.83	< 0.021	< 0.021	< 0.023	< 0.021	< 0.019	< 0.022	< 0.020	< 0.017	< 0.017	< 0.020	< 0.017	< 0.017	<0.020	<0.021	<0.020	<0.021

Notes:

mg/kg: milligrams per kilogram

Bold: Values in bold exceed the Laboratory de

Shaded: Values which are shaded exceed the

Applicable Standard: Concentration values ob

Constituents with no reported RRS value are e

E: Indicates value exceeds calibration range

J: Indicates an estimated value

B: Indicates analyte found in associated meth

N: Indicates presumptive evidence of a comp

a: Dilution required due to matrix interfer

b: Elevated reporting limits due to matrix inter

c: Outside control limits due to dilution.

TABLE 3
SOIL ANALYTICAL RESULTS

Metals
Results reported in mg/kg

LaGrange WWTP
3102 Whiteville Road (Highway 219)
LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17	SB-1 (4-6 FT)
Lab Sample ID:	(mg/kg)	FA14532-1	FA14532-2	FA14532-3	FA14532-4	FA14532-5	FA14532-6	FA14532-7	FA14532-8	FA14532-9	FA14532-10	FA14532-11	FA14532-12	FA14532-13	FA14532-14	FA14532-15	FA14532-16	FA14532-17	FA17292-1
Date Sampled:		4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	4/25/2014	8/6/2014
Arsenic	20	<3.1 b	<2.5 b	0.66	1.0 b	<2.7 b	<1.8 b	0.57	<2.0 b	<1.9 b	<1.7 b	<8.2 b	<1.9 b	<1.9 b	<1.9 b	<2.6 b	<2.3 b	0.74	<5.1
Barium	1000	<63 b	<49 b	34.3	40.2 b	61.2 b	44.1 b	31.3	52.6 b	54.5 b	42.6 b	<160 b	40.5 b	25.4	23.6	31.6	40.1	32.8	159
Cadmium	2	<1.3 b	<0.99 b	<0.26	<0.38 b	<1.1 b	<0.73 b	<0.22	<0.81 b	<0.77 b	<0.67 b	<3.3 b	<0.78 b	<0.78 b	<0.74 b	<1.0 b	<0.92 b	<0.20	<2.0
Chromium	100	19.1 b	20.8 b	12.9	13.5 b	10.4 b	10.8 b	5.6	2.6 b	4.4 b	11.0 b	8.4 b	14.9 b	9.0 b	10.5 b	21.4 b	16.9 b	6.8	15.1
Cobalt	20	71.2 b	<12 b	<3.2	7.3 b	<13 b	33.8 b	<2.7	<10 b	<9.7 b	<8.4 b	<41 b	12.8 b	<9.7 b	<9.3 b	65.2 b	<11 b	5.7	<25
Lead	75	15.7	10.9	7.1	9.1	9.6	6.0	8.6	5.0	6.8	7.1	10.7	14.7	6.7	6.4	13.2	12.6	11.7	19.8
Mercury	0.5	<0.058	<0.052	<0.052	0.057	<0.050	<0.047	<0.046	<0.046	<0.046	<0.045	<0.046	<0.044	<0.047	<0.051	0.054	<0.048	<0.052	0.059
Nickle	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<20
Selenium	2	<6.3 b	<4.9 b	<1.3	<1.9 b	<5.3 b	<3.7 b	<1.1	<4.1 b	<3.9 b	<3.4 b	<16 b	<3.9 b	<3.9 b	<3.7 b	<5.1 b	<4.6 b	<0.98	<10
Silver	2	<3.1 b	<2.5 b	<0.65	<0.96 b	<2.7 b	<1.8 b	<0.55	<2.0 b	<1.9 b	<1.7 b	<8.2 b	<1.9 b	<1.9 b	<1.9 b	<2.6 b	<2.3 b	<0.49	<5.1

Notes:
mg/kg: milligrams per kilogram
Bold: Values in bold exceed the Laboratory detection limit
Shaded: Values which are shaded exceed the Applicable Standard
Applicable Standard: Concentration values obtained from Appendix III Table 2 of OCGA § 391-3-.19
Constituents with no reported RRS value are evaluated to their laboratory detection limit.
E: Indicates value exceeds calibration range
J: Indicates an estimated value
B: Indicates analyte found in associated method blank
N: Indicates presumptive evidence of a compound
a: Dilution required due to matrix interference.
b: Elevated reporting limits due to matrix interference.
c: Outside control limits due to dilution.

TABLE 3
SOIL ANALYTICAL RESULTS

Metals
Results reported in mg/kg

LaGrange WWTP
3102 Whiteville Road (Highway
LaGrange, Troup County, Georg

Client Sample ID:	Applicable	SB-1 (16-20 FT)	SB-2 (4-6 FT)	SB-2 (16-20 FT)	SB-3 (4-6 FT)	SB-3 (16-20 FT)	SB-4 (4-5 FT)	SB-4 (16-20) FT	SB-5 6-8 (FT)	SB-5 (16-20 FT)	SB-6 (6-8 FT)	SB-6 (16-20 FT)	SB-7 (14-16 FT)	SB-7 (16-20 FT)	SB-8 (4-6 FT)	SB-8 (16-20 FT)
Lab Sample ID:	Standard	FA17292-2	FA17292-3	FA17292-4	FA17292-5	FA17292-6	FA17292-7	FA17292-8	FA17292-23	FA17292-24	FA17292-21	FA17292-22	FA17292-19	FA17292-20	FA17292-17	FA17292-18
Date Sampled:	(mg/kg)	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Arsenic	20	0.74	0.72	1.3	<1.5	<0.53	<3.3	1.3	<4.3	2.4	<2.3	<2.5	<5.5	1.2	<1.2	0.92
Barium	1000	30	33	42.5	47	17.9	314	21.8	<86	48.2	52.7	64.5	<110	96.6	50.7	31.7
Cadmium	2	<0.19	<0.2	<0.40	<0.6	<0.21	<1.3	<0.71	<1.7	<0.42	<0.94	<0.99	<2.2	<0.24	<0.47	<0.35
Chromium	100	5.2	12.3	17.2	4.9	4.7	12.3	12.1	13.5	16	16	23.5	<5.5	11.8	21.2	8.5
Cobalt	20	<2.4	<2.5	<5.0	<7.4	<2.6	<17	<2.2	<21	<5.2	<12	21.5	<27	3	7.9	<4.4
Lead	75	6.9	8	34.8	8	6	22.6	7.6	8.9	12.3	11.4	19.6	<11	12.3	98.3	11.2
Mercury	0.5	<0.045	<0.045	<0.054	<0.042	<0.051	<0.072	<0.042	<0.048	<0.048	<0.049	<0.043	<0.056	<0.049	<0.050	<0.048
Nickle	50	<1.9	3.1	4.1	<6.0	<2.1	<13	2	<17	4.3	<9.4	<9.9	<22	4.2	6.8	<3.5
Selenium	2	<0.95	<1.0	<2.0	<3.0	<1.1	<6.7	<0.87	<8.6	<2.1	<4.7	<5.0	<11	<1.2	<2.4	<1.8
Silver	2	<0.47	<0.50	<0.99	<1.5	<0.53	<3.3	<0.44	<4.3	<1.0	<2.3	<2.5	<5.5	<0.60	<1.2	<0.89

Notes:
mg/kg: milligrams per kilogram
Bold: Values in bold exceed the Labora
Shaded: Values which are shaded exce
Applicable Standard: Concentration val
Constituents with no reported RRS val
E: Indicates value exceeds calibration r
J: Indicates an estimated value
B: Indicates analyte found in associatex
N: Indicates presumptive evidence of a
a: Dilution required due to matrix interfe
b: Elevated reporting limits due to matri
c: Outside control limits due to dilution.

TABLE 3
SOIL ANALYTICAL RESULTS

Metals
Results reported in mg/kg

LaGrange WWTP
3102 Whiteville Road (Highway
LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	SB-9 (4-6 FT)	SB-9 (16-20 FT)	SB-10 (8-10 FT)	SAB-10 (16-20 FT)	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	MW-1(6-8ft)	MW-2(4-6ft)	MW-3(6-8ft)	MW-4(4-6ft)
Lab Sample ID:	(mg/kg)	FA17292-15	FA17292-16	FA17292-9	FA17292-10	FA17292-25	FA17292-26	FA17292-27	FA17292-28	FA17292-29	FA17292-30	FA17292-13	FA17292-14	FA17292-11	FA17292-12
Date Sampled:		8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Arsenic	20	1.3	<1.2	<2.6	<4.8	0.65	1.9	0.89	0.73	<1.4	<1.4	<1.1	<2.3	<1.2	0.57
Barium	1000	43.8	41.9	139	182	23.3	38	19.7	19.6	54.9	54.8	34.4	54.5	36.8	17.8
Cadmium	2	<0.45	<0.49	<1.0	<1.9	<0.20	<0.68	<0.15	<0.17	<0.58	<0.58	<0.46	<0.92	<0.48	<0.20
Chromium	100	19.3	10.1	19.7	26	5.6	32.7	12.1	13.4	12	12.8	9.3	9.2	13.5	13.9
Cobalt	20	<5.6	<6.1	<13	<24	8.9	<8.6	16.8	15.6	256	11	<5.7	<12	<6.0	3.4
Lead	75	10.5	7.3	14.1	15.1	8.8	14.1	4.7	4.3	8.7	8.7	12	12	7	5.6
Mercury	0.5	<0.052	<0.049	<0.046	<0.054	<0.048	<0.041	<0.040	<0.046	<0.039	<0.040	<0.045	<0.051	<0.046	<0.048
Nickle	50	<4.5	<4.9	<10	<19	<2.0	8.5	2.4	1.8	9.7	<5.8	<4.6	<9.2	<4.8	3
Selenium	2	<2.3	<2.4	<5.2	<9.7	<1.0	<3.4	<10.75	<0.87	<2.9	<2.9	<2.3	<4.6	<2.4	<1.0
Silver	2	<1.1	<1.2	<2.6	<4.8	<0.50	<1.7	<0.37	<0.44	<1.4	<1.4	<1.1	<2.3	<1.2	<0.51

Notes:

mg/kg: milligrams per kilogram

Bold: Values in bold exceed the Labora

Shaded: Values which are shaded exct

Applicable Standard: Concentration val

Constituents with no reported RRS valt

E: Indicates value exceeds calibration r

J: Indicates an estimated value

B: Indicates analyte found in associater

N: Indicates presumptive evidence of a

a: Dilution required due to matrix interfe

b: Elevated reporting limits due to matri

c: Outside control limits due to dilution.

**TABLE 4
SUMMARY OF LIQUID LEVEL GAUGING DATA**

LaGrange WWTP
3102 Whiteville Road (Highway 219)
LaGrange, Troup County, Georgia

Well	Date Measured	Top of Casing Elevation (ft)	Screen Interval (ft)	Depth to NAPL from TOC (ft)	Depth to Water from TOC (ft)	Free Product Thickness (ft)	Corrected Groundwater Elevation (ft)
MW-1	08/15/14	100.00	2.0-10.0	--	5.82	0.00	94.18
	05/27/15			--	6.32	0.00	93.68
MW-2	08/15/14	101.60	2.0-10.0*	--	10.20	0.00	91.40
	05/27/15			--	10.71	0.00	90.89
MW-3	08/15/14	100.38	2.0-10.0	--	8.52	0.00	91.86
	05/27/15			--	9.01	0.00	91.37
MW-4	08/15/14	96.76	2.0-10.0	--	6.09	0.00	90.67
	05/27/15			--	6.61	0.00	90.15
Sludge Pond Inlet Pipe	05/27/15	94.52	NA	--	1.00	0.00	93.52
Creek Discharge Pipe	05/27/15	90.84	NA	--	0.80	0.00	90.04

Notes:

TOC: Top of casing

ft: feet

* Total depth to be verified during the next sampling event.

MW-2 depth to groundwater reported below the bottom of well screen interval.

Inlet and discharge pipe elevations are relative to the top of the pipe casing.

Inlet and discharge pipe water readings are surface water elevation at time of measurement.

Monitoring well top of casing and inlet/discharge pipe elevations resurveyed on May 27, 2015, utilizing MW-1 as benchmark.

TABLE 5
GROUNDWATER ANALYTICAL RESULTS

Volatile Organic Compounds
 Results reported in µg/L

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard µg/L	W-1	W-2	W-3	W-4	MW-1	MW-2	MW-3	MW-4	WW Influent	MW-1	MW-2	MW-3	MW-4
Lab Sample ID:		FA14532-18	FA14532-19	FA14532-20	FA14532-21	FA17490-1	FA17490-2	FA17490-3	FA17490-4	FA-17720-1	FA-24748-1	FA-24748-2	FA-24748-3	FA-24748-4
Date Sampled:		4/25/2014	4/25/2014	4/25/2014	4/25/2014	8/15/2014	5/15/2014	8/15/2014	8/15/2014	8/25/2014	5/27/2015	5/27/2015	5/27/2015	5/27/2015
Vinyl chloride	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<10	<25
Vinyl Acetate	510	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<100	<250
m,p-Xylene	10,000	0.51J	0.62J	<2.0	0.48J	<2.0	0.72 J	<2.0	<2.0	<2.0	<2.0	<10	<20	<50
o-Xylene	10,000	0.50J	0.65J	0.35J	0.35J	<1.0	0.75 J	<1.0	<1.0	<1.0	<1.0	<5.0	<10	<25

Notes:
 µg/L: micrograms per liter
 Bold: Values in bold exceed the Laboratory detection limit
 Shaded: Values which are shaded exceed the Applicable Standard
 Applicable Standard: Concentration values obtained from Appendix III Table 1 of OCGA § 391-3-.19
 Constituents with no reported RRS value are evaluated to their laboratory detection limit.
 NA: Not Analyzed
 E: Indicates value exceeds calibration range
 J: Indicates an estimated value
 B: Indicates analyte found in associated method blank
 N: Indicates presumptive evidence of a compound
 U: Indicates value is less than the Method Detection Limit
 a: Sample treated with anti-foaming agent.
 b: Dilution required due to matrix interference.

TABLE 6
GROUNDWATER ANALYTICAL RESULTS

Semi-Volatile Organic Compounds
 Results reported in µg/L

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	W-1	W-2	W-3	W-4	MW-1	MW-2	MW-3	MW-4	WW Influent	MW-1	MW-2	MW-3	MW-4
		FA14532-18	FA14532-19	FA14532-20	FA14532-21	FA17490-1	FA17490-2	FA17490-3	FA17490-4	FA-17720-1	FA-24748-1	FA-24748-2	FA-24748-3	FA-24748-4
Lab Sample ID:	µg/L	4/25/2014	4/25/2014	4/25/2014	4/25/2014	8/15/2014	5/15/2014	8/15/2014	8/15/2014	8/25/2014	5/27/2015	5/27/2015	5/27/2015	5/27/2015
Date Sampled:														
Phenanthrene	NE	<19	<19	<48	<48	<4.7	<48	<48	<96	<19	<5.0	<100	<20	<5.0
Pyrene	1,000	<19	<19	<48	<48	<4.7	<48	<48	<96	<19	<5.0	<100	<20	<5.0
Pyridine	40	<38	<38	<96	<95	<9.4	<95	<95	<190	<38	<10	<200	<40	<10
1,2,4-Trichlorobenzene	70	<19	<19	<48	<48	<4.7	<48	<48	<96	<19	<5.0	<100	<20	<5.0

Notes:

µg/L: micrograms per liter

Bold: Values in bold exceed the Laboratory detection limit

Shaded: Values which are shaded exceed the Applicable Standard

Applicable Standard: Concentration values obtained from Appendix III Table 1 of OCGA § 391-3-.19

Constituents with no reported RRS value are evaluated to their laboratory detection limit.

NA: Not Analyzed

E: Indicates value exceeds calibration range

J: Indicates an estimated value

B: Indicates analyte found in associated method blank

N: Indicates presumptive evidence of a compound

U: Indicates value is less than the Method Detection Limit

a: Sample treated with anti-foaming agent.

b: Dilution required due to matrix interference.

TABLE 7
GROUNDWATER ANALYTICAL RESULTS

Total and Dissolved Metals
 Results reported in µg/L

LaGrange WWTP
 3102 Whiteville Road (Highway 219)
 LaGrange, Troup County, Georgia

Client Sample ID:	Applicable Standard	W-1	W-2	W-3	W-4	MW-1	MW-2	MW-3	MW-4	MW-1	MW-2	MW-3	MW-4
Lab Sample ID:	µg/L	FA14532-18	FA14532-19	FA14532-20	FA14532-21	FA17490-1	FA17490-2	FA17490-3	FA17490-4	FA-24748-1	FA-24748-2	FA-24748-3	FA-24748-4
Date Sampled:		4/25/2014	4/25/2014	4/25/2014	4/25/2014	8/15/2014	5/15/2014	8/15/2014	8/15/2014	5/27/2015	5/27/2015	5/27/2015	5/27/2015
Arsenic Total	10	<10	<10	<10	<10	<10	<10	<10	<10	1.3 U	9.3 J	2.1 J	3.8 J
Barium Total	2,000	<200	<200	204	<200	<200	755	209	503	70.7 J	807	67.2 J	186 J
Cadmium Total	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	0.20 U	0.20 U	0.20 U	0.20 U
Chromium Total	100	<10	<10	11.4	24.9	<10	<10	<10	<10	1.0 U	11.5	1.6 J	11.4
Cobalt Total	NE	<50	<50	60.1	<50	<50	109	109	388	NA	NA	NA	NA
Lead Total	15	<5.0	5.2	<5.0	76.2	17.8	8.4	<5.0	<5.0	1.7 J	15.9	2.2 J	9.3
Mercury Total	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.030 U	0.030 U	0.03 U	0.063 J
Nickle Total	100	<10	<10	<10	<10	<40	<40	<40	<40	NA	NA	NA	NA
Selenium Total	50	<10	<10	<10	<10	<10	<10	<10	<10	2.9 U	6.5 J	6.4J	7.3 J
Silver Total	100	NA	NA	NA	NA	<10	<10	<10	<10	0.70 U	0.70 U	0.70 U	0.80 J
Arsenic Dissolved	10	NA	NA	NA	NA	<10	<10	<10	<10	1.3 U	3.4 J	1.3 U	1.3 U
Barium Dissolved	2,000	NA	NA	NA	NA	<200	755	<200	527	61.0 J	599	30.4 J	112 J
Cadmium Dissolved	5	NA	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	0.20 U	0.20 U	0.20 U	0.20 U
Chromium Dissolved	100	NA	NA	NA	NA	<10	<10	<10	<10	1.0 U	2.3 J	1.2 J	4.2 J
Cobalt Dissolved	NE	NA	NA	NA	NA	<50	108	102	408	NA	NA	NA	NA
Lead Dissolved	15	NA	NA	NA	NA	19.2	8.9	<5.0	<5.0	1.1 U	1.4 J	1.4 J	2.2 J
Mercury Dissolved	2	NA	NA	NA	NA	<0.50	<0.50	<0.50	<0.50	0.030 U	0.030 U	0.030 U	0.030 U
Nickle Dissolved	100	NA	NA	NA	NA	<40	<40	<40	<40	NA	NA	NA	NA
Selenium Dissolved	50	NA	NA	NA	NA	<10	<40	<10	<20	3.6 J	7.7 J	4.8 J	15.1
Silver Dissolved	100	NA	NA	NA	NA	<10	<10	<10	<10	1.0 J	3.5 J	1.7 J	3.5 J

Notes:

µg/L: micrograms per liter

Bold: Values in bold exceed the Laboratory detection limit

Shaded: Values which are shaded exceed the Applicable Standard

Applicable Standard: Concentration values obtained from Appendix III Table 1 of OCGA § 391-3-.19

Constituents with no reported RRS value are evaluated to their laboratory detection limit.

NA: Not Analyzed

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N: Indicates presumptive evidence of a compound

U: Indicates value is less than the Method Detection Limit


a: Sample treated with anti-foaming agent.

b: Dilution required due to matrix interference.


ATTACHMENT A

VIRP Application and Checklist

Voluntary Investigation and Remediation Plan Application Form and Checklist

VRP APPLICANT INFORMATION					
COMPANY NAME	Pilot Travel Centers, LLC				
CONTACT PERSON/TITLE	Mr. Joey Cupp / Senior Environmental Manager				
ADDRESS	5508 Lonas Drive, Knoxville, Tennessee 37909				
PHONE	865-588-7488	FAX		E-MAIL	Joey.cupp@pilottravelcenters.com
GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP					
NAME	Kenneth J. Perignat, P.E.		GA PE/PG NUMBER	32249	
COMPANY	Environmental Compliance Services, Inc.				
ADDRESS	9874 Main Street, Suite 100, Woodstock, Georgia				
PHONE	770-926-8883	FAX	770-926-8454	E-MAIL	kperignat@ecsconsult.com
APPLICANT'S CERTIFICATION					
<p>In order to be considered a qualifying property for the VRP:</p> <p>(1) The property must have a release of regulated substances into the environment;</p> <p>(2) The property shall not be:</p> <p style="margin-left: 20px;">(A) Listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601.</p> <p style="margin-left: 20px;">(B) Currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or</p> <p style="margin-left: 20px;">(C) A facility required to have a permit under Code Section 12-8-66.</p> <p>(3) Qualifying the property under this part would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or similar authorization from the United States Environmental Protection Agency.</p> <p>(4) Any lien filed under subsection (e) of Code Section 12-8-96 or subsection (b) of Code Section 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to Code Section 12-8-94 or Code Section 12-13-6.</p> <p>In order to be considered a participant under the VRP:</p> <p>(1) The participant must be the property owner of the voluntary remediation property or have express permission to enter another's property to perform corrective action.</p> <p>(2) The participant must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director.</p> <p>I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.</p> <p>I also certify that this property is eligible for the Voluntary Remediation Program (VRP) as defined in Code Section 12-8-105 and I am eligible as a participant as defined in Code Section 12-8-106.</p>					
APPLICANT'S SIGNATURE					
APPLICANT'S NAME/TITLE (PRINT)	Joey Cupp - Sr. Environmental Mgr.			DATE	7-15-15

QUALIFYING PROPERTY INFORMATION (For additional qualifying properties, please refer to the last page of application form)			
HAZARDOUS SITE INVENTORY INFORMATION (if applicable)			
HSI Number	10929	Date HSI Site listed	12/17/2014
HSI Facility Name	Pilot Wastewater Treatment Plant	NAICS CODE	
PROPERTY INFORMATION			
TAX PARCEL ID	0523 0000010	PROPERTY SIZE (ACRES)	4.24
PROPERTY ADDRESS	1960 Whitesville Road (Highway 219)		
CITY	Lagrange	COUNTY	Troup
STATE	Georgia	ZIPCODE	30240
LATITUDE (decimal format)	32.97278	LONGITUDE (decimal format)	85.02667
PROPERTY OWNER INFORMATION			
PROPERTY OWNER(S)	Pilot Travel Centers, LLC	PHONE #	865-588-7488
MAILING ADDRESS	5508 Lonas Road		
CITY	Knoxville	STATE/ZIPCODE	Tennessee 37909
ITEM #	DESCRIPTION OF REQUIREMENT	Location in VRP (i.e. pg., Table #, Figure #, etc.)	For EPD Comment Only (Leave Blank)
1.	\$5,000 APPLICATION FEE IN THE FORM OF A CHECK PAYABLE TO THE GEORGIA DEPARTMENT OF NATURAL RESOURCES. (PLEASE LIST CHECK DATE AND CHECK NUMBER IN COLUMN TITLED "LOCATION IN VRP." PLEASE DO NOT INCLUDE A SCANNED COPY OF CHECK IN ELECTRONIC COPY OF APPLICATION.)	Check Date: 07/27/15 Check No.: 150077	
2.	WARRANTY DEED(S) FOR QUALIFYING PROPERTY.	Attachment B.	
3.	TAX PLAT OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S).	Attachment C.	
4.	ONE (1) PAPER COPY AND TWO (2) COMPACT DISC (CD) COPIES OF THE VOLUNTARY REMEDIATION PLAN IN A SEARCHABLE PORTABLE DOCUMENT FORMAT (PDF).	Yes. Attached.	
5.	The VRP participant's initial plan and application must include, using all reasonably available current information to the extent known at the time of application, a graphic three-dimensional preliminary conceptual site model (CSM) including a preliminary remediation plan with a table of delineation standards, brief supporting text, charts, and figures (no more than 10 pages, total) that illustrates the site's surface and subsurface setting, the known or suspected source(s) of contamination, how contamination might move within the environment, the potential human health and ecological receptors, and the complete or incomplete exposure pathways that may exist at the site; the preliminary CSM must be updated as the investigation and remediation progresses and an up-to-date CSM must be included in each semi-annual status report submitted to the director by the participant; a PROJECTED MILESTONE SCHEDULE for investigation and remediation of the site, and after enrollment as a participant, must update the schedule in each semi-annual status report to the director describing implementation of the plan during the preceding period. A Gantt chart format is preferred for the	See attached VIRP Application package.	

	<p>during the preceding period. A Gantt chart format is preferred for the milestone schedule.</p> <p>The following four (4) generic milestones are required in all initial plans with the results reported in the participant's next applicable semi-annual reports to the director. The director may extend the time for or waive these or other milestones in the participant's plan where the director determines, based on a showing by the participant, that a longer time period is reasonably necessary:</p>		
5.a.	Within the first 12 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern on property where access is available at the time of enrollment;	Attachment D.	
5.b.	Within the first 24 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern extending onto property for which access was not available at the time of enrollment;	Attachment D.	
5.c.	Within 30 months after enrollment, the participant must update the site CSM to include vertical delineation, finalize the remediation plan and provide a preliminary cost estimate for implementation of remediation and associated continuing actions; and	Attachment D.	
5.d.	Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications.	Attachment D.	
6.	<p>SIGNED AND SEALED PE/PG CERTIFICATION AND SUPPORTING DOCUMENTATION:</p> <p>"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, <u>et seq.</u>). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.</p> <p>Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.</p> <p>The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."</p> <p><u>KENNETH J. PERIGNAT PE 32249 G/A</u> 7/23/2015 Printed Name and GA PE/PG Number Date</p> <p><u>[Signature]</u> Signature and Stamp</p> 		

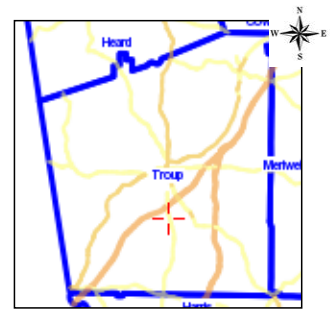
ATTACHMENT B

Parcel Map



Lakes/Rivers from US Census Dept, may not match parcels exactly 98 196 294 392 ft

WWTP	
Parcel: 0523 000010 Acres: 4.24	
Name:	PILOT TRAVEL CENTERS LLC
Site:	0 WHITESVILLE RD
Sale:	
Mail:	C/O INTAX INC P O BOX 54650 LEXINGTON, KY 40555



Troup County makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the last certified taxroll. All data is subject to change before the next certified taxroll.
Date printed: 05/15/14 : 10:11:17

ATTACHMENT C

Warranty Deed

Return to:
E. Drexel Meadors
Attorney at Law
P. O. Box 53
West Point, GA 31833

COPY

STATE OF GEORGIA
COUNTY OF TROUP

WARRANTY DEED

THIS INDENTURE, made and entered into this the 14th day of November, 2011, between INTERSTATE WASTEWATER SERVICES, INC., hereinafter in this Indenture known and designated as Grantor, and PILOT TRAVEL CENTERS LLC, a Delaware limited liability company with a mailing address of 5508 Lonas Drive, Knoxville, TN 37909, hereinafter in this Indenture known and designated as Grantee.

WITNESSETH: That Grantor, for and in consideration of Ten and No/100ths Dollars (\$10.00) and other good and valuable consideration to Grantor in hand paid, at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, has Granted, Bargained, Sold, Conveyed and Confirmed, and by these presents does Grant, Bargain, Sell, Convey and Confirm unto the said Grantee, the following described property, to-wit:

All that tract or parcel of land situate, lying and being in Land Lot 236 of the Sixth Land District of Troup County, Georgia, and more particularly described as follows:

Start at the intersection of the centerline of Long Cane Creek and the West right of way line of Georgia Highway No. 219 and run thence in a Northerly direction along the Western right of way of Georgia 219 Thirty-Five feet (35) to a point, being the Beginning Point of the property herein described; and run thence with a chord of South 84 degrees 20 minutes 13 seconds West 580.10 feet to a point; (said property line on the South being the center line of Long Cane Creek); run thence with a chord of North 30 degrees 15 minutes 07 seconds East 380.14 feet to a point marked by a iron pin; run thence North 27 degrees 56 minutes 51 seconds East 173.49 feet to a point marked by an iron pin; run

thence North 24 degrees 41 minutes 12 seconds East 54.30 feet to a point marked by an iron pin; run thence North 19 degrees 24 minutes 19 seconds East 59.20 feet to a point marked by an iron pin; run thence North 16 degrees 47 minutes 19 seconds East 57.02 feet to a point marked by an iron pin located on the Western boundary of Georgia 219; run thence South 13 degrees 20 minutes 10 seconds East 65.65 feet to a point marked by a concrete monument; run thence with a chord of South 22 degrees 39 minutes 40 seconds East 508.65 feet to a point marked by a concrete monument; run thence South 34 degrees 00 minutes 50 seconds East 61.70 feet to Point of Beginning. Said tract of land containing 4.2371 acres, more or less, and designated as B. P. Moore Estate as per plat of Clarence J. White, Jr., said plat recorded in Plat Book 12, Page 45, Troup County, Records.

This deed is given subject to all easements and restrictions of record, if any.

This being the same property conveyed to Interstate Wastewater Services, Inc. by deed dated July 5, 2001, of record in Deed Book 951, Page 650, Troup County, Georgia records.

TO HAVE AND TO HOLD the said tract or parcel of land, with all and singular the rights, members and appurtenances thereof, to the same being, belonging or in anywise appertaining, to the only proper use, benefit and behoof of said Grantee forever in FEE SIMPLE.

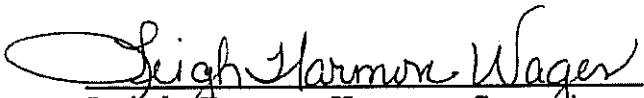
AND THE SAID GRANTOR will warrant and forever defend the right and title to the above described property unto the said Grantee against the claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor caused this deed to be signed and sealed by its undersigned officer, duly authorized in the premises, the day and year first above written.

INTERSTATE WASTEWATER SERVICES, INC.

By: 
Grady R. Harmon, President

Attest:


Leigh Harmon Wages, Secretary

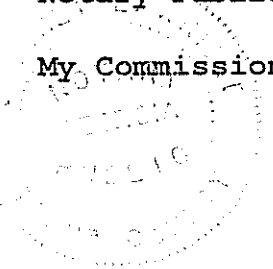
Signed, Sealed and Delivered

in the presence of:


Witness


Notary Public

My Commission expires: 9/29/2014



Direct future tax invoices to:

Pilot Travel Centers LLC
c/o InTax, Inc.
P. O. Box 54650
Lexington, KY 40555

This Instrument Prepared By:
E. Drexel Meadors
Attorney at Law
P. O. Box 53
West Point, GA 31833

STATE OF GEORGIA
COUNTY OF TROUP

BILL OF SALE

KNOW ALL MEN BY THESE PRESENTS: That Interstate Wastewater Services, Inc., a corporation, hereinafter "Seller", for and in consideration of Ten Dollars (\$10) and other good and valuable consideration, lawful money of the United States of America, in hand paid by Pilot Travel Centers, LLC, hereinafter "Purchaser", for the real property referred to herein, the receipt whereof is hereby acknowledged, does by these presents quitclaim and convey unto Purchaser, the following described personal property now located at 2240 Highway 219, in the City of LaGrange, County of Troup and State of Georgia, to-wit:

- 1- Waste Water Treatment Plant – In Ground Filtration Tank & Air Clarifier
- 2- Blower Shed Building and Contents
- 3- Chlorine Building and Contents
- 4- Monitor Building and Contents
- 5- In Ground Pump Stations
- 6- Pumps and Equipments
- 7- Fencing

Seller quitclaims all interest in the property described to Purchaser.

IN WITNESS WHEREOF, the Seller has hereunto caused this instrument to be executed by its undersigned officer this 14th day of November, 2011.

Interstate Wastewater Services, Inc.

By: Grady R. Harmon

Grady R. Harmon

Its: President

Signed, sealed and delivered

In the presence of:

[Signature]

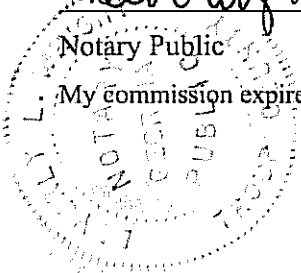
Witness

Beverly L. Wright

Notary Public

My commission expires:

9/29/2014



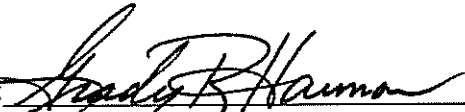
STATE OF GEORGIA
COUNTY OF TROUP

ASSIGNMENT OF NPDES PERMIT

KNOW ALL MEN BY THESE PRESENTS, that INTERSTATE WASTEWATER SERVICES, INC., Assignor, for and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, does hereby assign and transfer to PILOT TRAVEL CENTERS LLC, Assignee, all of Assignor's right, title and interest in and to Water Pollution Control Plant NPDES Permit No. GA0032565 Troup County, Georgia.

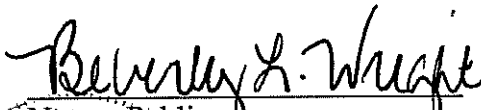
In witness whereof Assignor has caused this instrument to be executed this 15th day of November, 2011, by its undersigned officer duly authorized in the premises.

Interstate Wastewater Services, Inc.

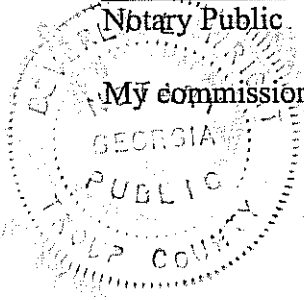
By: 
Grady R. Harmon,
President

Signed, sealed and delivered
in the presence of:


Witness


Notary Public.

My commission expires: 9/29/2014



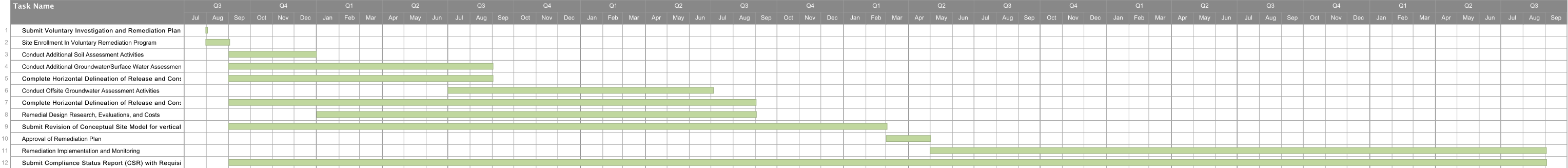
ATTACHMENT D

Conceptual Milestone Schedule

LaGrange Wastewater Treatment Plant



3102 Whitesville Road, LaGrange, Georgia
 Georgia Hazardous Site Inventory No. 10929
 Preliminary Schedule for Submittal with VIRP Application



ATTACHMENT E

EPA Technical Fact Sheet: 1,4-Dioxane



TECHNICAL FACT SHEET – 1,4-DIOXANE

At a Glance

- ❖ Flammable liquid and a fire hazard. Potentially explosive if exposed to light or air.
- ❖ Found at many federal facilities because of its widespread use as a stabilizer in certain chlorinated solvents, paint strippers, greases and waxes.
- ❖ Short-lived in the atmosphere, may leach readily from soil to groundwater, migrates rapidly in groundwater and is relatively resistant to biodegradation in the subsurface.
- ❖ Classified by the EPA as “likely to be carcinogenic to humans” by all routes of exposure.
- ❖ Short-term exposure may cause eye, nose and throat irritation; long-term exposure may cause kidney and liver damage.
- ❖ No federal maximum contaminant level (MCL) has been established for 1,4-dioxane in drinking water.
- ❖ Federal screening levels, state health-based drinking water guidance values and federal occupational exposure limits have been established.
- ❖ Modifications to existing sample preparation procedures may be required to achieve the increased sensitivity needed for detection of 1,4-dioxane.
- ❖ Common treatment technologies include advanced oxidation processes and bioremediation.

Introduction

This fact sheet, developed by the U.S. Environmental Protection Agency (EPA) Federal Facilities Restoration and Reuse Office (FFRRO), provides a summary of the contaminant 1,4-dioxane, including physical and chemical properties; environmental and health impacts; existing federal and state guidelines; detection and treatment methods; and additional sources of information. This fact sheet is intended for use by site managers who may address 1,4-dioxane at cleanup sites or in drinking water supplies and for those in a position to consider whether 1,4-dioxane should be added to the analytical suite for site investigations.

1,4-Dioxane is a likely human carcinogen and has been found in groundwater at sites throughout the United States. The physical and chemical properties and behavior of 1,4-dioxane create challenges for its characterization and treatment. It is highly mobile and has not been shown to readily biodegrade in the environment.

What is 1,4-dioxane?

- ❖ 1,4-Dioxane is a synthetic industrial chemical that is completely miscible in water (EPA 2006).
- ❖ Synonyms include dioxane, dioxan, p-dioxane, diethylene dioxide, diethylene oxide, diethylene ether and glycol ethylene ether (EPA 2006; Mohr 2001).
- ❖ 1,4-Dioxane is unstable at elevated temperatures and pressures and may form explosive mixtures with prolonged exposure to light or air (DHHS 2011; HSDB 2011).
- ❖ 1,4-Dioxane is a likely contaminant at many sites contaminated with certain chlorinated solvents (particularly 1,1,1-trichloroethane [TCA]) because of its widespread use as a stabilizer for chlorinated solvents (EPA 2013a; Mohr 2001)
- ❖ It is used as: a stabilizer for chlorinated solvents such as TCA; a solvent for impregnating cellulose acetate membrane filters; a wetting and dispersing agent in textile processes; and a laboratory cryoscopic solvent for molecular mass determinations (ATSDR 2012; DHHS 2011; EPA 2006).
- ❖ It is used in many products, including paint strippers, dyes, greases, varnishes and waxes. 1,4-Dioxane is also found as an impurity in antifreeze and aircraft deicing fluids and in some consumer products (deodorants, shampoos and cosmetics) (ATSDR 2012; EPA 2006; Mohr 2001).

Disclaimer: The U.S. EPA prepared this fact sheet from publically-available sources; additional information can be obtained from the source documents. This fact sheet is not intended to be used as a primary source of information and is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

What is 1,4-dioxane? (continued)

- ❖ 1,4-Dioxane is used as a purifying agent in the manufacture of pharmaceuticals and is a by-product in the manufacture of polyethylene terephthalate (PET) plastic (Mohr 2001).
- ❖ Traces of 1,4-dioxane may be present in some food supplements, food containing residues from packaging adhesives or on food crops treated with pesticides that contain 1,4-dioxane as a solvent or inert ingredient (ATSDR 2012; DHHS 2011).

Exhibit 1: Physical and Chemical Properties of 1,4-Dioxane
(ATSDR 2012; Howard 1990; HSDB 2011)

Property	Value
Chemical Abstracts Service (CAS) Number	123-91-1
Physical Description (physical state at room temperature)	Clear, flammable liquid with a faint, pleasant odor
Molecular weight (g/mol)	88.11
Water solubility	Miscible
Melting point (°C)	11.8
Boiling point (°C) at 760 mm Hg	101.1 °C
Vapor pressure at 25°C (mm Hg)	38.1
Specific gravity	1.033
Octanol-water partition coefficient (log K_{ow})	-0.27
Organic carbon partition coefficient (log K_{oc})	1.23
Henry's law constant at 25 °C (atm·m ³ /mol)	4.80 X 10 ⁻⁶

Abbreviations: g/mol – grams per mole; °C – degrees Celsius; mm Hg – millimeters of mercury; atm·m³/mol – atmosphere-cubic meters per mole.

What are the environmental impacts of 1,4-dioxane?

- ❖ 1,4-Dioxane is released into the environment during its production, the processing of other chemicals, its use and its generation as an impurity during the manufacture of some consumer products. It is typically found at some solvent release sites and PET manufacturing facilities (ATSDR 2012; Mohr 2001).
- ❖ It is short-lived in the atmosphere, with an estimated 1- to 3-day half-life as a result of its reaction with photochemically produced hydroxyl radicals (ATSDR 2012; DHHS 2011). Breakdown products include aldehydes and ketones (Graedel 1986).
- ❖ It may migrate rapidly in groundwater, ahead of other contaminants and does not volatilize rapidly from surface water bodies (DHHS 2011; EPA 2006).
- ❖ Migration to groundwater is weakly retarded by sorption of 1,4-dioxane to soil particles; it is expected to move rapidly from soil to groundwater (EPA 2006; ATSDR 2012).
- ❖ It is relatively resistant to biodegradation in water and soil and does not bioconcentrate in the food chain (ATSDR 2012; Mohr 2001).
- ❖ As of 2007, 1,4-dioxane had been identified at more than 31 sites on the EPA National Priorities List (NPL); it may be present (but samples were not analyzed for it) at many other sites (HazDat 2007).

What are the routes of exposure and the health effects of 1,4-dioxane?

- ❖ Potential exposure could occur during production and use of 1,4-dioxane as a stabilizer or solvent (DHHS 2011).
- ❖ Exposure may occur through inhalation of vapors, ingestion of contaminated food and water or dermal contact (ATSDR 2012; DHHS 2011).
- ❖ Inhalation is the most common route of human exposure, and workers at industrial sites are at greatest risk of repeated inhalation exposure (ATSDR 2012; DHHS 2011).

What are the routes of exposure and the health effects of 1,4-dioxane? (continued)

- ❖ 1,4-Dioxane is readily adsorbed through the lungs and gastrointestinal tract. Some 1,4-dioxane may also pass through the skin, but studies indicate that much of it will evaporate before it is absorbed. Distribution is rapid and uniform in the lung, liver, kidney, spleen, colon and skeletal muscle tissue (ATSDR 2012).
- ❖ Short-term exposure to high levels of 1,4-dioxane may result in nausea, drowsiness, headache, and irritation of the eyes, nose and throat (ATSDR 2012; EPA 2013b; NIOSH 2010).
- ❖ Chronic exposure may result in dermatitis, eczema, drying and cracking of skin and liver and kidney damage (ATSDR 2012; HSDB 2011).
- ❖ 1,4-Dioxane is weakly genotoxic and reproductive effects in humans are unknown; however, a developmental study on rats indicated that 1,4-dioxane may be slightly toxic to the developing fetus (ATSDR 2012; Giavini and others 1985).
- ❖ Animal studies showed increased incidences of nasal cavity, liver and gall bladder tumors after exposure to 1,4-dioxane (DHHS 2011; EPA IRIS 2013).
- ❖ EPA has classified 1,4-dioxane as “likely to be carcinogenic to humans” by all routes of exposure (EPA IRIS 2013).
- ❖ The U.S. Department of Health and Human Services states that 1,4-dioxane is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals (DHHS 2011).
- ❖ The American Conference of Governmental Industrial Hygienists (ACGIH) has classified 1,4-dioxane as a Group A3 carcinogen — confirmed animal carcinogen with unknown relevance to humans (ACGIH 2011).
- ❖ The National Institute for Occupational Safety and Health (NIOSH) considers 1,4-dioxane a potential occupational carcinogen (NIOSH 2010).

Are there any federal and state guidelines and health standards for 1,4-dioxane?

- ❖ Federal and State Standards and Guidelines:
 - EPA’s Integrated Risk Information System (IRIS) database includes a chronic oral reference dose (RfD) of 0.03 milligrams per kilogram per day (mg/kg/day) based on liver and kidney toxicity in animals and a chronic inhalation reference dose (RfC) of 0.03 milligrams per cubic meter (mg/m³) based on atrophy and respiratory metaplasia inside the nasal cavity of animals (EPA IRIS 2013).
 - The Agency for Toxic Substances and Disease Registry (ATSDR) has established minimal risk levels (MRLs) for inhalation exposure to 1,4-dioxane : 2 parts per million (ppm) for acute-duration (14 days or less) inhalation exposure; 0.2 ppm for intermediate-duration (15 to 364 days) inhalation exposure; and 0.03 ppm for chronic-duration (365 days or more) inhalation exposure (ATSDR 2012).
 - Oral exposure MRLs have been identified as 5 mg/kg/day for acute-duration oral exposure; 0.5 mg/kg/day for intermediate-duration oral exposure; and 0.1 mg/kg/day for chronic-duration oral exposure (ATSDR 2012).
 - The cancer risk assessment for 1,4-dioxane is based on an oral slope factor of 0.1 mg/kg/day and the drinking water unit risk is 2.9×10^{-6} micrograms per liter (µg/L) (EPA IRIS 2013).
 - EPA risk assessments indicate that the drinking water concentration representing a 1×10^{-6} cancer risk level for 1,4-dioxane is 0.35 µg/L (EPA IRIS 2013).
 - 1,4-Dioxane may be regulated as hazardous waste when waste is generated through use as a solvent stabilizer (EPA 1996b).
 - No federal maximum contaminant level (MCL) for drinking water has been established; however, an MCL is not necessary to determine a cleanup level (EPA 2012).
 - 1,4-Dioxane was included on the third drinking water contaminant candidate list, which is a list of unregulated contaminants that are known to, or anticipated to, occur in public water systems and may require regulation under the Safe Drinking Water Act (EPA 2009).

Are there any federal and state guidelines and health standards for 1,4-dioxane? (continued)

- ❖ Federal and State Standards and Guidelines (continued):
 - The EPA has established drinking water health advisories for 1,4-dioxane, which are drinking water-specific risk level concentrations for cancer (10^{-4} cancer risk) and concentrations of drinking water contaminants at which noncancer adverse health effects are not anticipated to occur over specific exposure durations. The EPA established a 1-day health advisory of 4.0 milligrams per liter (mg/L) and a 10-day health advisory of 0.4 mg/L for 1,4-dioxane in drinking water for a 10-kilogram child. EPA also established a lifetime health advisory of 0.2 mg/L for 1,4-dioxane in drinking water (EPA 2012).
 - The EPA's drinking water equivalent level for 1,4-dioxane is 1 mg/L (EPA 2012).
 - EPA has calculated a screening level of 0.67 µg/L for 1,4-dioxane in tap water, based on a 1 in 10^{-6} lifetime excess cancer risk (EPA 2013c).^{1, 2}
 - EPA has calculated a residential soil screening level (SSL) of 4.9 milligrams per kilogram (mg/kg) and an industrial SSL of 17 mg/kg. The soil-to-groundwater risk-based SSL is 1.4×10^{-4} mg/kg (EPA 2013c).
 - EPA has also calculated a residential air screening level of 0.49 micrograms per cubic meter (µg/m³) and an industrial air screening level of 2.5 µg/m³ (EPA 2013c).
- ❖ Workplace Exposure Limits:
 - The Occupational Safety and Health Administration set a general industry permissible exposure limit of 360 mg/m³ or 100 ppm based on a time-weighted average (TWA) over an 8-hour workday for airborne exposure to 1,4-dioxane (OSHA 2013).
 - The ACGIH set a threshold limit value of 72 mg/m³ or 20 ppm based on a TWA over an 8-hour workday for airborne exposure to 1,4-dioxane (ACGIH 2011).
 - The NIOSH has set a ceiling recommended exposure limit of 3.6 mg/m³ or 1 ppm based on a 30-minute airborne exposure to 1,4-dioxane (NIOSH 2010).
 - NIOSH also has established an immediately dangerous to life or health concentration of 500 ppm for 1,4-dioxane (NIOSH 2010).
- ❖ Other State and Federal Standards and Guidelines:
 - Various states have established drinking water and groundwater guidelines, including the following:
 - Colorado has established an interim groundwater quality cleanup standard of 0.35 µg/L (CDPHE 2012);
 - California has established a notification level of 1 µg/L for drinking water (CDPH 2011);
 - New Hampshire has established a reporting limit of 0.25 µg/L for all public water supplies (NH DES 2011); and
 - Massachusetts has established a drinking water guideline level of 0.3 µg/L (Mass DEP 2012).
 - The Food and Drug Administration set 10 mg/kg as the limit for 1,4-dioxane in glycerides and polyglycerides for use in products such as dietary supplements. FDA also surveys raw material and products contaminated with 1,4-dioxane (FDA 2006).
 - 1,4-Dioxane is listed as a hazardous air pollutant under the Clean Air Act (CAA) (CAA 1990).
 - A reportable quantity of 100 pounds has been established under the Comprehensive Environmental Response, Compensation, and Liability Act (EPA 2011).

¹ Screening Levels are developed using risk assessment guidance from the EPA Superfund program. These risk-based concentrations are derived from standardized equations combining exposure information assumptions with EPA toxicity data. These calculated screening levels are generic and not enforceable cleanup standards but provide a useful gauge of relative toxicity.

² Tap water screening levels differ from the IRIS drinking water concentrations because the tap water screening levels account for dermal, inhalation and ingestion exposure routes; age-adjust the intake rates for children and adults based on body weight; and time-adjust for exposure duration or days per year. The IRIS drinking water concentrations consider only the ingestion route, account only for adult-intake rates and do not time-adjust for exposure duration or days per year.

What detection and site characterization methods are available for 1,4-dioxane?

- ❖ As a result of the limitations in the analytical methods to detect 1,4-dioxane, it has been difficult to identify its occurrence in the environment. The miscibility of 1,4-dioxane in water causes poor purging efficiency and results in high detection limits (ATSDR 2012; EPA 2006).
- ❖ Conventional analytical methods can detect 1,4-dioxane only at concentrations 100 times greater than the concentrations of volatile organic compounds (EPA 2006; Mohr 2001).
- ❖ Modifications of existing analytical methods and their sample preparation procedures may be needed to achieve lower detection limits for 1,4-dioxane (EPA 2006; Mohr 2001).
- ❖ High-temperature sample preparation techniques improve the recovery of 1,4-dioxane. These techniques include purging at elevated temperature (EPA SW-846 Method 5030); equilibrium headspace analysis (EPA SW-846 Method 5021); vacuum distillation (EPA SW-846 Method 8261); and azeotropic distillation (EPA SW-846 Method 5031) (EPA 2006).
- ❖ The presence of 1,4-dioxane may be expected at sites with extensive TCA contamination; therefore, some experts recommend that groundwater samples be analyzed for 1,4-dioxane where TCA is a known contaminant (Mohr 2001).
- ❖ NIOSH Method 1602 uses gas chromatography – flame ionization detection (GC-FID) to determine the concentration of 1,4-dioxane in air. The detection limit is 0.01 milligram per sample (ATSDR 2012; NIOSH 2010).
- ❖ EPA SW-846 Method 8015D uses gas chromatography (GC) to determine the concentration of 1,4-dioxane in environmental samples. Samples may be introduced into the GC column by a variety of techniques including the injection of the concentrate from azeotropic distillation (EPA SW-846 Method 5031). The detection limits for 1,4-dioxane in aqueous matrices by azeotropic microdistillation are 12 µg/L (reagent water), 15 µg/L (groundwater) and 16 µg/L (leachate) (EPA 2003).
- ❖ EPA SW-846 Method 8260B detects 1,4-dioxane in a variety of solid waste matrices using GC and mass spectrometry (MS). The detection limit depends on the instrument and choice of sample preparation method (ATSDR 2012; EPA 1996a).
- ❖ A laboratory study is underway to develop a passive flux meter (PFM) approach to enhance the capture of 1,4-dioxane in the PFM sorbent to improve accuracy. The selected PFM approach will be field tested at 1,4-dioxane contaminated sites. The anticipated projection completion date is 2014 (DoD SERDP 2013b).
- ❖ EPA Method 1624 uses isotopic dilution gas chromatography – mass spectrometry (GC-MS) to detect 1,4-dioxane in water, soil and municipal sludges. The detection limit for this method is 10 µg/L (ATSDR 2012; EPA 2001b).
- ❖ EPA SW-846 Method 8270 uses liquid-liquid extraction and isotope dilution by capillary column GC-MS. This method is often modified for the detection of low levels of 1,4-dioxane in water (EPA 2007, 2013a)
- ❖ GC-MS detection methods using solid phase extraction followed by desorption with an organic solvent have been developed to remove 1,4-dioxane from the aqueous phase. Detection limits as low as 0.024 µg/L have been achieved by passing the aqueous sample through an activated carbon column, following by elution with acetone-dichloromethane (ATSDR 2012; Kadokami and others 1990).
- ❖ EPA Method 522 uses solid phase extraction and GC/MS with selected ion monitoring for the detection of 1,4-dioxane in drinking water with detection limits ranging from 0.02 to 0.026 µg/L (EPA 2008).

What technologies are being used to treat 1,4-dioxane?

- ❖ Pump-and-treat remediation can treat dissolved 1,4-dioxane in groundwater and control groundwater plume migration, but requires ex situ treatment tailored for the unique properties of 1,4-dioxane (such as, a low octanol-water partition coefficient that makes 1,4-dioxane hydrophilic) (EPA 2006; Kiker and others 2010).
- ❖ Commercially available advanced oxidation processes using hydrogen peroxide with ultraviolet light or ozone is used to treat 1,4-dioxane in wastewater (Asano and others 2012; EPA 2006).
- ❖ A study is under way to investigate facilitated-transport enabled in situ chemical oxidation to treat 1,4-dioxane-contaminated source zones and groundwater plumes effectively. The technical approach consists of the co-injection of strong oxidants (such as ozone) with chemical agents that facilitate the transport of the oxidant (DoD SERDP 2013d).

What technologies are being used to treat 1,4-dioxane? (continued)

- ❖ Ex situ bioremediation using a fixed-film, moving-bed biological treatment system is also used to treat 1,4-dioxane in groundwater (EPA 2006).
- ❖ Phytoremediation is being explored as a means to remove the compound from shallow groundwater. Pilot-scale studies have demonstrated the ability of hybrid poplars to take up and effectively degrade or deactivate 1,4-dioxane (EPA 2001a, 2013a; Ferro and others 2013).
- ❖ Microbial degradation in engineered bioreactors has been documented under enhanced conditions or where selected strains of bacteria capable of degrading 1,4-dioxane are cultured, but the impact of the presence of chlorinated solvent co-contaminants on biodegradation of 1,4-dioxane needs to be further investigated (EPA 2006, 2013a; Mahendra and others 2013).
- ❖ Results from a 2012 laboratory study found 1,4-dioxane-transforming activity to be relatively common among monooxygenase-expressing bacteria; however, both TCA and 1,1-dichloroethene inhibited 1,4-dioxane degradation by bacterial isolates (DoD SERDP 2012).
- ❖ Several Department of Defense Strategic Environmental Research and Development Program (DoD SERDP) projects are under way to investigate 1,4-dioxane biodegradation in the presence of chlorinated solvents or metals. Laboratory studies will (1) identify microbial cultures as well as biogeochemistry, which generate desirable enzymatic activity for 1,4-dioxane biodegradation; (2) assess biodegradation by methane oxidizing bacteria in coupled anaerobic-aerobic zones; (3) and evaluate branched hydrocarbons as stimulants for the in situ cometabolic biodegradation of 1,4-dioxane and its associated co-contaminants (DoD SERDP 2013c, e and f).
- ❖ Photocatalysis has been shown to remove 1,4-dioxane in aqueous solutions. Laboratory studies documented that the surface plasmon resonance of gold nanoparticles on titanium dioxide (Au – TiO₂) promotes the photocatalytic degradation of 1,4-dioxane (Min and others 2009; Vescovi and others 2010).
- ❖ Other in-well combined treatment technologies being assessed include air sparging; soil vapor extraction (SVE); and dynamic subsurface groundwater circulation (Odah and others 2005).
- ❖ SVE is known to remove some 1,4-dioxane, but substantial residual contamination is usually left behind because of 1,4-dioxane's high solubility, which leads to preferential partitioning into pore water rather than vapor. The DoD SERDP is conducting a project to evaluate and demonstrate the efficacy of enhanced or extreme SVE, which uses a combination of increased air flow, sweeping with drier air, increased temperature, decreased infiltration and more focused vapor extraction to enhance 1,4-dioxane remediation in soils (DoD SERDP 2013a).

Where can I find more information about 1,4-dioxane?

- ❖ Asano, M., Kishimoto, N., Shimada, H., and Y. Ono. 2012. "Degradation of 1,4-Dioxane Using Ozone Oxidation with UV Irradiation (Ozone/UV) Treatment." *Journal of Environmental Science and Engineering*. Volume A (1). Pages 371 to 279.
- ❖ Agency for Toxic Substances and Disease Registry (ATSDR). 2012. "Toxicological Profile for 1,4-Dioxane." www.atsdr.cdc.gov/toxprofiles/tp187.pdf
- ❖ American Conference of Governmental Industrial Hygienists (ACGIH). 2011. "2011 Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents Biological Exposure Indices." Cincinnati, Ohio.
- ❖ California Department of Public Health (CDPH). 2011. "1,4-Dioxane." *Drinking Water Systems*. www.cdph.ca.gov/certlic/drinkingwater/Pages/1,4-dioxane.aspx
- ❖ Clean Air Act Amendments of 1990 (CAA). 1990. "Hazardous Air Pollutants". 42 USC § 7412.
- ❖ Colorado Department of Public Health and the Environment (CDPHE). 2012. "Notice of Public Rulemaking Hearing before the Colorado Water Quality Control Commission." Regulation No. 31 and No. 41. www.sos.state.co.us/CCR/Upload/NoticeOfRulemaking/ProposedRuleAttach2012-00387.PDF
- ❖ Ferro, A.M., Kennedy, J., and J.C. LaRue. 2013. "Phytoremediation of 1,4-Dioxane-Containing Recovered Groundwater." *International Journal of Phytoremediation*. Volume 15. Pages 911 to 923.
- ❖ Giavini, E., Vismara, C., and M.L Broccia. 1985. "Teratogenesis Study of Dioxane in Rats." *Toxicology Letters*. Volume 26 (1). Pages. 85 to 88.

Where can I find more information about 1,4-dioxane? (continued)

- ❖ Graedel, T.E. 1986. Atmospheric Chemical Compounds. New York, NY: Academic Press.
- ❖ Hazardous Substances Data Bank (HSDB). 2011. "1,4-Dioxane." <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
- ❖ HazDat. 2007. "1,4-Dioxane." HazDat Database: ATSDR's Hazardous Substance Release and Health Effects Database. Atlanta, GA: Agency for Toxic Substances and Disease Registry.
- ❖ Howard, P.H. 1990. Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Lewis Publishers, Inc., Chelsea, MI. Pages 216 to 221.
- ❖ Kadokami, K, Koga, M. and A. Otsuki. 1990. "Gas Chromatography/Mass Spectrometric Determination of Traces of Hydrophilic and Volatile Organic Compounds in Water after Preconcentration with Activated Carbon." Analytical Sciences. Volume 6(6). Pages 843 to 849.
- ❖ Kiker, J.H., Connolly, J.B., Murray, W.A., Pearson, S.C.; Reed, S.E., and R.J. Robert. 2010. "Ex-Situ Wellhead Treatment of 1,4-Dioxane Using Fenton's Reagent." Proceedings of the Annual International Conference on Soils, Sediments, Water and Energy. Volume 15, Article 18.
- ❖ Mahendra, S., Grostern, A. and L. Alvarez-Cohen. 2013. "The Impact of Chlorinated Solvent Co-Contaminants on the Biodegradation Kinetics of 1,4-Dioxane." Chemosphere. Volume 91 (1). Pages 88 to 92.
- ❖ Massachusetts Department of Environmental Protection (Mass DEP). 2012. "Standards and Guidelines for Contaminants in Massachusetts Drinking Waters." www.mass.gov/dep/water/dwstand.pdf
- ❖ Min, B.K., Heo, J.E., Youn, N.K., Joo, O.S., Lee, H., Kim, J.H., and H.S. Kim. 2009. "Tuning of the Photocatalytic 1,4-Dioxane Degradation with Surface Plasmon Resonance of Gold Nanoparticles on Titania." Catalysis Communications. Volume 10 (5). Pages 712 to 715.
- ❖ Mohr, T.K.G. 2001. "1,4-Dioxane and Other Solvent Stabilizers White Paper." Santa Clara Valley Water District of California. San Jose, California.
- ❖ National Institute for Occupational Safety and Health (NIOSH). 2010. "Dioxane." NIOSH Pocket Guide to Chemical Hazards. www.cdc.gov/niosh/npg/npgd0237.html
- ❖ New Hampshire Department of Environmental Services (NH DES). 2011 "Change in Reporting Limit for 1,4-Dioxane." <http://des.nh.gov/organization/divisions/waste/hwr/b/sss/hwrrp/documents/report-limits14dioxane.pdf>
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Where can I find more information about 1,4-dioxane? (continued)

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Additional information on 1,4-dioxane can be found at www.cluin.org/contaminantfocus/default.focus/sec/1,4-Dioxane/cat/Overview

Contact Information

If you have any questions or comments on this fact sheet, please contact: Mary Cooke, FFRRO, by phone at (703) 603-8712 or by email at cooke.maryt@epa.gov.