Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Sit
Harris County, Texas

International Paper Corporation

100021306

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List of Acronyms

AOC	-	Administrative Settlement Agreement and Order on Consent for Remedial Design
ARAR	-	Applicable or Relevant and Appropriate Requirements
ASTM	-	American Society for Testing and Materials
BHHRA	-	Baseline Human Health Risk Assessment
BMP	-	Best Management Practice
BOD	-	Biological Oxygen Demand
^{137}Cs	-	Cesium-137
CFR	-	Code of Federal Regulations
CFS	-	Cubic Feet per Second
CME	-	Central Mine Equipment
COPC	-	Constituent of Potential Concern
CQA/CQP	-	Construction Quality Assurance/Quality Control Plan
DQO	-	Data Quality Objective
DWA	-	Depth-Weighted Average
EPA	-	Environmental Protection Agency
ERP	-	Emergency Response Plan
FSP	-	Field Sampling Plan
ft bgs	-	Feet Below Ground Surface
F_y	-	Yield
GHD	-	GHD Services Inc.
gpm	-	Gallons per Minute
GPS	-	Global Positioning System
HASP	-	Health and Safety Plan
I-10	-	Interstate Highway 10
IBC	-	Intermediate Bulk Containers
ICIAP	-	Institutional Controls Implementation and Assurance Plan
IPC	-	International Paper Company
ML	-	Minimum Level
mph	-	Miles per Hour
NAVD88	-	North American Vertical Datum of 1988
ng/kg	-	Nanograms per Kilogram
PCBs	-	Polychlorinated Biphenyls
pcf	-	Pounds per Cubic Foot
PDI	-	Pre-Design Investigation
PDI-1	-	First Phase Pre-Design Investigation
PDI-2	-	Second Phase Pre-Design Investigation
POTW	-	Publicly-Operated Treatment Works
QAPP	-	Quality Assurance Project Plan
RA	-	Remedial Action
RAO	-	Remedial Action Objective
RCRA	-	Resource Conservation and Recovery Act
RD	-	Remedial Design
RDWP	-	Remedial Design Work Plan
RI	-	Remedial Investigation
ROD	-	Record of Decision

SM	-	Standard Method
SOW	-	Statement of Work
SPT	-	Standard Penetration Test
SVOC	-	Semivolatile Organic Compound
SWMP	-	Site Wide Monitoring Plan
SWPPP	-	Stormwater Pollution Prevention Plan
TAC	-	Texas Administrative Code
TCDD	-	2,3,7,8-tetrachlorinated dibenzo-p-dioxin
TCEQ	-	Texas Commission on Environmental Quality
TCLP	-	Toxicity Characteristic Leaching Procedure
TCRA	-	Time Critical Removal Action
$TEQ_{DF,M}$	-	TCDD Toxicity Equivalent for Mammals
TOC	-	Total Organic Carbon
TODP	-	Transportation and Off-Site Disposal Plan
TPH	-	Total Petroleum Hydrocarbons
TSS	-	Total Suspended Solids
TSWP	-	Treatability Study Work Plan
TSWQS	-	Texas Surface Water Quality Standard
TWG	-	Technical Working Group
USACE	-	United States Army Corps of Engineers
UU	-	Unconsolidated Undrained
VOC	-	Volatile Organic Compound
µm	-	Micron

1. Introduction

GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC), submits to the United States Environmental Protection Agency (EPA) this Preliminary 30% Remedial Design (RD) for the Southern Impoundment (Southern Impoundment 30% RD) of the San Jacinto River Waste Pits Site in Harris County, Texas (Site). This Southern Impoundment 30% RD was prepared pursuant to the requirements of the Administrative Settlement Agreement and Order on Consent for Remedial Design (AOC), Docket No. 06 02 18, with an effective date of April 11, 2018 (EPA, 2018a). The AOC includes a Statement of Work (SOW) under which a Preliminary 30% RD for the Southern Impoundment is to be submitted to the EPA.

1.1 Background

The Site is located in Harris County, Texas, east of the City of Houston, between two unincorporated areas known as Channelview and Highlands. The Northern Impoundment is located immediately north of the Interstate Highway 10 (I-10) bridge over the San Jacinto River. The Southern Impoundment is approximately 20 acres in size and is located on a small peninsula that extends south of I-10. A vicinity map is shown on Figure 1, the Site plan is shown on Figure 2, and the Southern Impoundment is shown on Figure 3.

The Southern Impoundment consists of an impoundment built in the mid-1960s for disposal of solid and liquid pulp and paper mill material. The primary hazardous substances identified in soils within the Southern Impoundment are polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. Additional background information regarding the Southern Impoundment is contained in the *Remedial Investigation Report* (Integral and Anchor QEA, 2013b).

The remedy selected by the EPA for the Southern Impoundment is described in the *Record of Decision* (ROD) (EPA, 2017) as follows:

> This remedial action (RA) involves excavation and replacement of soil in the Southern Impoundment that is above the clean-up level. Soil would be removed within these areas to a depth of 10 feet below grade. Implementation of this RA would require dewatering (groundwater lowering) to allow excavation of impacted soil in relatively dry conditions and may need to be timed to try to avoid high water and periods when storms are most likely. Excavated soil would be further dewatered, as necessary, and potentially treated to eliminate free liquids prior to transporting it for disposal. Effluent from excavation and subsequent dewatering would need to be handled appropriately, potentially including treatment prior to disposal. Excavated soil would be disposed of at an existing permitted landfill, the excavation would be backfilled with imported soil, and vegetation would be re-established. An existing building (an elevated frame structure) and a concrete slab would need to be demolished and removed prior to excavating the underlying soil. These features would be replaced as necessary.

The Remedial Action Objectives (RAOs) for the Site, as identified in the ROD, include:

RAO 1: Prevent releases of dioxins and furans above clean-up levels from the former waste impoundments to sediments and surface water of the San Jacinto River.

RAO 2: Reduce human exposure to dioxins and furans from ingestion of fish by remediating sediments to appropriate clean-up levels.

RAO 3: Reduce human exposure to dioxins and furans from direct contact with or ingestion of paper mill waste, soil, and sediment by remediating affected media to appropriate clean-up levels.

RAO 4: Reduce exposures of benthic invertebrates, birds, and mammals to paper mill waste derived dioxins and furans by remediating affected media to appropriate clean-up levels.

The risk-based clean-up level for the Southern Impoundment set forth in the ROD is listed below:

- Dioxin in paper mill waste material and soil in the Southern Impoundment - 240 nanograms per kilogram (ng/kg) (Southern Impoundment construction worker).

The exposure of a future construction worker to constituents of potential concern (COPCs) in surface and subsurface soils, as detailed in the *Baseline Human Health Risk Assessment* (BHHRA; Anchor QEA and Integral, 2013a), was considered in selecting a risk-based clean-up standard for the Southern Impoundment. It used a depth-weighted average (DWA) of the COPCs because a hypothetical future construction worker is assumed to be exposed to a mixture consisting of all soils within a 10-foot (ft) soil depth, and not solely to a given soil horizon for the duration of exposure. In communications and discussions with the EPA, the EPA has confirmed that the clean-up level of 240 ng/kg 2,3,7,8-tetrachlorinated dibenzo-*p*-dioxin (TCDD) toxicity equivalents for mammals ($TEQ_{DF,M}$) outlined in the ROD is a DWA over the upper 10 feet of soil.

1.2 Remedial Design Approach

The RD process, as provided for in the AOC, includes the use of a Technical Working Group (TWG) to provide technical expertise in the development and evaluation of the RD plans. The TWG has considered the pre-design investigations (PDIs), treatability, and Southern Impoundment RD elements represented in this document. The TWG consists of representatives from the EPA, Texas Commission on Environmental Quality (TCEQ), United States Army Corps of Engineers (USACE), GHD and other technical subject matter experts, as needed. The TWG has met a total of nine times since the RD was initiated including on April 30, 2018, May 14 through 15, 2018, May 30, 2018, June 13, 2018, May 3, 2019, December 17, 2019, January 27 through 28, 2020, February 19, 2020, and March 25, 2020.

In addition, GHD and the EPA conduct weekly meetings to discuss the ongoing design progress, key technical items, and decisions associated with these items.

A summary of the deliverables associated with the RD to date are listed below.

- On September 10, 2018, the *Draft Remedial Design Work Plan* (RDWP, Integral and Anchor QEA, 2018c) was submitted to the EPA and outlined plans for implementing the RD activities identified in the SOW. The EPA provided comments on the Draft RDWP on October 24, 2018. The *Remedial Design Work Plan* (Integral and Anchor QEA, 2018e) was submitted to the EPA on December 24, 2018.
- On June 8, 2018, the *Draft First Phase Pre-Design Investigation Work Plan* (Integral and Anchor QEA, 2018a) was submitted to the EPA. The EPA provided comments and the *First Phase Pre-Design Investigation Work Plan* (Integral and Anchor QEA, 2018b) was submitted to the

EPA on August 24, 2018. It was approved by the EPA on September 12, 2018 (EPA, 2018b). An Addendum to the First Phase Pre-Design Investigation Work Plan (Integral and Anchor QEA, 2018d) was submitted on October 18, 2018.

- On December 7, 2018, a letter was submitted to the EPA (GHD, 2018) requesting a 48-day extension to the deadline for submittal of the *Draft Second Phase Pre-Design Investigation Work Plan* to allow time for the results from the First Phase Pre-Design Investigation (PDI-1) to be received and incorporated. This extension request was approved by the EPA on December 18, 2018 (EPA, 2018c), effectively extending the date for all subsequent RD submittals.
- On February 11, 2019, the *Draft Second Phase Pre-Design Investigation Work Plan* (GHD, 2019a) was submitted to the EPA. The EPA provided comments to the work plan on April 18, 2019 (EPA, 2019a). On June 3, 2019, the *Final Second Phase Pre-Design Investigation Work Plan* (GHD, 2019d) was submitted to the EPA and approved by the EPA in written correspondence dated August 8, 2019 (EPA, 2019c).
- On February 11, 2019, the *Draft Treatability Study Work Plan* (TSWP; GHD, 2019b) was submitted to the EPA. The EPA provided comments to the TSWP on April 18, 2019 (EPA, 2019b). On May 20, 2019, the *Final Treatability Study Work Plan,* (GHD, 2019c) was submitted to the EPA and approved in written correspondence dated August 27, 2019 (EPA, 2019d).
- On September 27, 2019, a letter was submitted to the EPA (GHD, 2019e) requesting an extension to the deadlines for the Preliminary 30% RD for the Northern and Southern Impoundments in response to a force majeure event caused by Tropical Storm Imelda, which caused significant flooding at the Site and the surrounding area in September 2019 and delayed the completion of field work related to Second Phase PDI (PDI-2). In a letter dated October 30, 2019 (EPA, 2019f), the EPA approved a 24-day delay due to the force majeure event and an extension to the deadlines for submittal of the Preliminary 30% RD for both the Northern and Southern Impoundments.

1.3 Objective

The objective of this Report is to present a summary of the 30% RD for the Southern Impoundment. The report includes a summary of the results from PDI-1, PDI-2, and the ongoing Treatability Study. This Report also includes a description of the primary design elements for the selected remedy for the Southern Impoundment, including those related to soil removal, the design and installation of a bulkhead, and water treatment, and associated design drawings, specifications, and supplemental plans.

1.4 Document Organization and Supporting Deliverables

The remaining sections of this Report are organized as follows:

- Section 2 of this Report includes descriptions of the phased PDIs for the Southern Impoundment that were performed and a summary of the results and conclusions from these events.

- Section 3 of this Report includes a description of treatability studies for the Southern Impoundment and results.
- Section 4 of this Report addresses the Applicable or Relevant and Appropriate Requirements (ARARs) that may be applicable to the Southern Impoundment remedial action (RA) work.
- Section 5 of this Report details the design criteria assumptions that are the basis for will be used as part of the excavation, bulkhead installation, transportation and disposal, and water treatment processes elements of the Southern Impoundment design.
- Section 6 of this Report includes a description of how the RA for the Southern Impoundment can be implemented in a manner that minimizes environmental impacts in accordance with the EPA's *Principles for Greener Clean-Ups.*
- Section 7 of this Report includes a list of drawings developed to date for the Southern Impoundment RD, along with the list of anticipated detailed technical specifications. Any additional drawings will be submitted in a future design deliverable.
- Section 8 of this Report includes the drafts of all supporting deliverables identified in the SOW: Construction Health and Safety Plan (HASP), Emergency Response Plan (ERP), Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), Site Wide Monitoring Plan (SWMP), Construction Quality Assurance/Quality Control Plan (CQA/CQP), Transportation and Off-Site Disposal Plan (TODP), and Institutional Controls Implementation and Assurance Plan (ICIAP).
- Section 9 of this Report includes references to cited reports, correspondences, etc.

This Report also includes the following appendices: Southern Impoundment PDI Supporting Documents (including analytical and geotechnical laboratory reports, data validation reports and photographic logs for the PDI [Appendix A]); Southern Impoundment Treatability Study Supporting Documents (including water and soil analytical laboratory reports [Appendix B]); the Southern Impoundment Supporting Deliverables (Appendix C), and the Design Drawings (Appendix D).

2. Pre-Design Investigation

Prior to the PDI, soil investigations of the Southern Impoundment were completed in March 2011 and May 2012 as part of the remedial investigation (RI) to characterize soil chemistry for dioxins and furans. A summary and results of these investigations are included in the *Remedial Investigation Report* (Integral and Anchor QEA, 2013b) that was submitted to the EPA on May 23, 2013. These investigations were completed prior to the EPA setting of the clean-up level for Southern Impoundment soil of 240 ng/kg. As a result, a key goal of the Southern Impoundment PDI was to delineate and refine the areas and volume of Southern Impoundment soil requiring excavation based on the EPA's soil clean-up level.

The PDI for the Southern Impoundment was conducted in two phases, as described below.

2.1 First Phase Pre-Design Investigation (PDI-1)

The purpose of PDI-1 was to address the following data gaps for the Southern Impoundment:

- Characterization of dioxins and furans in the upper 10 feet of soils adjacent to cores collected during the RI in which the DWA $TEQ_{DF,M}$ concentrations were greater than 240 ng/kg in order to delineate areas not previously characterized and volumes of soil that will require removal.
- Geotechnical assessment of the soils within the excavation area of the Southern Impoundment to support engineering design.
- Characterization of waste in the Southern Impoundment that will require removal and off-Site disposal.

PDI-1 activities in the Southern Impoundment were completed from November 1 through 19, 2018, in accordance with the *First Phase Pre-Design Investigation Work Plan (*Integral and Anchor QEA, 2018b), dated August 24, 2018, and approved by the EPA on September 12, 2018 (EPA, 2018b), and the *Addendum to the First Phase Pre-Design Investigation Work Plan*, dated October 18, 2018 (Integral and Anchor QEA, 2018d).

Southern Impoundment PDI-1 field activities included soil sampling for chemistry, waste characterization, and geotechnical analyses at 45 sampling locations (Figure 4). Soil borings were advanced from the surface to 10 feet below ground surface (ft bgs) for chemistry and waste characterization, and from the surface to the Beaumont clay, approximately 35 ft bgs, for geotechnical sampling and testing.

A photographic log documenting the PDI-1 field event is included as part of Appendix A.

2.1.1.1 PDI-1 Chemistry Sampling

As part of PDI-1 activities, a total of 66 soil borings were installed at 45 locations in the Southern Impoundment. Of those samples, 26 were analyzed for dioxins and furans and 40 were archived for future analysis pending the results of the first 26 samples. All borings were installed to a depth of 10 ft bgs.

- Twelve borings were installed in six new locations (two borings co-located at each location) to fill in data gaps from the RI results. A single composite sample was collected from each location for analysis of dioxins and furans. A second co-located boring was collected at each location, archived in two-foot intervals and analyzed only if the composite sample result was greater than 240 ng/kg $TEQ_{DF,M}$.
- A total of 20 composite perimeter step-out borings were installed around five RI boring locations at which the $TEQ_{DF,M}$ was above 240 ng/kg $TEQ_{DF,M}$ (four borings per RI boring location, one in each of the four cardinal directions). A total of 20 interval perimeter, step-out, co-located borings were installed in the same locations as the composite borings. Samples were collected in two-foot intervals, archived and analyzed only if the composite sample result was greater than 240 ng/kg $TEQ_{DF,M}$.
- An additional 20 borings were collected from step-outs from the RI boring locations. These step-outs were beyond the bounds of the step-outs described above and were collected and archived in two-foot intervals. These were analyzed only if the original step-out composite sample result was greater than 240 ng/kg $TEQ_{DF,M}$.

Discrete and composite soil samples were collected via direct push methodology and submitted for analysis consistent with the *First Phase Pre-Design Investigation Work Plan* (Integral and Anchor

QEA 2018b). Samples were analyzed by ALS Laboratories in Houston, Texas for dioxins and furans using EPA approved method (1613B). Sample data validation was completed by a third-party validation firm (EcoChem, Inc.).

2.1.1.2 PDI-1 Geotechnical Sampling

A total of five geotechnical soil borings were installed to a total depth of 35 ft bgs in locations shown on Figure 4. Disturbed samples were collected from standard penetration test (SPT) split-spoon samplers and analyzed for moisture content, plasticity (Atterberg limits), specific gravity, and grain size distribution. Undisturbed samples were collected using Shelby tube samplers and analyzed for moisture content and bulk density testing. Most tests were performed in a laboratory setting, with blow counts being the only geotechnical test conducted in the field. Geotechnical samples were submitted to GeoTesting Express for analysis.

2.1.1.3 PDI-1 Waste Characterization Sampling

In order to support waste disposal planning, composite samples from 0 to 10 ft bgs were collected from five areas that were anticipated to be subject to removal, as depicted on Figure 4. Samples were analyzed for toxicity characteristic leaching procedure (TCLP) parameters and ignitability, corrosivity, reactivity, and toxicity, as outlined in Table 1. Due to the presence of debris not typical of paper mill waste in some previous cores, samples were also analyzed for total petroleum hydrocarbons (TPH) and asbestos.

2.1.2 Summary of PDI-1 Results

2.1.2.1 PDI-1 Chemistry Results

Of the 38 soil borings analyzed, 23 had DWAs above 240 ng/kg $TEQ_{DF,M}$ and 15 had DWAs below 240 ng/kg $TEQ_{DF,M}$, as seen on Figure 5. The validated analytical data is shown in Table 2. The laboratory reports and data validation report are included as part of Appendix A.

2.1.2.2 PDI-1 Geotechnical Results

The PDI-1 geotechnical results show interbedded clay, silt, and sand in the areas of the Southern Impoundment in which the geotechnical samples were collected. Soils were shown to have moderate moisture content. Atterberg classification of clay soils indicated that they contained a mix of clays and sands, with an approximately even mix of high plasticity, fat clays and low plasticity, lean clays. Interspersed within these clays were samples with a high sand content. The geotechnical sample results are included in Appendix A.

2.1.2.3 PDI-1 Waste Characterization Results

Based upon the results summarized in Table 1, the Southern Impoundment soils did not exhibit any of the four characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity), as defined in Title 40 of the Code of Federal Regulations (CFR) Part 261, Subpart C. As a non-hazardous waste, the soils would meet the definition of Class 1 or Class 2 industrial waste under the regulations governing classification of non-hazardous industrial solid waste in Texas (30 Texas Administrative Code [TAC] §335.505, 335.506, and 335.508).

Analytical results for asbestos indicated that the material would not require any special handling due to the presence of asbestos.

Analytical results for TPH for soil boring SJSB012-N1-Composite were slightly elevated, suggesting that additional evaluation should be conducted to help inform the classification of non-hazardous waste (Class 1 versus Class 2).

Additional waste characterization testing of Southern Impoundment soils was performed as part of the Southern Impoundment Treatability Study.

2.2 Second Phase Pre-Design Investigation (PDI-2)

The purpose of PDI-2 was to address the following data gaps for the Southern Impoundment:

- Refinement of the horizontal and vertical extent of the Southern Impoundment soil with a DWA $TEQ_{DF,M}$ greater than 240 ng/kg to a depth of 10 ft bgs.
- Geotechnical data to inform the design and construction of a bulkhead along the shoreline for a portion of the excavation.
- Topographic and above-ground utility survey data to support design elements related to access, staging, and excavation.

2.2.1 PDI-2 Investigation Activities

PDI-2 field work on the Southern Impoundment took place from September 3 through December 11, 2019, in accordance with the *Final Second Phase Pre-Design Investigation Work Plan (*GHD, 2019d), dated June 3, 2019, and approved by the EPA on August 8, 2019 (EPA, 2019c). On September 17, 2019, Tropical Storm Imelda caused significant flooding at the Site, shutting down all work until October 7, 2019. This event resulted in a force majeure event, approved by the EPA in correspondence dated October 30, 2019 (EPA, 2019f), that delayed the completion of PDI-2 field work.

Southern Impoundment PDI-2 field activities included installation of 21 chemistry sample boring locations, two geotechnical boring locations, and three treatability testing boring locations (Figure 6). The treatability testing and results are further discussed in Section 3. Soil borings were advanced from the surface to 10 ft bgs for chemistry borings, and from the surface to approximately 75 ft bgs for geotechnical sampling and testing.

A photographic log documenting the PDI-2 field event is included in Appendix A.

2.2.1.1 PDI-2 Chemistry Sampling

As part of PDI-2 activities, 21 chemistry soil borings were installed using direct push methodology to a depth of 10 ft bgs with discrete samples collected for every 2-foot (ft) interval. Each 2-ft interval sample was analyzed by Eurofins TestAmerica Laboratory in Sacramento, California for dioxins and furans using EPA approved Method (1613B) and percent moisture using Standard Method (SM) 2540G. Sample data validation was completed by GHD. The DWA for each location was calculated mathematically using the results of the five discrete interval samples for that boring to determine if the DWA for that location was above or below the clean-up level (240 ng/kg $TEQ_{DF,M}$).

Eleven of the soil borings were non-contingent borings and samples from these locations were analyzed immediately upon arrival at the laboratory. Samples from the other 10 borings were contingent samples (denoted as C1, C2, or C3) that were archived by the laboratory, and were only analyzed if the adjacent non-contingent boring of the same number had a DWA greater than 240 ng/kg $TEQ_{DF,M.}$

Analytical results from soil boring SJSB065 showed dioxin and furan concentrations greater than 240 ng/kg $TEQ_{DF,M}$ DWA. To fully delineate the southwestern corner of the Southern Impoundment, a step-out boring (SJSB065-C1) was added along the shoreline, as shown on Figure 6. On October 11, 2019, a Work Plan Refinement Notice (GHD, 2019f) was submitted to the EPA identifying the need to add a chemistry boring (SJSB065-C1) to the approved scope of work. The additional work was approved by the EPA on October 22, 2019 (EPA, 2019g).

On November 8, 2019, a Third Work Plan Refinement Notice (GHD, 2019g) was submitted to the EPA identifying the need to add three additional chemistry borings to the approved scope of work. The additional work was approved by the EPA on November 14, 2019 (EPA, 2019e). Analytical results from soil borings SJSB060-C1 and SJSB061-C1 showed dioxin and furan concentrations greater than 240 ng/kg $TEQ_{DF,M}$ DWA. To fully delineate that corner of the Southern Impoundment, three additional step-out borings were added, including SJSB060-C2 and SJSB060-C3 which were installed in the right-of-way on the east side of Market Street and SJSB061-C1 which was installed in the southeastern corner of the Glendale Boat Works property, as shown on Figure 6.

2.2.1.2 PDI-2 Geotechnical Sampling

Upon review of the geotechnical data obtained during PDI-1, geotechnical data was not identified as a data gap in the *Final Second Phase Pre-Design Investigation Work Plan* (GHD, 2019d). As such, no geotechnical borings were originally planned for purposes of PDI-2. Analytical results showed dioxin and furan concentrations greater than 240 ng/kg $TEQ_{DF,M}$ DWA in step-out soil boring SJSB065-C1, along the shoreline adjacent to the water in the southwest corner of the Southern Impoundment. As such, it was determined that it would be necessary to install a bulkhead along the shoreline in that corner to allow for excavation and backfill to be conducted under dry conditions. Two geotechnical soil borings were added to the approved scope of work in order to collect geotechnical data to inform the design of the bulkhead. The two geotechnical borings were identified in the Third Work Plan Refinement Notice (GHD, 2019f). The locations of these borings (SJGB028 and SJGB029) are shown on Figure 6.

Geotechnical soil borings were installed using a Central Mine Equipment (CME) mud-rotary drilling rig. Samples were collected and analyzed for moisture content (per American Society for Testing and Materials [ASTM] D2216); grain size (per ASTM D6913 and ASTM D7928); plasticity (Atterberg limits; per ASTM D4318); torvane shear (per ASTM D2537); and unconsolidated undrained (UU) triaxial shear strength (per ASTM D2850) to a depth of 75 ft bgs. Geotechnical samples were sent to Tolunay-Wong Engineers, Inc. in Houston, Texas for analysis.

2.2.2 Summary of PDI-2 Results

2.2.2.1 PDI-2 Chemistry Results

Of the 21 chemistry sample soil borings installed during the PDI-2, 20 were analyzed. Contingent boring, SJSB063-C1 was collected but was not analyzed due to the non-contingent boring of the same number (SJSB063) demonstrating DWAs below 240 ng/kg $TEQ_{DF,M}$. Of those 20, eight had DWAs above 240 ng/kg $TEQ_{DF,M}$ and 12 had DWAs below 240 ng/kg $TEQ_{DF,M}$, as seen on Figure 7. Analytical analysis and data handling for PDI-2 followed the procedures identified in the QAPP that was submitted in *Final Second Phase Pre-Design Investigation Work Plan* (GHD, 2019d) to ensure that data quality objectives (DQOs) were achieved. This included a systematic process, which includes data validation that is designed to ensure that the data collected are of the appropriate type and quality for its intended application. The validated analytical data is shown in Table 3 and provides quality assurance that the data collected are usable. The laboratory reports and data validation report are included as part of Appendix A.

2.2.2.2 PDI-2 Geotechnical Results

The PDI-2 geotechnical report is currently under review and will be included in a future design submittal.

2.2.2.3 PDI-2 Topographic and Utility Survey

To support design elements related to access, staging, and excavation, a topographic survey was conducted on the Southern Impoundment from July 29 through August 2, 2019. The survey was conducted by a surveyor (Morrison Surveying, Inc.) licensed in the state of Texas. Field data was collected using conventional surveying equipment, including a Trimble R10 global positioning system (GPS), and Trimble S6 robotic total station with supporting accessories. Surveying was completed on a 50-ft grid over the Southern Impoundment boundaries. Above-ground utilities were also noted during survey activities. Survey data was utilized to develop a topographical digital elevation map of the Southern Impoundment. This surface and all identified above-ground utilities have been incorporated into the design drawings.

2.3 Conclusions and Recommendations

PDI-1 results showed DWA dioxins and furans concentrations above 240 ng/kg $TEQ_{DF,M}$ DWA at 23 boring locations and the PDI-2 results showed concentrations above 240 ng/kg $TEQ_{DF,M}$ DWA at eight boring locations. The data from PDI-1 and PDI-2 was combined with the data from the RI to generate Thiessen polygons to determine the vertical and horizontal extent of the dioxins and furans concentrations in soil greater than 240 ng/kg $TEQ_{DF,M.}$ These Thiessen polygons are shown on Figure 8. The analytical laboratory reports from the PD-1 and PDI-2 sampling events can be found in Appendix A. The results for the discrete sample intervals and mathematically calculated DWAs for the RI, PDI-1, and PDI-2 events are summarized in Table 4.

Based on the results from the RI and PDI events, there are four main areas in which removal of soil is proposed, as shown on Figure 8. The Thiessen polygons developed from these results are the basis for the excavation area and volume in this Southern Impoundment 30% RD.

The geotechnical results from the PDI-2 are currently being reviewed and will be utilized to inform the design of the bulkhead planned for installation in the southwest corner of the Southern Impoundment. A summary of these results and the geotechnical report will be included in a future design submittal.

3. Treatability Study

3.1 Treatability Study Overview

Pursuant to the ROD, excavated Southern Impoundment soil may need to be solidified to eliminate free liquids prior to transport for off-Site disposal and any contact water generated in the excavation through seepage and/or stormwater accumulation would need to be treated prior to discharge.

As part of the PDI-2 field activities, soil and borehole water samples were collected from the Southern Impoundment to utilize for treatability testing, as specified in the TSWP (GHD, 2019c) submitted to the EPA on May 20, 2019, and approved on August 27, 2019 (EPA, 2019d).

Three composite soil samples were collected from locations in the Southern Impoundment with concentrations of dioxin and furans greater than 240 ng/kg $TEQ_{DF,M}$ DWA to utilize for supplemental waste characterization sampling and evaluation of solidification mix design, as necessary.

In addition, a robust field pilot test which involved on-Site clarification and filtration was performed as part of treatability studies for the Northern Impoundment on contact water generated from the Northern Impoundment. Laboratory particle size analysis was also performed on the Northern Impoundment samples to evaluate the effectiveness of filtration micron size at removing dioxins and furans. Results of those Northern Impoundment treatability studies that provide the basis for the water treatment element of the Southern Impoundment RD are provided below. Detailed results of the Northern Impoundment treatability studies on contact water will be provided as part of the Preliminary 30% Remedial Design for the Northern Impoundment. Information about those treatability studies are provided in this Report, reserving the right to supplement and/or modify such information as it relates to the Northern Impoundment based upon this future submittal. To ensure the testing completed on the Northern Impoundment contact water was applicable to the Southern Impoundment, a representative borehole water sample was collected from the Southern Impoundment and analyzed to obtain characterization data as a relative comparison to that obtained from the Northern Impoundment and used in the pilot test and laboratory treatability study.

3.2 Treatability Study Objectives

As outlined in the TSWP, the objectives related to the Southern Impoundment Treatability Study included:

- Evaluate the re-use of contact water on-Site for in-situ solidification of the South Impoundment waste material.
- Evaluate optimum solidification mix designs to solidify the waste material for transportation and disposal.

- Evaluate optimum solidification mix designs to meet requirements for Class 1 and/or Class 2 non-hazardous industrial waste disposal, in accordance with 30 TAC 335.505-506 and 335.508.
- Characterize the borehole water quality for evaluation of incorporation into the solidification mix design.

The TSWP did not include treatability testing for the Southern Impoundment. It was later determined that treatability testing for the Southern Impoundment should be performed, based on a determination regarding the volume of groundwater that may be encountered and could not be used in solidification of excavated soils.

Characteristics of the borehole water collected in the Southern Impoundment were correlated to the characteristics of the samples collected in the Northern Impoundment. The purpose of the comparison was to determine if water quality characteristics and sample results of treatability evaluations performed on Northern Impoundment water samples could be applied to water that may be encountered during the RA at the Southern Impoundment.

3.3 Soil Treatability Testing

Based on the origin of waste material in the Southern Impoundment, the waste material is not listed as hazardous under 40 Code of Federal Regulations (CFR) Part 261, Subpart D. Further, waste characterization samples collected during the PDI-1 were analyzed for ignitability, corrosivity, reactivity, and toxicity, as defined in Title 40 of CFR Part 261, Subpart C, to determine if the material was a characteristic hazardous waste. The results indicate that the material is not a characteristic hazardous waste under Resource Conservation and Recovery Act (RCRA) or Texas Commission on Environmental Quality (TCEQ) regulations. Validated PDI-1 waste characterization data are included in Table 1.

Additional testing was conducted during the Treatability Study to further classify the non-hazardous waste under applicable TCEQ rules. The material was tested in accordance with EPA Method SW-846 Test Method 9095B (i.e., paint filter test), to determine whether free liquids were present which would prevent the material from being disposed of without solidification.

3.3.1 Soil Sample Acquisition

As part of Southern Impoundment PDI-2 activities, between October 9 and 12, 2019, four 5-gallon buckets of soil were collected from each of three treatability sample locations, as shown on Figure 9. Sample locations were selected based upon data collected during the RI and PDI-1 indicating that the soil in the area had dioxin and furan concentrations greater than 240 ng/kg $TEQ_{DF,M}$ DWA. Samples were collected and composited from soil borings installed using direct push methodology. Samples were containerized, sealed, and driven via courier to the GHD Treatability Laboratory in Niagara Falls, New York on October 17, 2019.

3.3.2 Soil Treatability Activities

Soil samples were analyzed for the following parameters to determine whether they meet TCEQ Class 1 or Class 2 non-hazardous landfill disposal requirements:

- TCLP Dioxins and Furans - EPA 1613B

- TCLP Volatile Organic Compounds (VOCs) - EPA 8260C
- TCLP Semivolatile Organic Compounds (SVOCs) - EPA 8270D
- TCLP Organochlorine Pesticides - EPA 8081B
- TCLP Polychlorinated Biphenyls (PCBs) - EPA 8082A
- TCLP Herbicides - EPA 8151A
- TCLP Glycols - EPA 8015D Direct Injection
- TCLP Metals - EPA 6010C
- TCLP Mercury - EPA 7470A
- TCLP Methomyl - EPA 8321A
- Total Cyanide - EPA 9014
- Sulfide - EPA 9034
- Ignitability - EPA 1020B
- pH - EPA 9045D
- Paint Filter - EPA 9095B

As outlined in the TSWP, solidification reagent testing was planned to be performed on any samples of waste material that failed any of the TCLP or paint filter analyses. Since the samples from the Southern Impoundment all passed paint filter and did not leach any materials in excess of Subtitle D or Texas Class 2 criteria, solidification of the soils will not be required and further reagent testing was not completed during the treatability study.

3.3.3 Soil Treatability Results and Conclusions

Baseline characterization results for the Southern Impoundment soil treatability samples were consistent with results obtained during PDI-1, indicating that the soil can be classified as non-hazardous. In addition, the characterization results indicate that the soil met criteria for disposal in a Texas Class 2 landfill, with the exception of sulfide in two of the three samples. During implementation of the remedy, it is anticipated that sulfide will be at acceptable concentrations for disposal at a Subtitle D/Texas Class 2 landfill as a result of stockpiling larger volumes of soil prior to transportation off-Site. There were no other exceedances of hazardous waste parameters. The results from the soil characterization are shown in Table 5.

3.4 Water Treatability Testing

The EPA has made the determination regarding the ARAR for compliance with the Texas Surface Water Quality Standard (TSWQS) based on the substantive requirements of the state's regulation for surface water discharge. As detailed in e-mail correspondence dated February 18, 2020 (EPA, 2020), "EPA has determined that compliance with the TSWQS ARAR will be attained as follows:

- The state surface water quality standard for Dioxins/Furans is 7.97 x 10^{-8} µg/L [0.0797 picograms per liter {pg/L}] (as TCDD equivalents).

- Compliance with the TSWQS will be determined using the minimum level of the EPA approved Method (1613B), cited in 40 CFR Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants), in sampling of surface water discharges during the Site remedial action.
- If an effluent sample analyzed for dioxin is below the minimum level using the EPA approved method, the sample result would be identified as non-detect and the discharge would be determined to be in compliance with the ARAR.

The Minimum Level (ML) for each analyte is defined as the level at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and clean-up procedures have been employed.

This approach is consistent with the state's guidance and other permits issued by the TCEQ."

If an effluent sample analyzed for dioxin is below the ML using the EPA approved method, the sample result will be identified as non-detect and the discharge will be determined to be in compliance with the ARAR.

Extensive treatability testing was performed both on-Site at the Northern Impoundment as part of a pilot test and in the GHD Treatability Laboratory using contact water generated from the Northern Impoundment to evaluate water treatment options. A borehole water sample was obtained from the Southern Impoundment for baseline characterization to ensure that the results obtained from the Northern Impoundment treatability testing were applicable to borehole water collected at the Southern Impoundment.

As described in the TSWP, two water management approaches were to be evaluated as part of the treatability study; traditional treatment through clarification and filtration, and thermal evaporation. Based upon the results of treatability testing and the EPA's determination regarding the applicable surface water discharge ARAR (see Section 5.4.1.4), traditional treatment through clarification and filtration was identified for use in the Southern Impoundment 30% RD; therefore, thermal evaporation is not being considered as a water management approach, so any further discussion of its initial evaluation (in addition to the information contained in Section 3.4.1.2) is not included in this Report.

3.4.1 Water Sample Acquisition

3.4.1.1 Southern Impoundment Borehole Water

As described in the TSWP, GHD planned to collect contact water from approximately three soil boring locations in the Southern Impoundment to establish baseline characterization conditions. Consistent with previous investigations, seepage water was rarely encountered in open boreholes. Only one borehole generated a sufficient volume of water to conduct limited baseline characterization. On October 24, 2019, GHD was able to collect 1.5 gallons of borehole seepage water from boring SJSB059 using a bailer. The location of the water sample is shown on Figure 9. The sample was containerized in a 5-gallon bucket, sealed, and driven via courier to the GHD Treatability Laboratory in Niagara Falls, New York.

3.4.1.2 Northern Impoundment Excavation Seepage and Contact Water

In order to generate the large volume of water required for the thermal evaporation pilot test, 20,000 gallons of representative contact water were generated from the Northern Impoundment. In order to produce this volume, waste material in the western portion of the impoundment was excavated from a 20-ft by 20-ft by 10-ft cell. The excavated material was stored in roll-off containers. The excavation remained open overnight, and water that seeped into the excavation was collected. In addition, to obtain adequate volume of contact water, approximately 20,000 gallons of potable water was then transferred into the excavation and mixed using an excavator bucket to generate a worst case suspended solids mixture that may be encountered in stormwater during the RA. This simulated contact water was then pumped to two storage tanks and the contents of the two tanks were homogenized and subsequently sampled.

3.4.2 Water Treatability Activities

3.4.2.1 Southern Impoundment Borehole Water Baseline Analysis

In order to establish baseline characterization conditions for seepage water in the Southern Impoundment, the sample collected from soil boring SJSB059 was analyzed for the following characterization parameters:

- Dioxins and Furans - EPA 1613B
- VOCs - EPA 8260C
- SVOCs - EPA 8270D
- PCBs - EPA 8082A
- Total and Dissolved Metals - EPA 6010C
- Total and Dissolved Mercury - EPA 7470A
- Ammonia Nitrogen - EPA 350.1
- Chemical Oxygen Demand (COD) - EPA 410.4
- pH - EPA 9040C
- Total Dissolved Solids (TDS) - SM2540C
- Total Organic Carbon (TOC) - SM5310C

Full characterization, including parameters such as total suspended solids and dissolved dioxins, could not be completed due to the limited sample volume.

3.4.2.2 Northern Impoundment Pilot Treatability Testing

As mentioned in Section 3.4.1.2, contact water was generated in the Northern Impoundment by placing potable water in an open excavation in the Western Cell. This simulated contact water was then processed through an on-Site treatment system which included polymer addition with inline mixing followed by clarification, sand filtration, and bag filtration. Water samples were collected and analyzed at different steps in the process, as depicted in a process flow diagram, included as Figure 10. The following samples were collected and analyzed:

- Excavation Seepage Water
- Homogenized Contact Water (Tank 1)
- Homogenized Contact Water (Tank 2)
- Clarified Effluent
- Filtered Effluent

All samples were analyzed for the following characterization parameters:

- Dioxins and Furans - EPA 1613B
- VOCs - EPA 8260C
- SVOCs - EPA 8270D
- PCBs - EPA 8082A
- Total and Dissolved Metals - EPA 6010C
- Total and Dissolved Mercury - EPA 7470A
- Alkalinity - SM 2320B
- Ammonia Nitrogen - EPA 350.1
- Anions (bromide, chloride, fluoride, nitrate, nitrite, sulfate) - EPA 300.0
- Biochemical Oxygen Demand (BOD) - SM 5210B
- COD - EPA 410.4
- Cyanide - EPA-SW846-9012B
- Ferrous iron - SM 3500
- Hydrogen sulfide - SM 4500
- pH - EPA 9040C
- Phosphorus - EPA-SW846-6010D/3050B/7471B
- Sulfide - EPA-SW846-9034
- TDS - Standard Methods SM2540C
- TOC - Standard Methods SM5310C
- Total Suspended Solids (TSS) - SM 2540D

3.4.2.3 Laboratory Particle Size Analysis by Filtration

To further evaluate filtration requirements, testing was performed in the GHD Treatability Laboratory on samples of the contact water from the Northern Impoundment. This serial filtration test was performed in order to determine the size distribution of the particles present in the contact water and any relationship between particle size and the concentration of dioxins and furans in the sample.

The test was performed on a 7-liter sample of homogenized contact water. The entire 7-liter sample was then filtered through a pre-weighed 100 micron (µm) filter paper. A 1-liter sample of the filtrate was then collected for analysis of dioxins/furans. This process was then repeated using the remaining filtrate water and pre-weighed 41, 10, 1, 0.45, and 0.1 µm filter papers with collection of a filtrate sample after each filtration.

After the filtration test was complete, each filter paper was dried and then weighed to determine the amount of particulate captured on the filter and the filtrate samples were analyzed for dioxins and furans.

3.4.3 Water Treatability Results and Conclusions

3.4.3.1 Effluent Limitation Assessment

A water quality-based effluent limitations assessment was completed to ensure that the effluent from the Southern Impoundment maintains instream criteria for dissolved oxygen and other parameters such as bacteria, phosphorus, nitrogen, turbidity, dissolved solids, temperature, and toxic pollutants. This assessment is an indication that the water quality standards for the receiving water body are met. These numeric water quality criteria are values expressed as levels, or constituent concentrations, or numbers deemed necessary to protect the receiving water. Water from the Southern Impoundment will discharge to the Segment 1005 of San Jacinto River, which is classified as a tidal river. Accordingly the TCEQ model, TEXTOX MENU # 5 for bay or wide tidal rivers was utilized to determine the water quality-based effluent limitations for COPCs for the Southern Impoundment based on the receiving water body. These estimated discharge criteria are included in Table 6. For dioxins and furans, results were compared to the ML, as discussed in Section 3.4.

3.4.3.2 Southern Impoundment Borehole Water Results

Analytical results for the sample obtained from the borehole on the Southern Impoundment are summarized in Table 6. The available results were compared to the Northern Impoundment excavation contact water collected during the pilot test. These results are also included in Table 6. Analytical laboratory reports are included as part of Appendix B.

Evaluation of the results from the two samples analyzed indicates that the chemistry of the Southern Impoundment borehole water is similar to the Northern Impoundment excavation contact water. Concentrations of metals and dioxins and furans are primarily associated with the level of solids in the water. The average TSS concentration in the Northern Impoundment simulated contact water sample was approximately 4,000 milligrams per liter (mg/L). This concentration is greater than what is anticipated to be encountered in the Southern Impoundment via seepage or stormwater and will be conservatively used as the basis for the Southern Impoundment 30% RD.

3.4.3.3 Northern Impoundment Pilot Treatability Results

Results of the water samples from each step of the on-Site pilot treatability testing are summarized in Table 6 and were compared to the estimated discharge criteria, as described in Section 3.4.2.2. The contact water initially exhibited high levels of dioxins and furans, TSS, and some metals (including copper, lead, and zinc). Following clarification, the metals in the clarified effluent sample were below estimated discharge limits. Results for all analytical parameters, including dioxins and furans, were below the estimated discharge criteria for the filtered effluent sample. Figure 10 shows a visual depiction of the step-wise decrease in dioxins, metals, and TSS levels at each step in the treatment process. This treatment process was used as the basis for the Southern Impoundment 30% RD with additional unit processes, as discussed in Section 5.4. It should be noted that alternatives exist for the management of contact water, such as transportation and disposal at a publicly-operated treatment works (POTW); however, those alternatives will be further evaluated later in the design process.

3.4.3.4 Laboratory Particle Size Analysis by Filtration Results

The results of the filtration test showed that 30.4 percent of the solids from the water were trapped on the 41 µm filter indicating that they are between 41 µm and 100 µm in size. A further 61.6 percent were trapped on the 10 µm filter indicating that these particles were between 10 µm and 41 µm in size. Overall, greater than 90 percent of the particulates were greater than 10 µm in size. Concentrations of dioxins and furans in excess of the MLs were observed in the filtered water that had passed through the 100 µm, 41 µm, and 10 µm filters, however after filtration with a 1 µm filter, concentrations of all dioxins and furans were below their MLs. These results are summarized in Table 7. Analytical laboratory reports are included as part of Appendix B.

These results, along with the results summarized in Section 3.4.3.2, have informed the basis of design for the Southern Impoundment 30% RD.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

Compliance with ARARs does not include formal submission of permit applications to the agencies to provide permits or approvals. Instead, information sufficient to demonstrate compliance at the Site will be presented to the EPA and coordinated with other agencies.

The EPA recognizes the following three types of ARARs:

- ***Chemical-Specific ARARs:*** Chemical-specific ARARs include health- or risk-based numeric limits or methods that establish the acceptable amount or concentration of a chemical that may be found in or discharged to the environment.
- ***Location-Specific ARARs:*** Location-specific ARARs include limits on allowable concentrations or on activities associated with hazardous substances solely because they occur in special locations.
- ***Action-Specific ARARs:*** Action-specific ARARs include technology- or activity-based requirements or limitations on actions involving the management of hazardous waste.

The applicable regulatory requirements along with project-specific comments that explain how these regulations apply to the project, and how the RD and RA will comply with the regulations are summarized in Table 8. Table 8 addresses each of the ARARs identified in the ROD and certain additional ARARs applicable to the Southern Impoundment RD.

5. Remedial Design

This section outlines the main RD components associated with the Southern Impoundment including the following:

- Excavation Limits and Procedures (including Landowner Coordination)
- Structural Design of the Bulkhead
- Transportation and Disposal
- Water Management
- Monitoring and Controls

5.1 Excavation Limits and Procedures

5.1.1 Landowner Coordination

Prior to the remedial work, and assuming EPA approval of excavation areas and procedures as outlined herein, access agreements will need to be concluded with two separate landowners, Kirby Inland Marine (Kirby) and Musgrove Towing Service, Inc. (Musgrove). In addition, other property owners on the peninsula on which the Southern Impoundment is located have access rights with respect to Market Street, the private road that borders the Southern Impoundment, and their consent to activities that impact use of Market Street may be required. In addition, prior to and during the remedial work, coordination will be required with these two landowners and the users of Market Street, as the work will temporarily disrupt current operations, including in the case of Kirby and Musgrove, potential impact to an existing elevated building, concrete slab and parking area. The work may require sequencing to limit this disruption, to the extent practicable; that sequencing may not be fully known until during the time of the excavation planning by a contractor.

The sequencing of the RA for the Southern Impoundment and RA for the Northern Impoundment and the potential interplay between the schedule for implementing the two remedies are uncertain. As such, the negotiations for access with the landowners and tenants for the Southern Impoundment RD will be dependent on this sequencing and the associated schedule.

5.1.2 Preparation for Excavation Work

Prior to initiating any soil removal work, environmental controls (e.g., silt fencing, surface water diversions, and air monitoring) will be implemented by the contractor. These environmental controls may include requiring silt fencing around all excavations to minimize the potential for soil erosion. They also may include surface water diversions (e.g., soil berms or other type of structures) constructed along the edge of excavations to minimize surface water from entering into the excavation. For excavations near the roadway (Market Street), straw bale or rock check dams may be required in the roadside ditch.

In order to control dust and emissions, preventative measures will be specified for use, as necessary based on dust monitoring results. These preventative measures may include measures such as the use of water or suppression additives (e.g., Spray-on paper mulch or foam).

Prior to commencing excavation, a complete topographic survey of each excavation area will be conducted to establish pre-excavation Site conditions. The recorded topographic information (coordinates and elevations) will be used by the engineer to create final electronic files to be used by the computer-guided excavation equipment. The known limits of each excavation will also be identified in the field by the surveyor prior to commencing excavation.

5.1.3 Excavation Sequencing

To reduce the risk of flooding of work areas within the Southern Impoundment, the excavation activities will only occur between the months of November and April, when the San Jacinto River stage is routinely lower resulting in a reduced likelihood of flooding of the Southern Impoundment. This is a preferred risk management approach as it reduces the potential for a major storm event that negatively impairs soil removal activities and creates potential of a release of contact water from an open excavation.

To facilitate the excavation process, it is anticipated that the soil removal may be conducted using benching in lieu of sloping. In order to accomplish benching that meets a 3:1 side slopes for soil removal, it is anticipated that each individual bench would include a 2-ft vertical cut and then a 6-foot wide horizontal bench. The bench sidewalls would be maintained as vertical as possible. Subject to further definition in the design process, excavation of each polygon area shown on Figure 8 (or group of polygons) is anticipated to be conducted in approximately 2-ft thick lifts in order to perform the excavation in accordance with the sampling data obtained during the PDI. The vertical interval of soil removal will vary between polygons, and therefore the limits of excavation will be identified in the field in advance of any soil removal.

For the majority of the excavation planned in the Southern Impoundment, solidification of the excavated soils is not anticipated prior to loading into trucks for transport to an approved off-Site waste disposal facility. However, in the deeper excavations, there is a possibility that the groundwater table will be encountered, potentially in the 8 to 10-ft depth interval. There is also the possibility that wet soils would require water removal following a storm event. Methods that may be utilized to facilitate drying of such soils include solidification by amendment addition (e.g., dirt, fly ash, lime, or absorbent polymer).

5.1.4 Excavation Limits

In connection with the *Final Second Phase Pre-Design Investigation Work Plan* (GHD, 2019d), and subsequently, the EPA has indicated that the clean-up level of 240 ng/kg $TEQ_{DF,M}$ using a DWA over the upper 10 feet of soil should be used in developing the Southern Impoundment RD.

Following completion of the PDI-2, the soil sample results for individual borings (including PDI-1 and RD borings) were evaluated against the soil clean-up value of 240 ng/kg $TEQ_{DF,M}$ DWA; the results are presented in Table 4. Based on these results, specific 2-ft interval vertical soil horizons were identified for excavation such that, following their removal, the resulting soil would be below the 240 ng/kg $TEQ_{DF,M}$ DWA. Soils that do not require removal to meet the 240 ng/kg $TEQ_{DF,M}$ DWA will either be temporarily stockpiled or remain in place.

As previously described in Section 2, the vertical soil intervals (along with horizontal extents) requiring excavation were based on the combined results from the RI, PDI-1, and PDI-2 to generate

Thiessen polygons. These areas are represented by approximate half-acre or less areas, as shown on Figure 8. These areas requiring soil removal are located in four distinct portions of the Southern Impoundment.

For the areas requiring soil removal near Market Street and the Glendale Boat Works, Inc. property, the lateral limits of the excavation will extend immediately up to Market Street and the Glendale Boat Works, Inc. property limits; however, the excavation will not extend into either the street or onto the Glendale Boat Works, Inc. property.

For the areas requiring soil removal on the southwest portion of the Southern Impoundment, a bulkhead will be installed adjacent to the San Jacinto River. The excavation will be completed up to the lateral limit of this bulkhead.

A survey will be conducted to confirm the boundaries of the Market Street right-of-way, Glendale Boat Works property, and other properties necessary to implement the design.

5.1.5 Excavation Volumes and Disposal Volumes

Based on the results of the RI, PDI-1, and PDI-2, specific 2 foot-interval vertical soil horizons were identified for excavation such that, following their removal, the resulting soil would be below the 240 ng/kg $TEQ_{DF,M}$ DWA. Soils that do not require removal to meet the 240 ng/kg $TEQ_{DF,M}$ DWA will either be temporarily stockpiled or remain in place. This results in an estimated total excavation volume of approximately 56,000 cubic yards, of which approximately 30,000 cubic yards will be temporarily stockpiled and then used as backfill (because it does not require off-Site disposal) and approximately 26,000 cubic yards will be transported off-Site for disposal.

5.1.6 Excavation Methodology and Confirmation

The required excavations for the Southern Impoundment will be performed from the ground surface and it is anticipated that no personnel will enter into any of the excavations. This is a preferred approach from a health and safety perspective. Subject to further assessment as the design process proceeds, it is anticipated that all soil removal work will be performed using an excavator with an excavator with an extended-reach arm to be used as necessary. The specifications to be developed later in the design process may require that the bucket of the excavator to be outfitted with GPS indication equipment (i.e., Topcon 3DXi) or may impose other requirements that will allow for the collection of survey data (elevation and location) to be accurately monitored to within approximately $\pm$1/10 of an inch, without the necessity for personnel entry into the excavation to collect this data. In addition, and subject to further assessment as the design process proceeds, a licensed land surveyor may perform data collection from the ground surface outside the limits of the excavation by electronic means.

In addition, to reduce the volume of stormwater that would require management, specifications may be established later in the design process that will limit the size of the excavations that the contractor may have open at any given time.

5.1.7 Vehicle Decontamination Procedures

Hauling vehicles will be decontaminated prior to leaving the work Site. Vehicle decontamination procedures that may be implemented may include requiring hauling vehicles after they are loaded to proceed to the vehicle decontamination area (i.e., decontamination pad) to be visually inspected and cleaned, as needed. Vehicle decontamination procedures may also include provisions for keeping loaded soil from falling on the outside of the hauling containers. Detailed specifications for these procedures will be developed later in the design process.

5.1.8 Protection of Structures and Utilities

For the southern-most excavation area, there is an existing building (elevated frame structure) and a concrete slab on the Musgrove property that will either need to be worked around and under, or may need to be demolished and removed prior to excavating the underlying soil in that location. The location of this existing building is shown on Design Drawing C-03 and is south of boring location SJSB023-S1 and east of boring location SJSB066.

At this time, information about the depth of the pilings associated with this existing building is not available. Further assessment of the piling depths will be completed later in the design process. The building may need to be temporarily demolished, either prior to or during the remedial construction. Alternative facilities may need to be made available to the landowner and tenant. These issues, together with the need for use of this building or a replacement structure during excavation activities, will be discussed with the owner and tenant during access negotiations necessary to implement the remedial work.

All utilities will be protected, relocated, or removed (if abandoned) as necessary to complete excavation work safely. Further evaluation of the utilities is planned later in the design process. In addition, the contractor will be responsible for obtaining the necessary utility clearances prior to commencing excavation work. This includes contacting the Texas “One-Call 811” service for a public utility locate, as well as retaining the services of a private utility locator to mark private on-Site utilities.

5.1.9 Backfill Placement

Upon completion of the soil removal, the excavations will require backfilling to the original ground surface elevations. More detailed specifications for backfill placement will be developed later in the design process. Those specifications may include requiring that stockpiled or imported fill be placed within the completed excavation in approximate12-inch lifts and compacted and that compaction equipment be used multiple times for each lift (i.e., minimum of three passes of a compaction roller wheel or vibratory plate tamper).

The imported fill specifications will include physical requirements, which may include requirements that the fill be well graded and compactible to specified standards. Specifications for the imported fill material will require that it meet specified standards, which may include that the fill material be free of rocks larger than a certain size, organic matter, and other materials that may be difficult to compact, such as very soft clays, swelling clays, or fine uniform sands.

Upon completion of backfilling a professional land surveyor will be used to document the final ground surface elevations, with the intent to match the pre-existing ground surface elevations, to the extent possible. The drainage ditch along the east side of the Southern Impoundment (west side of Market Street) will be reconstructed, as needed, once the backfilling is completed.

5.1.10 Excavation Area Restoration

Upon completion of excavation and backfilling, the ground surface of the excavation areas will be restored to their current condition. Depending on the location of the excavation and current surface characteristics, restoration efforts may include replacement of any existing granular surfaces, such as gravel, placement of six inches of vegetated topsoil, or other measures.

All topsoil material will be imported from an approved source and will be required to meet specified standards that will be established, which might include that it be a friable loam material (neither of heavy clay nor of very light sandy nature) and capable of supporting growth of grass or other specified vegetative cover and also be will be free roots, rocks, or lumps larger than a specified size, and noxious weeds meet minimum and maximum percentages of organic matter, and have a pH in a specified range.

5.2 Structural Design of Bulkhead

A steel sheet-pile bulkhead of approximately 180 feet in length will be installed along a portion of the southwest edge of the Southern Impoundment, directly adjacent to the San Jacinto River as shown on Design Drawing C-03 (Site Works). The sheet-pile bulkhead will allow the excavation to be performed in polygon SJSB065-C1 (which is immediately adjacent to the river) in dry conditions. Subject to the consent of the property owner, it is anticipated the bulkhead will be left in place after completion of the excavation.

5.2.1 Basis of Design

5.2.1.1 Datum

The horizontal datum for the project is NAD83. All elevations are referenced to North American Vertical Datum of 1988 (NAVD88 vertical datum).

5.2.1.2 River Water Level

The surveyed level of river flow ranges between +1 and +2 ft.

5.2.1.3 Freeboard

The top of the sheet-pile bulkhead will provide 3 to 4 feet of freeboard above the mean river flow elevation.

5.2.1.4 Design Water Level

Subject to continuing evaluation of River water levels, a design water level of +5 ft above mean river flow elevation will be utilized for the sheet-pile bulkhead. This elevation was selected to provide an adequate freeboard such that the excavation in polygon SJSB065-C1 can be completed with a low likelihood of flooding while working in that area. The risks associated with San Jacinto River levels greater than +5 ft can be reduced in this situation due to the limited time duration that will be required to excavate and backfill the polygons located in that vicinity, SJSB065-C1 and SJSB065, the excavation depth (see Section 5.2.1.5 below), limiting the working season to between November and April, and taking steps to cover open excavations or stop work if storm events or rising River levels are forecast. A higher design water level would require the bulkhead to extend farther inland with an exposed sheet pile profile taller than the ground level in the vicinity and would disrupt use of the existing parking lot and access road.

5.2.1.5 Excavation Depth

Based on the DWA calculation for the excavation polygons, the elevation of excavation in polygon SJSB065-C1 adjacent to the sheet-pile bulkhead would range from slightly above -2 ft down to -7 ft, directly adjecent to the bulkhead.

5.2.1.6 Corrosion Protection & Maintenance

Since it is anticipated that the bulkhead will be left in place permanently, protection against corrosion through the design life of the structure is important. Corrosion protection may be provided in the form of sacrificial thickness of the wall in addition to the thickness required to withstand design loads. Proper drainage will also be designed to relieve the build-up of hydrostatic pressure on the interior (land-based) side of the wall.

5.2.1.7 Material

Sheet-piles are assumed to be steel grade ASTM A572, Grade 50 (yield [F_y] = 50 kilopound per square inch [ksi]). Marine grade steel ASTM A690, Grade 50 may be used to provide corrosion protection, extend the design life of the structure and minimize maintenance by the property owner after completion of the RA.

5.2.1.8 Design Loads

In-Situ Soil

The soil parameters specific to the Southern Impoundment are listed in Table 9. Both drained and undrained loading conditions will be considered. The designation for soil parameters are in accordance with Unified Soil Classification System.

River Water

The loading from the river water with a density of 62.4 pounds per cubic foot (pcf) is applied as hydrostatic pressure to the exterior of the wall. Hydrostatic pressure for both mean water level and design water level are considered in this design.

River Flooding

Based on FEMA Flood Map (effective on January 16, 2017), the Southern Impoundment is designated a special flood hazard area Zone AE. Based on the anticipated excvation depths, and as the excavation will be completed in short duration outside the flooding event season (November to April), flood load was not considered for the design of the sheet-pile wall.

Wind

Pressure from wind loading corresponding to wind velocity of 115 miles per hour (mph) and Exposure Category C as defined in ASCE 7 will be applied on the exterior of the wall. Wind load will only be applied to the exposed height of wall above mean water level; therefore at design water level, the wall exterior is not exposed to the wind.

5.2.1.9 Load Combinations

The design loads are considered to act in the following combinations, in accordance with Allowable Stress Design as defined in ASCE 7 for the structural design.

(1) D + H + F

(5) D + H + F + 0.6W

(6A) D + H + F + 0.75(0.6W)

(7) 0.6D + H + F + 0.6W

WHERE,

D = DEAD LOAD

F = LOAD DUE TO FLUIDS (HYDROSTATIC PRESSURE)

H = LOAD DUE TO LATERAL EARTH PRESSURE

W = WIND LOAD

ASCE 7 load case (7) requires the load factor for resisting (passive) lateral earth pressure be reduced to 0.6. The intent of the reduction is to design the wall against overturning by reducing the resistance. Since the wall is being designed for overturning (rotational) stability with adequate embedment as described in Section 5.2.2.1, a reduction for lateral earth pressure is not considered.

5.2.2 Design Criteria

The sheet-pile bulkhead is being designed as a rigid cantilever wall in accordance with EM 1110-2-2504. As the wall is anticipated to be in place permanently, both the undrained and drained conditions are being evaluated to determine the sheet-pile section that meets the criteria below. However, it should be noted that drainage will be provided (after completion of excavation and backfilling) to relieve the build-up of hydrostatic pressure on the interior side of wall hence, the drained condition represents a conservative loading for purposes of the design.

5.2.2.1 Rotational Stability

It is a standard design assumption that rotational stability is directly proportional to the embedment of a rigid cantilever wall. The total embedment of the pile is the maximum of the depths required for undrained and drained loading condition.

The sheet-pile bulkhead is being designed with a factor of safety of 1.5 for rotational stability. The required pile depth elevation is -50 ft NAVD88.

5.2.2.2 Section Strength

The sheet-pile bulkhead will be designed and analyzed as a rigid cantilever wall for the loads described in Section 5.2.1.8. The allowable stress in the sheet-pile would be 0.5 F_y (with a factor of safety of 2.0) for combined and axial bending and 0.33 F_y (with a factor of safety of 3.0) for shear.

5.2.2.3 Deflection

Total system displacements comprised of structural steel deformation, rotation and translation of the entire wall and soil system will be evaluated. Since the sheet-pile bulkhead will be designed as a cantilever wall, maximum deflections occur at the top of the wall.

EM 1110-2-2504 or ASCE 7 does not provide guidance on limiting system deflection. Structural steel can deform significantly causing visual concern for personnel working within the cell before structural failure occurs; hence, structural steel deformation cannot be used as a limiting parameter for the design.

A general rule of 0.01 x wall height, measured from top of wall to bottom of excavation will be applied to limit the total deflections.

WALL HEIGHT = +5FT - (-7FT) = 12 FT

ALLOWABLE DEFLECTION = 0.01 X 12 FT = 0.12 FT = 1.5 INCHES.

5.3 Characterization, Transportation, and Disposal

The RD elements related to the characterization, transportation and off-Site disposal of removed soil from the Southern Impoundment are outlined in the TODP, Appendix C Attachment 7 to this document. The TODP summarizes the regulatory requirements, characterization results, disposal facility profiling requirements, on-Site management and loading, transportation plans, and record keeping.

5.4 Water Management

5.4.1 Basis of Design

5.4.1.1 Contact Water Characterization

During PDI-2, a groundwater sample was collected from Southern Impoundment boring SJSB059 and was analyzed to provide a representative sample of potential contact water that may be generated during the remedial work and require treatment. During treatability testing, results from this location were compared to the characteristics of the groundwater collected from the Northern Impoundment and the characteristics are similar. Therefore, treatability testing was only performed on the Northern Impoundment infiltration water and the results will be applied to the Southern Impoundment water treatment. Additionally, where data is not available for the Southern Impoundment, Northern Impoundment data will be used for characterization due to their similar characteristics. Results of the groundwater treatability testing were presented in Section 3.

The average TSS concentration in the Northern Impoundment simulated contact water sample was approximately 4,000 mg/L and will be used as the basis for the Southern Impoundment 30% RD.

This is expected to be a maximum value since in the treatability study, the waste solids were actively mixed with water for contact water creation, which would increase TSS concentrations. During the RA, best management practices will be used to reduce the volume of solids that are captured with contact water.

To evaluate the fraction of dioxins and metals that are associated with the suspended solids versus dissolved in the water, a water sample was filtered using an 0.45 micron filter and analyzed for dissolved dioxins and furans and metals. The majority of the metals and dioxins were determined to be associated with the solids and not dissolved.

5.4.1.2 Contact Water Volume and Treatment Rate

For the Southern Impoundment, contact water may be created via infiltration through the soil matrix (groundwater) or by stormwater into the excavations and may require treatment as a result. Based on results from PDI-2, groundwater was typically encountered at approximately 7 ft bgs. Based on the excavation depth of 10 ft, an excavation area could contain up to 3 ft of contact water associated with groundwater.

During the remedial action, the maximum expected excavation size that will be open at one time is estimated to be approximately 25 ft by 25 ft. As the basis of design, it is assumed that soil may be removed from no more than two separate excavation areas at one time (each with a estimated contact water volume of approximately 33,000 gallons), requiring up to 66,000 gallons of contact water storage capacity. Subject to obtaining access to the Musgrove property, it is anticipated that the contact water will be stored in multiple covered agitated tanks and treated (if needed) over a one day period, at a maximum treatment flow rate of approximately 300 gallons per minute (gpm).

5.4.1.3 Parameters Requiring Treatment

Discharge criteria were estimated assuming the receiving stream is the San Jacinto River. Treated and untreated contact water for the Northern Impoundment were compared to estimated discharge criteria. Dioxins and several metals were present in untreated contact water above estimated discharge criteria (in addition to suspended solids). For the Southern Impoundment, the parameters requiring treatment are assumed to be the same as the Northern Impoundment and include suspended solids, metals, and dioxins and furans with compliance with the ARAR determined using the ML of the EPA approved Method (1613B).

5.4.1.4 Compliance with Texas Surface Water Quality Standard Applicable or Relevant and Appropriate Requirement (ARAR)

As stated in Section 3.4, the EPA has made the determination regarding the ARAR for compliance with the TSWQS based on the substantive requirements of the state's regulation for surface water discharge. As detailed in e-mail correspondence dated February 18, 2020 (EPA, 2020), "EPA has determined that compliance with the TSWQS ARAR will be attained as follows:

- The state surface water quality standard for Dioxins/Furans is 7.97×10^{-8} µg/L [0.0797 pg/L] (as TCDD equivalents).

- Compliance with the TSWQS will be determined using the minimum level of the EPA approved method (1613B), cited in 40 CFR Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants), in sampling of surface water discharges during the Site remedial action.
- If an effluent sample analyzed for dioxin is below the minimum level using the EPA approved method, the sample result would be identified as non-detect and the discharge would be determined to be in compliance with the ARAR.

This approach is consistent with the state's guidance and other permits issued by the TCEQ."

5.4.2 Treatment System Design

A treatment train with multiple processes will be employed to reduce concentrations of suspended solids, dioxins and furans, and metals in the contact water. Based on the estimated volumes of water and the assumption that the soil removal will be completed in one working season (November to April), a temporary water treatment system is anticipated to be utilized during the RA. Details of the basis of design of the temporary water treatment system are provided below.

It should be noted that alternatives exist for the management of contact water, such as transportation and disposal at a POTW; however, those alternatives will be further evaluated later in the design process.

5.4.2.1 Major Equipment List and Sizing Basis

The major water treatment system components and basis of sizing are detailed in Table 10. This includes sizing criteria assumptions, preliminary design value, and notes for each major equipment and process component.

5.4.2.2 Temporary Water Treatment Equipment General Arrangement and Site Layout

It is contemplated that temporary water treatment systems for the Southern Impoundment will be staged on the west edge of the Southern Impoundment area, in close proximity to the San Jacinto River for potential discharge. Assuming that access to the Musgrove property is secured, an area of approximately 200 ft by 100 ft has been allocated for the staging of the Southern Impoundment temporary water treatment equipment. The area intended for temporary water treatment equipment is shown in Drawing P-04 and on the Southern Impoundment Overall Site Plan (Drawing C-03).

5.4.2.3 Potential Specification and Equipment Data Sheet List

As the detailed design progresses for the Southern Impoundment RA, the detailed design drawings associated with the temporary water treatment system will be supplemented with technical specifications detailing the potential water treatment equipment, consumables, staging/sequencing, and operation. The technical specifications that are expected to accompany the design drawings are listed in Section 7.2.

5.4.3 Operations and Maintenance Requirements

The temporary water treatment system associated with remediation of the Southern Impoundment will operate intermittently primarily based on need to treat contact water. A preliminary discussion of the operational and maintenance requirements (including consumables and utilities) associated with temporary water treatment is provided below.

5.4.3.1 Consumables

Effective treatment of contact water will require the use of several water treatment chemicals to facilitate solids separation, metals precipitation, and pH adjustment. A brief discussion of the water treatment chemicals that may be utilized is provided below.

Organosulfide - Organosulfide is a commonly used water treatment additive for the removal of metals (via sulfide precipitation). Organosulfide may be added depending on influent soluble metals concentrations. Precipitated metals will be removed through the solids separation processes of the temporary water treatment system. Required dosages will be confirmed based on on-Site jar testing. It is anticipated that organosulfide will be delivered to the work Site in intermediate bulk container (IBC) totes (~300 gallons).

Coagulant - Coagulants (such as ferric chloride or polyaluminum chloride) may be dosed to facilitate enhanced removal of metals (through co-precipitation) and suspended solids in the clarification process of the temporary water treatment system. Required dosages will be confirmed based on-Site jar testing. It is anticipated that coagulant will be delivered to the work Site in IBC totes (~300 gallons).

Acid/Caustic - Acid and/or caustic may be added to the contact water to adjust the water pH to optimize metals removal and enhance the effectiveness of the added coagulants. Required dosages will need to be confirmed based on-Site jar testing. It is anticipated that acid/caustic will be delivered to the work Site in IBC totes (~300 gallons).

Polymer - It is anticipated that liquid polymers will be utilized to enhance the settling of suspended solids and precipitated metals in the clarification step of the water treatment system. Polymer may also be required to enhance the settling/thickening of chemical sludge. Polymer will be activated/diluted prior to dosing into the water treatment process. Required dosages will be confirmed based on on-Site jar testing. It is anticipated that polymer will be managed in drums or IBC totes.

Nominal Rated Filters - Nominally rated filters (10 micron and 1 micron) will be configured downstream of the temporary treatment system multimedia filters. As the nominally rated filters are fouled (with captured solids), they will need to be removed and replaced.

Absolute Rated Filters - Absolute rated filters (1 micron) will be configured downstream of the temporary treatment system nominally rated filters. As the absolute rated filters are fouled (with captured solids), they will need to be removed and replaced.

Granular Activated Carbon (GAC) - The proposed GAC treatment vessels will be filled with bitumen based GAC media. The GAC vessels will be configured in a lead- lag arrangement. Effluent quality of the lead GAC vessel will be monitored for chemical breakthrough to identify the need for media replacement.

5.4.3.2 Power

The temporary water treatment system (as well as other facilities) in the Southern Impoundment will require electricity for operation. The estimated electrical load for the Southern Impoundment temporary water treatment system is 100 kilowatts (kW), 480 volts (V), 3 Phase. A 480 V power service will be required in the vicinity of the Southern Impoundment. The contractor executing the water treatment system installation will have flexibility to step down the power service (i.e., to 120 V, etc.) as needed for minor electrical loads, trailers, etc.

5.4.3.3 Labor

The temporary water treatment system is expected to operate in a semi-automatic mode of operation. Key process decisions and operations will be executed with the oversight of the contractor's treatment system operators. It is expected that operation of the temporary water treatment system will require one to three operators, depending on the activities being performed. The need for licensed wastewater treatment operators for the temporary water treatment system is currently being evaluated. The water treatment system will operate primarily during precipitation events; thus, there may be extended periods of time in which the water treatment system is idle and treatment system operators are not required.

5.4.3.4 Residuals

The operation of the temporary water treatment system will result in the generation of a number of residuals. A discussion of the residuals resulting from temporary water treatment is provided below.

Chemical Sludge: The contact water is expected to contain solids from the waste material in the excavation. The addition of coagulants, organosulfide, and polymer will result in the precipitation of metals and removal of suspended solids. The resulting chemical sludge will be withdrawn as the underflow of the inclined plate clarifier. The chemical sludge will be directed to a gravity thickener tank where it is estimated that it will be thickened to a solids concentration of 6 (weight) %. As previously noted, polymer may need to be added to enhance the thickening effect. During operation of the temporary water treatment system, thickened chemical sludge will be generated at a rate of 600 pounds per hour (lbs/hr) (dry solids basis). This thickened sludge will be directed to holding tanks prior to solidification with other impacted soils/solids from the work Site.

Spent Filter Elements: As previously noted, the nominally rated and absolute rated filter elements will become fouled with solids as the treatment system operates. These fouled elements will need to be removed and replaced.

Exhausted GAC Media: GAC media has a finite capacity to remove dissolved constituents (including metals and dioxins and furans) from water. As previously noted, the GAC vessels will be operated in a lead-lag configuration. The discharge of both the lead and lag GAC vessels will be monitored to identify when the GAC media is exhausted. When concentrations of constituents of concerns are detected at elevated levels in the lead GAC vessel, the media in this vessel will be removed and replaced. Once back in service, this vessel will become the lag vessel.

5.5 Monitoring and Controls

5.5.1 Control of Dust and Emissions

The contractor will be required to use methods that minimize raising dust from construction operations. The contractor may be instructed to use potable water for potential misting operations to provide positive means to prevent airborne dust from dispersing into the atmosphere. Detailed specifications for perimeter dust monitoring and associated controls will be developed later in the design process.

5.5.2 SWPPP and BMPs

During the time an excavation is open, it will need to be maintained to be free of water as much as possible. Measures that may be adopted in that regard may include requiring that the immediate area surrounding any excavation be graded to drain surface water away from the excavation or that other controls, such as berm construction be used to prevent water from entering the excavation. Those measures may also include requiring that any surface water in areas adjacent to an excavation be directed to existing surface drainage systems together with requirements that existing surface drainage systems be kept open and operational.

In addition to surface water control outside the excavation limits, the contractor will provide, operate, and maintain necessary dewatering equipment appropriately sized to maintain an excavation to be free of water, as much as possible, both precipitation landing within the excavation area and inflowing groundwater, if present. Requirements may be imposed on the contractor that the pumping equipment, machinery, and tankage be in good working condition for potential emergencies, including power outages, and that appropriately trained workers be employed to operate the pumping equipment. All water removed from any open excavation is to be contained, collected, and then transferred to staged water storage tanks for eventual treatment and discharge.

Excavation dewatering may employ methods such as sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and any other measures necessary to enable the removal of soils to be carried out in the dry. The contractor will be required to use best management practices (BMPs) for the provision of all dewatering and water removal activities. A Stormwater Pollution Prevention Plan (SWPPP) will be developed in combination with the property owner(s), engineer, and contractor for the Southern Impoundment excavation program prior to commencement of any soil removal work.

6. Environmental Footprint (Greener Cleanups)

The Southern Impoundment RD will consider the EPA's *Principals for Greener Cleanups (August 2009)*. The EPA and state agencies have developed a framework outlining the desired outcomes of a potential standard for greener cleanups. The framework focuses on five principals associated with a cleanup project's environmental footprint. These principals are listed below along with the potential methods in which they may be incorporated into the Southern Impoundment RD.

Minimizing Total Energy Use and Maximize Use of Renewable Energy. Reducing total energy use while also identifying means to increase the use of renewable energies throughout the clean-up. This principal may be incorporated into the RD by:

- Limiting traffic at the work Site by requiring workers to carpool to the work Site.
- Requiring the contractor to use energy efficient equipment or vehicles where applicable.

Minimizing Air Pollutants and Greenhouse Gas Emissions. Reducing total air emissions, including emissions of air pollutants and greenhouse gases, throughout the clean-up. This principal may be incorporated into the Southern Impoundment RD by:

- Specifying that the contractor control dust emissions in and around the work Site and on Market Street.
- Requiring air emission control devices on equipment that delivers solidification agents.
- Specifying the use of electricity at the work Site rather than portable diesel generators where applicable.

Minimizing Water Use and Impacts to Water Resources. Minimizing the use of water and impacts to water resources throughout the clean-up. This principal may be incorporated into the Southern Impoundment RD by:

- Employing BMPs for stormwater, erosion, and sedimentation control.

Reduce, Reuse, and Recycle Materials and Waste. Minimizing the use of virgin materials and generation of waste throughout the clean-up as well as maximizing the use of recycled materials. This principal may be incorporated into the Southern Impoundment RD by:

- Implementing a recycle program for workers.
- Requiring contractors to consider recycled material when purchasing material for the project.

Protect Land and the Environment. Reducing impacts to land and the environment throughout the clean-up. This principal may be incorporated into the Southern Impoundment RD by:

- Minimizing the footprint of disturbed areas within the work Site, to the extent practicable.
- Including pollinators and/or native sustainable gasses in the cover design for the vegetated areas.

7. Preliminary Drawings and Specifications

7.1 Design Drawings

The Preliminary (30%) RD design drawings for the Southern Impoundment are presented in Appendix D and include the following preliminary drawings:

- Drawing C-01 - Overall Site Plan
- Drawing C-02 - Existing Conditions
- Drawing C-03 - Site Works

- Drawing C-04 - Soil Erosion and Sediment Control Plan
- Drawing C-05 - Soil Erosion and Sediment Control Details
- Drawing C-06 - Project Traffic Control Plan
- Drawing C-07 - Excavation Plan 1 of 3
- Drawing C-08 - Excavation Plan 2 of 3
- Drawing C-09 - Excavation Plan 3 of 3
- Drawing C-10 - Excavation Sections
- Drawing C-11 - Sheet Pile Layout
- Drawing C-12 - Sheet Pile Plan and Profile
- Drawing C-13 - Sheet Pile Details
- Drawing C-14 - Typical Details 1 of 3
- Drawing C-15 - Typical Details 2 of 3
- Drawing C-16 - Typical Details 3 of 3
- Drawing P-01 - Water Treatment System Process Flow Diagram Mass Balance
- Drawing P-02 - Water Treatment System P&ID (1 of 2)
- Drawing P-03 - Water Treatment System P&ID (2 of 2)
- Drawing P-04 - Water Treatment System Site Plan

These drawings, insofar as they reflect use of specific means and methods for carrying out the Site work, are preliminary and may be modified as the design process proceeds and means and methods for performing the Southern Impoundment remedy are further defined.

7.2 Preliminary Technical Specifications

To supplement the Preliminary (30%) RD design drawings for the Southern Impoundment, a preliminary list of technical specifications has been identified. As the design progresses from Preliminary (30%) to Pre-Final (90%), these specifications will be further developed and determinations may be made that additional specifications are required.

- Section 01 00 00 - General Requirements
- Section 01 35 00 - Temporary Traffic Controls
- Section 01 35 29 - Health and Safety
- Section 01 50 00 - Temporary Facilities and Controls
- Section 01 57 13 - Temporary Soil Erosion and Sediment Controls
- Section 22 05 01 - Mechanical General Requirements
- Section 31 10 00 - Site Clearing
- Section 31 23 16 - Excavation

- Section 31 23 23 - Fill
- Section 31 41 16 - Sheet Piles
- Section 32 31 13 - Chain Link Fences and Gates
- Section 32 92 19 - Seeding
- Section 40 05 13 - Common Work Results for Process Piping
- Section 40 05 51 - Common Requirements for Process Valves
- Section 46 05 01 - Process Equipment General Requirements
- Section 46 07 01 - Temporary Water Treatment System

8. Supporting Deliverables

Drafts of supporting deliverables have been prepared as part of the Southern Impoundment 30% RD. These deliverables will be updated as additional details of the project implementation are developed during the subsequent phases of the design.

8.1 Construction Health and Safety Plan

The Construction HASP (Attachment 1 in Appendix C) has been prepared in accordance with CFR 1910 and 1926 to provide protection of human health and the environment during all activities performed. As further developed, it will include all physical, chemical and all other hazards posed by the work required to perform the Southern Impoundment RD.

8.2 Emergency Response Plan

The ERP (Attachment 2 in Appendix C) describes procedures to be used in the event that there is an emergency at the work Site. This includes the entity(ies) responsible for responding to an emergency, the plan for meeting with those involved in the response, contingency plans for spills, and release reporting and response. The ERP also includes a High Water Preparedness Plan that describes the weather monitoring procedures and the emergency actions that will be taken during a potential high water event.

8.3 Field Sampling Plan

The FSP (Attachment 3 in Appendix C) describes the sampling activities for all media to be sampled at the work Site. The FSP will detail the sample locations and describe the protocol for sample handling and analysis.

8.4 Quality Assurance Project Plan

The QAPP (Attachment 4 in Appendix C) provides an explanation of the quality assurance and quality control procedures and chain-of-custody procedures for all sampling at the work Site. This includes quality assurance during data generation and acquisition and during data validation and review.

8.5 Site Wide Monitoring Plan

The SWMP (Attachment 5 in Appendix C) describes the procedures to obtain information on the contamination levels at the work Site throughout the remedial process and to demonstrate whether the Performance Standards for the Southern Impoundment are achieved.

8.6 Construction Quality Assurance/Quality Control Plan

The CQA/CQP (Attachment 6 in Appendix C) describes the planned and systemic activities that verify that the remedial construction in the Southern Impoundment will achieve clean-up goals and performance requirements set forth in the ROD.

8.7 Transportation and Off-Site Disposal Plan

The TODP (Attachment 7 in Appendix C) details, for the Southern Impoundment, waste characterization activities and the planned disposal facilities. It describes the transportation routes for off-Site shipments from the Southern Impoundment, identify procedures to protect any communities that may be affected by the shipments, and describe the procedures for on-Site management and loading of the waste materials.

8.8 Institutional Controls Implementation and Assurance Plan

The ICIAP (Attachment 8 in Appendix C) describes the institutional controls applicable to the Southern Impoundment. The ICIAP also provides the procedures to implement, maintain, and enforce the institutional controls.

8.9 Operation & Maintenance Manual

Per discussion with the EPA, this plan is not anticipated to be necessary based on the RD of the selected remedy.

8.10 Operation & Maintenance Plan

Per discussion with the EPA, this plan is not anticipated to be necessary based on the RD of the selected remedy.

9. References

EPA, 2017. Record of Decision, San Jacinto River Waste Pits. Harris County, Texas. EPA ID: TXN000606611. U.S. Environmental Protection Agency, Region 6. Dallas, Texas. October 2017.

EPA, 2018a. Administrative Settlement Agreement and Order on Consent for Remedial Design. U.S. EPA Region 6, CERCLA Docket. No. 06-02-18. In the matter of: San Jacinto Waste Pits Superfund Site, Harris County, Texas. International Paper Company and McGinnes Industrial Maintenance Corporation, Respondents. April 2018.

EPA. 2018b. Letter to C. Patmont, Anchor QEA, regarding approval of First Phase Pre-Design Investigation Work Plan, dated September 12, 2018. U.S. Environmental Protection Agency.

EPA, 2018c. Letter to C. Munce, GHD Services Inc., regarding approval of Submission Date for Draft Second Phase Pre-Design Investigation Work Plan and Draft Treatability Study Work Plan, dated December 18, 2018. U.S. Environmental Protection Agency.

EPA, 2019a. Letter to C. Munce, GHD Services Inc., regarding comments on the Draft Second Phase Pre-Design Investigation Work Plan, dated April 18, 2019. U.S. Environmental Protection Agency.

EPA, 2019b. Letter to C. Munce, GHD Services Inc., regarding comments on the Draft Treatability Study Work Plan, dated April 18, 2019. U.S. Environmental Protection Agency.

EPA, 2019c. Letter to C. Munce, GHD Services Inc., regarding approval of Final Second Phase Pre-Design Investigation Work Plan, dated August 8, 2019. U.S. Environmental Protection Agency.

EPA, 2019d. Letter to C. Munce, GHD Services Inc., regarding approval of Final Treatability Study Work Plan, dated August 27, 2019. U.S. Environmental Protection Agency.

EPA, 2019e. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Second Phase Pre-Design Investigation Work Plan Refinement Notice, dated October 11, 2019. Approval received from G. Baumgarten on October 22, 2019. GHD Services Inc.

EPA, 2019f. Letter to C. Munce, GHD Services Inc., regarding approval of Force Majeure Event, dated October 30, 2019. U.S. Environmental Protection Agency.

EPA, 2019g. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Second Phase Pre-Design Investigation Work Plan Third Refinement Notice, dated November 8, 2019. Approval received from G. Baumgarten on November 14, 2019. GHD Services Inc.

EPA, 2020. Baumgarten, Gary, U.S Environmental Protection Agency. “Re: San Jacinto River Waste Pits - Surface Water Quality Standard.” Received by Judy Armour, Nicholas Casten, Katie Delbecq, Satya Dwivedula, Anne Foster, Karl Gustavson, Monica Harris, Ashley Howard, John Meyer, Charles Munce, Brent Sasser, Paul Schroeder, Phillip Slowiak, Janie Smith. February 18, 2020. E-mail.

Integral and Anchor QEA, 2013a. *Baseline Human Health Risk Assessment*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. May 2013.

Integral and Anchor QEA, 2013b. *Remedial Investigation Report*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. May 2013.

Integral and Anchor QEA, 2018a. *Draft First Phase Pre-Design Investigation Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. June 2018.

Integral and Anchor QEA, 2018b. *First Phase Pre-Design Investigation Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. August 2018.

Integral and Anchor QEA, 2018c. *Draft Remedial Design Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. September 2018.

Integral and Anchor QEA, 2018d. *Addendum to the First Phase Pre-Design Investigation Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. October 2018.

Integral and Anchor QEA, 2018e. *Remedial Design Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. December 2018.

GHD, 2018. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Schedule Extension and Approval of Submission Date - Draft Treatability Study Work Plan and Draft Second Phase Pre-Design Investigation Work Plan, dated December 7, 2018. GHD Services Inc.

GHD, 2019a. *Draft Second Phase Pre-Design Investigation Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. February 11, 2019.

GHD, 2019b. *Draft Treatability Study Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. February 11, 2019.

GHD, 2019c. *Final Treatability Study Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. May 20, 2019.

GHD, 2019d. *Final Second Phase Pre-Design Investigation Work Plan*, San Jacinto River Waste Pits Superfund Site. Prepared for McGinnes Industrial Maintenance Corporation, International Paper Company, and U.S. Environmental Protection Agency, Region 6. June 3, 2019

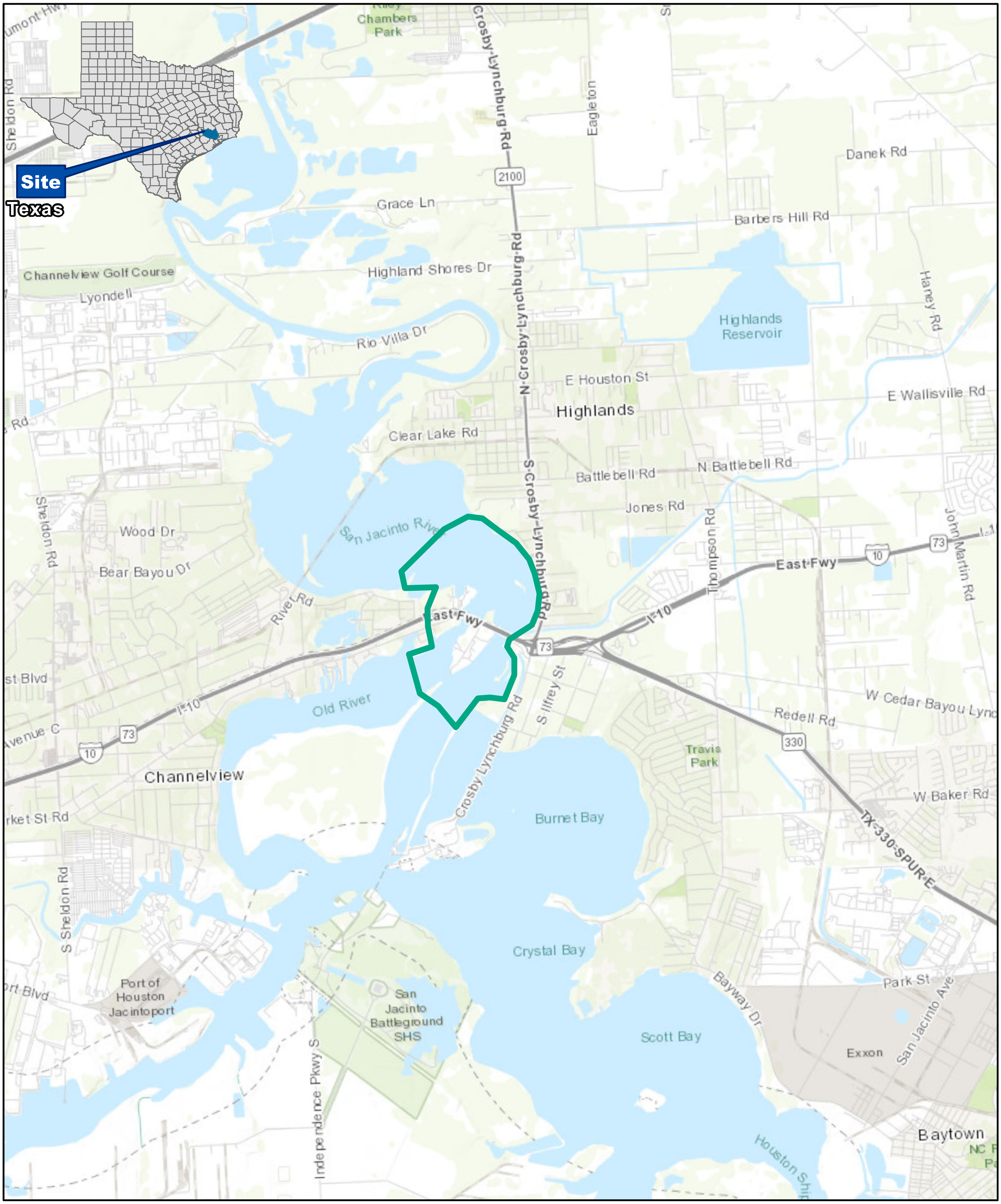
GHD, 2019e. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Written Notification of Force Majeure Event, dated September 27, 2019. GHD Services Inc.

GHD, 2019f. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Second Phase Pre-Design Investigation Work Plan Refinement Notice, dated October 11, 2019. GHD Services Inc.

GHD, 2019g. Letter to G. Baumgarten, U.S. Environmental Protection Agency, regarding Second Phase Pre-Design Investigation Work Plan Third Refinement Notice, dated November 8, 2019. GHD Services Inc.

GHD

Charles W. Munce, P.E.



Source: ESRI World Topographic Maps.

0 0.5 1
Miles

Coordinate System:
NAD 1983 UTM Zone 14N

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN -
SOUTHERN IMPOUNDMENT

VICINITY MAP

11187072
Apr 10, 2020

FIGURE 1

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR001.mxd

Source: ESRI World Imagery Basemap Services. 9/9/2017. Assumed limits of the TCRA cap. Extracted from 0557-RP-001 (Buoy Anchors).dwg file extracted from Anchor QEA April 2019.

0 625 1,250
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

11187072
Apr 10, 2020

SITE PLAN

FIGURE 2

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR002.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 70 140
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

11187072
Apr 10, 2020

SOUTHERN IMPOUNDMENT

FIGURE 3

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR003.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet

Coordinate System:
NAD 1983 StatePlane Texas South
Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

FIRST PHASE PRE-DESIGN
INVESTIGATION BORING LOCATIONS

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FIGURE 4

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR004.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

11187072
Apr 13, 2020

FIRST PHASE PRE-DESIGN INVESTIGATION RESULTS

FIGURE 5

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR005.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

SECOND PHASE PRE-DESIGN INVESTIGATION BORING LOCATIONS

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FIGURE 6

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR006.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

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SECOND PHASE PRE-DESIGN INVESTIGATION RESULTS

FIGURE 7

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR007.mxd

Notes:
ng/kg = nanograms per kilogram
1) dwa = depth weighted average
2) >240 ng/kg represents an exceedance for a boring's dwa.
3) For the areas requiring soil removal near Market Street and the Glendale Boat Works, Inc. property, the lateral limits of the excavation will extend immediately up to Market Street and the Glendale Boat Works, Inc. property limits however; the excavation will not extend into either the street or onto the Glendale Boat Works, Inc. property.
4) For the areas requiring soil removal on the southwest portion of the Southern Impoundment, a bulkhead will be installed adjacent to the San Jacinto River. Excavation will be completed up to the lateral limit of the bulkhead.
5) A survey will be conducted to confirm the boundaries of the Market Street right-of-way, Glendale Boat Works property and other properties necessary to implement the design.

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet
Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

THIESSEN POLYGONS

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FIGURE 8

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR008.mxd

Source: Image ©2020 Google, Imagery date: 10/28/2017

0 62.5 125
Feet

Coordinate System:
NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

N

GHD

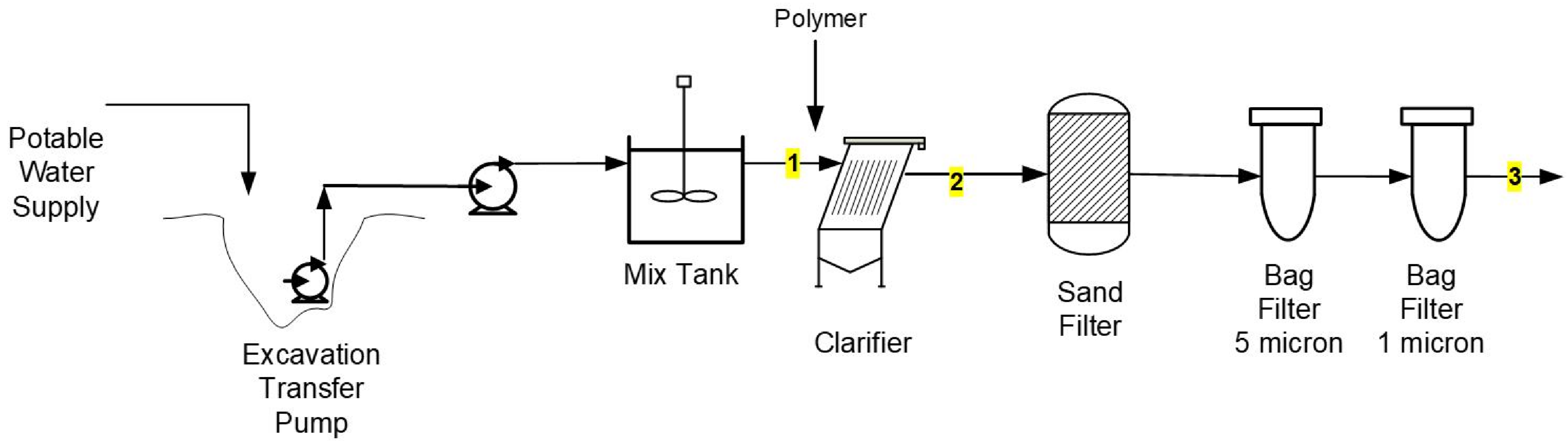
SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS
PRELIMINARY 30% REMEDIAL DESIGN - SOUTHERN IMPOUNDMENT

11187072
Apr 10, 2020

TREATABILITY SAMPLE LOCATIONS

FIGURE 9

GIS File: I:\GIS\GIS\Projects\11180000s\11187072\Layouts\REPORT_012\11187072-00(REPORT_012)GIS-BR009.mxd



		Sample Point		
		1	**2**	**3**
Parameter		**Contact Water (average)**	**Clarifier Effluent**	**Filter Effluent**
2,3,7,8 TCDD	pg/L	16,500	13	<10
Copper	mg/L	0.10	0.0081 U	0.0081 U
Lead	mg/L	0.11	0.0022 U	0.0022 U
Zinc	mg/L	0.38	0.045	0.036
TSS	mg/L	4,050	11	2

Notes:
pg/L = pictogram per liter
mg/L = milligram per liter
TCDD = 2,3,7,8-Tetrachlorodibenzodioxin
TSS = total suspended solids
U = not detected at the associated reporting limit

1) The Minimum Level (ML) for 2,3,7,8 TCDD is 10 pg/L
2) Full analytical data set included in Table 6.
Lab Reports included in Appendix B

PILOT TEST PROCESS FLOW DIAGRAM

FIGURE 10

Table 1

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB008-N1-Composite	SJSB012-N1-Composite	SJSB019-N1-Composite	SJSB019-N1-Composite	SJSB023-N1-Composite	SJSB025-N1-Composite
Sample Identification:		SL0153	SL0146	SL0022	SL0022	SL0064	SL0084
Sample Date:		11/13/2018	11/13/2018	11/3/2018	11/13/2018	11/5/2018	11/8/2018
Sample Depth:		(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs
Integral Sample ID:		SJSB008-N1-C6	SJSB012-N1-C6	SJSB019-N1-C6	SJSB019-N1-C6	SJSB023-N1-C6	SJSB025-N1-C6
TCLP-Volatile Organic Compounds (VOCs)							
1,1,2,2-Tetrachloroethane	mg/L	0.04 U	0.04 U	0.04 U	--	0.04 U	0.04 U
1,1-Dichloroethene	mg/L	0.032 U	0.032 U	0.032 U	--	0.032 U	0.032 U
1,2-Dichloroethane	mg/L	0.032 U	0.032 U	0.032 U	--	0.032 U	0.032 U
1,4-Dichlorobenzene	mg/L	0.048 U	0.048 U	0.048 U	--	0.048 U	0.048 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	0.76 UJ	0.76 UJ	0.76 UJ	--	0.76 UJ	0.76 UJ
Benzene	mg/L	0.025 U	0.025 U	0.025 U	--	0.025 U	0.025 U
Carbon tetrachloride	mg/L	0.039 U	0.039 U	0.039 U	--	0.039 U	0.039 U
Chlorobenzene	mg/L	0.044 U	0.044 U	0.044 U	--	0.044 U	0.044 U
Chloroform (Trichloromethane)	mg/L	0.029 U	0.029 U	0.029 U	--	0.029 U	0.029 U
Tetrachloroethene	mg/L	--	--	--	--	0.04 U	--
Trichloroethene	mg/L	0.04 U	0.04 U	0.04 U	--	0.03 U	0.04 U
Vinyl chloride	mg/L	0.03 U	0.03 U	0.03 U	--		0.03 U
TCLP-Semi-Volatile Organic Compounds (SVOCs)							
2,4,5-Trichlorophenol	mg/L	0.011 UJ	0.014 UJ	0.0087 UJ	--	0.0087 UJ	0.0087 U
2,4,6-Trichlorophenol	mg/L	0.0084 UJ	0.011 UJ	0.0069 UJ	--	0.0069 UJ	0.0069 UJ
2,4-Dinitrotoluene	mg/L	0.016 UJ	0.021 UJ	0.013 UJ	--	0.013 UJ	0.013 U
2-Methylphenol	mg/L	0.011 UJ	0.014 UJ	0.0086 UJ	--	0.0086 UJ	0.0086 U
4-Methylphenol	mg/L	0.0058 UJ	0.0074 UJ	0.0047 UJ	--	0.0047 UJ	0.0047 U
Hexachlorobenzene	mg/L	0.012 UJ	0.015 UJ	0.0094 UJ	--	0.0094 UJ	0.0094 U
Hexachlorobutadiene	mg/L	0.0078 UJ	0.01 UJ	0.0064 UJ	--	0.0064 UJ	0.0064 U
Hexachloroethane	mg/L	0.0058 UJ	0.0075 UJ	0.0048 UJ	--	0.0048 UJ	0.0048 U
Nitrobenzene	mg/L	0.0097 UJ	0.013 UJ	0.0079 UJ	--	0.0079 UJ	0.0079 U
Pentachlorophenol	mg/L	0.014 UJ	0.017 UJ	0.011 UJ	--	0.011 UJ	0.011 U
Pyridine	mg/L	0.31 UJ	0.4 UJ	0.25 UJ	--	0.25 UJ	0.25 U
TCLP-Pesticides							
Chlordane	mg/L	0.001 U	0.001 UJ	0.001 UJ	--	0.001 UJ	0.001 UJ
Endrin	mg/L	0.0001 U	0.0001 UJ	0.0001 UJ	--	0.0001 UJ	0.0001 UJ
gamma-BHC (lindane)	mg/L	0.0001 U	0.0001 UJ	0.0001 UJ	--	0.0001 UJ	0.0001 UJ
Heptachlor	mg/L	0.0001 U	0.0001 UJ	0.0001 UJ	--	0.0001 UJ	0.0001 UJ
Heptachlor epoxide	mg/L	0.0001 U	0.0001 UJ	0.0001 UJ	--	0.0001 UJ	0.0001 UJ
Methoxychlor	mg/L	0.0001 U	0.0001 UJ	0.0001 UJ	--	0.0001 UJ	0.0001 UJ
Toxaphene	mg/L	0.002 U	0.002 UJ	0.002 UJ	--	0.002 UJ	0.002 UJ
TCLP-Herbicides							
2,4,5-TP (Silvex)	ug/L	25 U	32 U	20 UJ	--	20 UJ	20 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	ug/L	130 U	160 U	100 UJ	--	100 UJ	100 U
TCLP-Metals							
Arsenic	mg/L	0.02 U Dup 0.02 U	0.02 U	0.02 U Dup 0.02 U	--	0.02 U	0.02 U Dup 0.02 U
Barium	mg/L	0.9 J Dup 0.8 J	0.7 J	0.9 J Dup 0.9 J	--	1.3	1.1 Dup 1
Cadmium	mg/L	0.004 J Dup 0.004 J	0.001 U	0.011 J Dup 0.011 J	--	0.003 J	0.002 J Dup 0.002 J
Chromium	mg/L	0.01 U Dup 0.01 U	0.01 U	0.01 U Dup 0.01 U	--	0.01 U	0.01 U Dup 0.01 U
Lead	mg/L	0.015 U Dup 0.015 U	0.015 U	0.015 U Dup 0.015 U	--	0.024 J Dup 0.025 J	0.015 U Dup 0.015 U
Mercury	mg/L	0.0001 U Dup 0.0001 U	0.0001 U	0.0001 U Dup 0.0001 U	--	0.0001 U	0.0001 U Dup 0.0001 U
Selenium	mg/L	0.02 U Dup 0.02 U	0.02 J	0.02 U Dup 0.02 U	--	0.02 U	0.02 U Dup 0.02 U
Silver	mg/L	0.004 U Dup 0.004 U	0.004 U	0.004 U Dup 0.004 UJ	--	0.004 U	0.004 U Dup 0.004 U
Misc							
Asbestos	%	0	0	0	--	0 Dup 0.25	0
Total Petroleum Hydrocarbons (TPH)							
Total Petroleum Hydrocarbons	mg/kg	--	--	22 J	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	8.1 J	1300 J	22 J	--	340 J Dup 430 J	33 J
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	60 J	1500 J	--	--	510 J Dup 600 J	130 J
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	8.5 U	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	30 Dup 1.4 J	52 J	6.5 U	--	8.3 Dup 14	1.7 J
General Chemistry							
Cyanide (total)	mg/kg	17 U Dup 17 U	--	17 UJ	--	17 UJ	17 UJ
Flash point (closed cup)	Deg C	110 > Dup 110 >	110 >	--	110 >	> 110	110 >
Moisture	%	--	--	24 J	--	26 J Dup 36 J	22 J Dup 21.5
Percent solids	%	--	--	--	76.7	--	--
pH, lab	s.u.	8.33 J	9.62 J	8.52 J	--	8.15 J Dup 8.29 J	8.13 J
Reactive cyanide	mg/kg	--	--	--	100 U	--	--
Sulfate	mg/kg	--	746 J Dup 659	--	--	--	--
Sulfide	mg/kg	39 U	98	32 U	--	32 U	32 U Dup 32 U
Sulfur	mg/kg	--	2600	--	--	--	--
Total solids	%	82 Dup 80.8 Dup 69.1	65.2	73.9 Dup 76.7 J	--	74.9 J Dup 65.3 J	74.3 Dup 77.5 Dup 76.4 Dup 77.5

Notes:
TCLP - Toxicity Characteristic Leaching Procedure
mg/L - milligrams per Liter
ug/L - microgram per Liter
Deg C - Degrees in Celsius
s.u. - standard unit

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB008-E1-Composite	SJSB008-N1-Composite	SJSB008-S1	SJSB008-S1	SJSB008-S1	SJSB008-S1	SJSB008-S1	SJSB008-S1-Composite	SJSB008-S2	SJSB008-S2	SJSB008-S2	SJSB008-S2	SJSB008-S2	SJSB008-W1-Composite	SJSB012-E1-Composite	SJSB012-E1-Composite	SJSB012-N1	SJSB012-N1
Sample Identification:		SL0078	SL0153	SL0170	SL0171	SL0172	SL0173	SL0174	SL0175	SL0176	SL0177	SL0178	SL0179	SL0180	SL0164	SL0100	SL0101	SL0141	SL0142
Sample Date:		11/7/2018	11/13/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/13/2018	11/10/2018	11/10/2018	11/13/2018	11/13/2018
Sample Type:																	Duplicate		
Sample Depth:		(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs
Integral Sample ID:		SJSB008-E1-C6	SJSB008-N1-C6	SJSB008-S1-C1	SJSB008-S1-C2	SJSB008-S1-C3	SJSB008-S1-C4	SJSB008-S1-C5	SJSB008-S1-C6	SJSB008-S2-C1	SJSB008-S2-C2	SJSB008-S2-C3	SJSB008-S2-C4	SJSB008-S2-C5	SJSB008-W1-C6	SJSB012-E1-C6	SJSB012-E1-C6 (Field split	SJSB012-N1-C1	SJSB012-N1-C2
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	238	142	153	29.1	163	3510	11100	2100	119	64.5	81.8	55.1	414	60.8	753	337	28.8	85.2
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	2060 J	1510	2870	639	7700 J	36300	4810	4300	2060	1030	2160	108000 J	37500	1270	2960	1380	72700 J	2770
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	22.3 J	19.5	32.2	4.89 U	38.5	512	145	99.8	25.5	9.44 U	16	7.03	776	11.7	21.4	12.5	9.67	21.7
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	105	69.6	195	26.1	149	573	232	193	97	45.5	84.4	319	384	53.1	56.9	33.9	200	157
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	2.31 J	2.35 J	3.41	0.436 U	3.96 U	153	14.9	20.5	3.18	0.844 J	2.97 U	3.11 U	335	1.54 J	2.25 J	2.03 J	0.6 U	2.91 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	11.9	4.59	6.01	1.03 J	15.4	1410	34.9	153	7.56	2.33 U	4.35	0.965 J	3570	6.3	10.3	9.28	0.618 U	1.44 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.772 U	1.01 J	1.97 J	2.89 U	1.26 U	3.33 U	3.42 J	1.64 J	1.11 U	0.698 U	0.962 J	1.26 J	1.6 U	0.812 J	0.575 J	3.25 U	1.98 J	0.807 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.25	1.26 J	1.93 U	0.6 U	4.18	349	10.9	37.8	2.46 J	0.916 U	1.17 U	0.741 U	870	1.67 J	2.82 U	2.45 U	0.547 U	1.23 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	3.67	3.8	6.61	1.53 J	6.87	21.6	15	7.45	5.11	3.08	3.36	4.71	10.6	2.32 U	2.24 J	1.14 U	3.97	4.43
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.09 J	0.796 U	0.756 U	2.89 U	1.47 U	119	5.26	12.1	0.634 U	0.475 U	0.847 J	0.452 U	303	0.588 J	1.07 U	1.03 J	3.19 U	2.91 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.2 J	1.77 U	3.08 U	0.875 U	3.1 U	8.62	8.23	3.52 U	2.96 U	1.96 U	2.6 J	3.99 U	4.54 J	1.93 J	1.56 U	0.814 U	3.61	2.11 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	7.66	1.61 J	2.38 J	0.653 U	8	836	23.2	89.6	2.92 J	1.26 U	2.39 J	0.638 U	2110	3.09	6.62	5.41	0.269 U	0.494 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.04 U	0.403 U	1.73 U	0.473 J	0.889 U	83.1	6.51 U	10.5	1.26 U	1.04 U	1.25 U	1.17 U	141	0.935 U	1.56 J	1.09 U	1.21 J	0.707 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.53 U	1.11 U	2.43 J	0.317 U	2.64 J	72.7	7.56	9.82	2.05 J	0.922 U	1.2 J	0.818 J	158	1.02 J	1.54 J	0.969 J	0.691 U	1.59 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	5.76	0.867 U	2.71 U	2.89 U	7.26	644	28.5	79.2	2.9 J	1.42 J	2.27 J	0.742 U	1550	3.17	7.24	5.39	0.571 J	1.25 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	189	21.3	43.8	22.8	165	26800	818	5350	39.4	29	45.5	3.27	62500	100	271	208	2.88	2.87
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	57.5	8.6 U	24.4	8.74	88.2	22100	609	3120	17.5 U	11.6	24.8	1.89	41600	48.8	88.8	70.9	1.27 U	1.4
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	238	142	153	29.1	163	3510	11100	2100	119	64.5	81.8	55.1	414	60.8	753	337	28.8	85.2
Total dioxin/furan	pg/g	2710	1780	3340	729	8350	93500	17900	15600	2370	1190	2430	108000	152000	1560	4180	2070	73000	3050
Total dioxin/furan (ND*0.5)	pg/g	2710	1780	3350	733	8350	93500	17900	15600	2380	1200	2430	108000	152000	1570	4190	2070	73000	3050
Total dioxin/furan (ND*1)	pg/g	2710	1790	3350	737	8360	93500	17900	15600	2390	1200	2430	108000	152000	1570	4190	2080	73000	3050
Total heptachlorodibenzofuran (HpCDF)	ng/kg	74	46.6	103	2.89 U	121	970	333	226	66.7	18.7	52.6	28.1	1400	35.2	47.7	27.6	24.6	76.9
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	292	168	805	70.6	361	1270	589	597	239	127	239	1030	823	153	166	92.7	528	500
Total hexachlorodibenzofuran (HxCDF)	ng/kg	36.9	19.1	24.5	4.86	53.9	2210	166	266	35.7	0.62 J	21	9.57	5300	18.4	28.4	16	9	25.9
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	40	30.5	103	9.9	49.6	211	159	82	25.7	23.2	37.6	212	131	36.2	37.4	17.1	51.4	39.1
Total pentachlorodibenzofuran (PeCDF)	ng/kg	27.6	8.66	12.7	0.838 J	25.1	2360	143	270	18.7	3.52	12.6	4.12	5620	13.5	29.7	21.5	1.03 J	11.5
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.85 J	3 U	1.67 J	1.07 J	2.69 U	111	10.3	16.6	1.98 J	2.76 U	3.82	13.9	175	3.92	4.68	1.48 J	3.22	2.19 J
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	256	27.7	72.8	32.5	266	49900	1470	8590	54	43.2	74.9	17.9	107000	154	371	287	13.5	7.29
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	73.3	7.55	31.1	10.8	105	24100	680	3470	15.1	15	30.7	15	46300	57.7	110	87.2	11	4.1
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	255	22.6	70.3	32.2	265	49900	1470	8590	44.5	42.2	74.3	16.6	107000	154	371	286	12.7	6.9
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	257	32.8	75.3	32.9	266	49900	1470	8590	63.6	44.2	75.6	19.1	107000	155	372	288	14.2	7.68
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	72.5	2.73	29.5	10.6	104	24100	677	3470	5.43	14	30	14.1	46300	57.2	110	85.7	10.3	3.72
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	74.1	12.4	32.8	11	106	24100	683	3470	24.8	16	31.4	15.8	46300	58.2	110	88.7	11.8	4.48
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	81.9	3.28	30.6	11.5	112	25400	715	3730	7.25	15.5	31.9	2.99	49300	61.8	122	95.8	2.13	3.47
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	82.2	8.08	32	11.7	112	25400	716	3730	16.6	16.2	32.3	3.75	49300	62.1	122	96.4	2.88	3.67
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	82.6	12.9	33.4	11.9	113	25400	718	3730	25.9	16.8	32.7	4.5	49300	62.5	123	97.1	3.63	3.87
Total tetrachlorodibenzofuran (TCDF)	ng/kg	317	29.4	65.3	32.3	272	39400	2000	5650	54	33.3	79.6	11	92000	168	478	367	5.76	5.91
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	66.8	1.02	25.3	8.74	92.9	12400	540	1620	1.58 U	11.6	27.6	4.35	25100	58.9	101	77.4	0.638 U	1.18
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	82.6	4.65	33.8	12.2	114	25300	717	3720	8.53	16	33.1	38.7	49000	62.1	123	95.6	26.5	5.87
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	83.2	9.47	35.3	12.4	115	25300	721	3720	18.1	17	33.8	39.6	49000	62.7	123	96.5	27.3	6.24
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	83.8	14.3	36.9	12.6	116	25300	724	3720	27.8	17.9	34.5	40.6	49000	63.3	124	97.5	28	6.61
Asbestos																			
Asbestos	%	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	10 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	3.2 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	69.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	59.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	8.1 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	60 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	1.4 J Dup 30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	17 U Dup 17 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	110 > Dup 110 >	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	8.33 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	39 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	81.1	82 Dup 80.8 Dup 69.1	81.3	81.6	88.3	66	60.7	76.1	81.6	82.6	80.5	77.7	46.8	80	75	75.5	78.1	83.6

Notes:
- ng/kg - nanograms per kilogram
- ug/kg - microgram per kilogram
- mg/kg - milligram per kilogram
- Deg C - Degrees in Celsius
- s.u. - standard unit
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.
- Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB012-N1	SJSB012-N1	SJSB012-N1	SJSB012-N1-Composite	SJSB012-N2	SJSB012-N2	SJSB012-N2	SJSB012-N2	SJSB012-N2	SJSB012-S1-Composite	SJSB012-S1-Composite	SJSB012-W1	SJSB012-W1	SJSB012-W1	SJSB012-W1	SJSB012-W1-Composite	SJSB012-W1-Composite	SJSB012-W2
Sample Identification:		SL0143	SL0144	SL0145	SL0146	SL0136	SL0137	SL0138	SL0139	SL0140	SL0107	SL0108	SL0124	SL0126	SL0127	SL0128	SL0129	SL0130	SL0131
Sample Date:		11/13/2018	11/13/2018	11/13/2018	11/13/2018	11/12/2018	11/12/2018	11/12/2018	11/12/2018	11/12/2018	11/10/2018	11/10/2018	11/11/2018	11/11/2018	11/11/2018	11/11/2018	11/11/2018	11/11/2018	11/12/2018
Sample Type:												Duplicate						Duplicate	
Sample Depth:		(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs
Integral Sample ID:		SJSB012-N1-C3	SJSB012-N1-C4	SJSB012-N1-C5	SJSB012-N1-C6	SJSB012-N2-C1	SJSB012-N2-C2	SJSB012-N2-C3	SJSB012-N2-C4	SJSB012-N2-C5	SJSB012-S1-C6	SJSB012-S1-C6 (Field split	SJSB012-W1-C1	SJSB012-W1-C3	SJSB012-W1-C4	SJSB012-W1-C5	SJSB012-W1-C6	SJSB012-W1-C6 (Field split	SJSB012-W2-C1
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	454	30100	5760	4380	34.7	77.4	109	943	23200	117	123	201	1440	27400	4.91 J	2650 J	3420 J	6.49 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	7360 J	32700 J	4070	14500 J	22700 J	1780	3990 J	26900 J	20000 J	909	945	41500 J	27400	21300	1430	65300 J	87000 J	32700 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	72.2	270	131	109	10.9	68.7	62 J	592 J	364	9.56	9.08	33.1	246	281	2.38 J	128	189 J	0.786 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	332	472	177	286	95.1	114	250	1300	319	59.1	60.4	661	855	383	27.2	639	739	112
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	4.12	23.2	11.4	9.36	1.01 U	1.77 J	4.18 UJ	141 J	80.9 J	0.874 J	0.64 J	3.9	39.3	39.8	0.181 U	14.6 J	30.2 J	3.24 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	5.61	35.2	21.2	15	1.6 J	2.14 U	6.84	1310	618	1.51 J	1.48 J	1.66 J	262	195	0.184 U	85.8	204	0.119 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.8 J	4.42 U	2.99 J	2.15 U	1.24 U	1.14 U	1.69 U	20.9	4.4 J	0.92 J	0.79 J	1.72 U	5.44	5.06	0.47 U	3.03 J	3.74 J	1.39 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.9 J	12.1	7.81	5.13	0.927 U	4.72	5.82 U	340	159	0.509 U	0.581 J	0.757 J	73	52.7	0.271 U	23.6 J	55.5	0.198 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	12.9	26.6	13.5	12.4	2.66 U	5.19	11.8	69.3	23.7	1.93 J	1.65 J	7.88	34.5	26.3	0.901 U	15.6	20.2	2.07 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.35 J	5.69	4.37 J	2.51 J	0.382 U	3.18 U	1.39 J	113	57.8	0.537 U	0.561 U	3.04 U	23.4	19.7	0.138 U	7.59	16.9	0.314 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	7.09	10.4 U	5.6	6.93	2.09 U	2.61 J	5.78	36.5	9.66	1.45 J	1.21 U	3.58	14	11.9	1.33 U	7.21	10	2.53 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	1.91 J	20.2	13.1	8.01	1.13 J	1.08 J	3.09 J	876	417	0.495 J	0.357 U	3.04 U	175	105	4.12 U	52.9	126	3.24 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	2 U	8.69	5.03	3.68	1.01 U	1.09 U	1.71 U	132	67.2	0.368 J	0.435 J	1.17 J	27.3	21.3	0.635 U	9.09	19.6	0.861 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.78 J	10.4	6.9	5.62	1.17 U	2.19 J	7.77	85.3	41.2	0.543 U	0.62 J	0.866 U	27.6	19	0.197 U	9.4	16.8	0.27 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	3.37 J	30.1	18.6	9.32	1.77 J	0.909 U	5.79	738	387	1.06 U	1.13 J	0.429 U	162	104	4.12 U	51.5	123	0.235 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	47.6	1390	678	475	7.96	4.8 U	45.9 U	17500	14400	11.6	11.6	1.01 U	4820	5100	1.38	2330	5090	2.47
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	19.2	513	314	186	3.5	3.41	25 U	13300	10500	3.48	2.86	0.696 U	3780	3840	0.968 U	790	1750	2.28
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	454	30100 J	5760	4380	34.7	77.4	109 J	943 J	23200 J	117	123	201	1440	27400	4.91 J	2650 J	3420 J	0.439 U
Total dioxin/furan	pg/g	8330	65600	11200	20000	22900	2060	4450	64400	70600	1120	1160	42400	39400	58900	1470	72100	98800	32800
Total dioxin/furan (ND*0.5)	pg/g	8330	65600	11200	20000	22900	2070	4500	64400	70600	1120	1160	42400	39400	58900	1470	72100	98800	32800
Total dioxin/furan (ND*1)	pg/g	8330	65600	11200	20000	22900	2070	4540	64400	70600	1120	1160	42400	39400	58900	1470	72100	98800	32800
Total heptachlorodibenzofuran (HpCDF)	ng/kg	215	668	283	268	32.8	160	186	1490	741	26.4	26.7	209	840	620	2.59 J	427	602	0.786 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	739	1260	430	697	248	279	575	3850	815	245	292	1250	1960	940	97.8	1510	1780	276
Total hexachlorodibenzofuran (HxCDF)	ng/kg	81	254	134	109	14.9	50.2	71.5	2330	1100	13.9	15	44.2	635	476	4.12 U	247	475	2.54 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	135	282	123	136	26	45.4	105	963	202	37.4	32.7	50.9	353	264	35.7	174	244	25.9
Total pentachlorodibenzofuran (PeCDF)	ng/kg	34.5	154	108	76.3	8.27	5.91	36.4	2630	1370	2.85 J	4.59	3.6	683	448	2.12 J	232	490	2.82 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	21	46.3	22.7	21.5	0.931 J	1.51 J	9.72	333	114	2.88 J	3 J	3.32	100	38.2	3.52 J	25.1	29.2	2.4 J
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	75.7	1960	1020	682	16.8	9.09	46.3	32000	25500	16.7	16.7	8.22	8850	9110	2.62	3210	7040	9.08
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	29.3	625	371	225	8.44	6.55	21.3	14900	11600	5.71	5.43	7.7	4190	4210	1.3	967	2140	6.76
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	74.7	1960	1020	682	16	5.53	9.67	32000	25500	16.1	16.6	7.05	8850	9110	1.57	3210	7040	8.47
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	76.7	1960	1020	682	17.5	12.7	83	32000	25500	17.3	16.8	9.39	8850	9110	3.67	3210	7040	9.69
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	28.3	624	371	225	7.48	5.24	6.11	14900	11600	5.36	5.38	6.73	4190	4210	0.263	967	2140	5.9
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	30.3	626	371	226	9.41	7.86	36.6	14900	11600	6.05	5.47	8.67	4190	4210	2.33	967	2140	7.61
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	29.5	681	401	245	5.4	4.93	6.41	15700	12300	5.43	5.31	1.97	4410	4450	0.138	1070	2370	3.05
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	30	682	401	245	6.07	5.87	22	15700	12300	5.77	5.41	2.62	4410	4450	1.02	1070	2370	3.41
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	30.5	683	401	245	6.75	6.8	37.6	15700	12300	6.12	5.51	3.27	4410	4450	1.89	1070	2370	3.77
Total tetrachlorodibenzofuran (TCDF)	ng/kg	118	1990	1200	864	19.3	4.27	16	48500	26800	19.4	17.8	0.608 U	9350	7010	3.81	3410	7700	6.47
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	29.7	571	343	207	3.5	3.41	9.11	17900	8820	6.14	6.04	0.608 U	3460	2300	7.17	710	1720	2.28
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	35.2	706	405	255	12.9	7.32	9.54	15700	12200	6.61	6.33	22	4410	4460	0.864	1090	2390	14
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	36.2	707	405	255	13.8	8.43	25.6	15700	12200	6.85	6.42	22.7	4410	4460	1.88	1090	2390	14.5
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	37.2	707	405	255	14.8	9.54	41.6	15700	12200	7.08	6.52	23.3	4410	4460	2.89	1090	2390	15.1
Asbestos																			
Asbestos	%	--	--	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	1300 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	1500 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	52 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	110 >	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	9.62 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	746 J Dup 659	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	2600	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	58.8	52.6	56.3	65.2	82	76.9	66	56.3	54.6	79.2	79.4	77.2	59.2	55.7	57.9	62.3	62.7	76

Notes:
- ng/kg - nanograms per kilogram
- ug/kg - microgram per kilogram
- mg/kg - milligram per kilogram
- Deg C - Degrees in Celsius
- s.u. - standard unit
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.
- Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB012-W2	SJSB012-W2	SJSB012-W2	SJSB012-W2	SJSB019-E1	SJSB019-E1	SJSB019-E1	SJSB019-E1	SJSB019-E1	SJSB019-E1-Composite	SJSB019-E2	SJSB019-E2	SJSB019-E2	SJSB019-E2	SJSB019-E2	SJSB019-N1	SJSB019-N1	SJSB019-N1
Sample Identification:		SL0132	SL0133	SL0134	SL0135	SL0053	SL0054	SL0055	SL0056	SL0057	SL0058	SL0012	SL0013	SL0014	SL0015	SL0016	SL0017	SL0018	SL0019
Sample Date:		11/12/2018	11/12/2018	11/12/2018	11/12/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018
Sample Type:																			
Sample Depth:		(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(9-9) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs
Integral Sample ID:		SJSB012-W2-C2	SJSB012-W2-C3	SJSB012-W2-C4	SJSB012-W2-C5	SJSB019-E1-C1	SJSB019-E1-C2	SJSB019-E1-C3	SJSB019-E1-C4	SJSB019-E1-C5	SJSB019-E1-C6	SJSB019-E2-C1	SJSB019-E2-C2	SJSB019-E2-C3	SJSB019-E2-C4	SJSB019-E2-C5	SJSB019-N1-C1	SJSB019-N1-C2	SJSB019-N1-C3
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	17.7	5960	14.9	3.02 J	61.8	414	44.4	2020 J	45200	1700	79.2	298	933	4.13 U	6.18 U	118	338	142
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	4470	11900	270	427	2720	185000	19200 J	279000 J	40600	7000	2240	53600 J	185000	801	571	4840 J	25500 J	3300
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	4.57	497	1.82 J	5.75	27.7	434	89.9	2440	503	465	25.3	145	451	1.25 U	3.09 U	34.6	216	77.6
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	34.9	735	8.89	8.38	114	2730	854	2680	542	1260	123	792	1980	23	19.7	255	1250	145
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.382 J	121	0.483 J	3.57 U	2.91 U	25.8 U	2.58 U	820	98.4	127	2.14 J	9.63	52.7	2.78 U	3.09 U	1.83 U	13.4	24.4
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.554 J	1190	1.07 J	0.398 U	2.29 J	99.9	11.6	13600	879	1070	4.89	8.39	260	1.24 U	0.424 U	3.1	17.1	241
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.418 U	5.42	0.259 U	0.325 U	1.57 J	14.4	5.84 U	7.03	3.75 U	6.15	1.41 U	3.88 U	10.1 U	2.78 U	3.09 U	2.28 J	7.93	0.941 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.266 U	308 J	0.613 J	0.45 J	1.51 U	43.3 J	17.1 J	2040	223 J	278 J	2.44 J	7.77	111 J	0.607 J	3.09 U	2.04 U	11.5	57.6
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.29 J	27.7	0.533 U	0.493 U	4.64	107	31	73.7	26.6 U	38.5	4.46	28.7	80.6	0.782 U	3.09 U	8.73	47.1	4.77 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.228 J	80.8	0.488 U	0.441 U	2.91 U	11.5	3.68 U	628	66.1	80.1	0.536 U	3.18 U	24	2.78 U	3.09 U	0.78 U	2.03 U	16.6
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.674 J	13.4	0.581 U	0.582 U	2.61 U	39	13.5	19.7	10.8 U	14.6	2.69 J	12.1	32.7	1.53 U	3.09 U	5.04	19.6	2.36 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.369 J	690	0.981 J	0.423 U	0.808 U	31.5	3.1 J	10300	476	616	2.61 J	3.18 U	154	0.773 U	3.09 U	1.04 J	3.07 U	139
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.305 U	86.8	0.68 J	0.665 J	1.04 U	12.1 U	0.994 U	493	59.4	63.6	0.486 U	2.63 J	25.3	2.78 U	3.09 U	1.47 J	5.18	15.7
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.477 J	62	0.445 J	0.292 U	2.58 U	58	21	360	45.3	64.2	2.19 J	9.28	39.5	2.78 U	3.09 U	2.96	20.7	12.1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.689 J	629	0.97 J	0.523 J	2 J	51	16.2	7730 U	436	544	3.91	7.27	135	0.376 U	3.09 U	0.733 U	17.8	115
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	1.89	24200	24.3	6.03	11.4 U	1010	38.4	277000	26900	15600	45.3	18.7	7420	26.4	13.5	10.8	14.2	8080
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	0.798 U	15100	11.9	4.34	4.27 U	361	14	175000	14700	4670	15.8	8.05	4060	13.1	6.2	5.15	3.35 U	4820
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	17.7	5960	14.9	3.02 J	61.8	414	44.4	2020 J	45200	1700	79.2	298	933	4.13 U	1.11 U	118	338	142
Total dioxin/furan	pg/g	4530	61600	337	456	2930	190000	20400	766000	131000	33600	2550	54900	201000	864	610	5290	27500	17200
Total dioxin/furan (ND*0.5)	pg/g	4530	61600	338	458	2950	190000	20400	770000	131000	33600	2560	55000	201000	870	613	5290	27500	17200
Total dioxin/furan (ND*1)	pg/g	4540	61600	339	459	2960	190000	20400	774000	131000	33600	2560	55000	201000	876	616	5290	27500	17200
Total heptachlorodibenzofuran (HpCDF)	ng/kg	13.6	983	3.91	8.88	80.4	1150	170	4520	977	974	73.7	495	1520	2.78 U	3.09 U	106	663	157
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	93.4	1620	28.8	30.2	304	7320	2470	5210	1370	2940	356	1990	4820	62.6	64	800	2990	357
Total hexachlorodibenzofuran (HxCDF)	ng/kg	6.05	1900	2.53 J	1.34 J	42.4	948	242	12300	1520	1820	41.8	215	1060	1.17 J	3.09 U	30	335	368
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	12	438	9.84	9.8	46.9	1060	366	501	263	363	52.1	263	714	39.3	24.4	106	424	84.3
Total pentachlorodibenzofuran (PeCDF)	ng/kg	3.03 J	1910	1.95 J	0.523 J	22.7	450	139	14200	1610	1680	24.5	64.2	440	2.78 U	3.09 U	25.9	168	390
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.88 J	165	1.73 J	1.43 J	2.91 U	55	42.5	645	118	106	1.18 J	7.22	40.7	2.78 U	2.97 J	9.16	46.9	28.3
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	3.93	40300	38.3	11.8	11.8	1480	79.9	459000	42300	21100	67.5	48.6	11700	40.2	20.2	20.4	53	13100
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	1.81	16900	14.7	5.88	5.94	500	35.3	194000	16500	5980	22.4	27	4600	15.1	7.43	10.5	32.3	5340
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	3.36	40300	38.2	11.7	3.02	1480	79.2	455000	42300	21100	67.2	48.4	11700	39.7	19.8	19.9	51.1	13100
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	4.51	40300	38.3	11.9	20.5	1490	80.6	463000	42300	21100	67.8	48.8	11700	40.8	20.7	21	54.9	13100
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	1.14	16900	14.6	5.72	2.73	494	33.3	192000	16500	5980	21.8	25.9	4600	14.6	6.95	10.2	30.5	5340
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	2.47	16900	14.8	6.03	9.15	506	37.3	195000	16500	5980	23	28	4610	15.6	7.91	10.9	34.2	5340
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	0.874	18100	15.4	5.58	1.85	526	35.5	205000	17800	6720	24.1	21.5	4940	15.8	7.55	9.23	25.3	5730
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	1.38	18100	15.5	5.72	5.2	529	36.1	207000	17800	6720	24.3	21.8	4950	16.2	7.87	9.55	27.2	5730
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	1.89	18100	15.6	5.86	8.54	532	36.7	209000	17800	6720	24.5	22	4950	16.7	8.18	9.88	29	5730
Total tetrachlorodibenzofuran (TCDF)	ng/kg	4.07	40000	40.8	8.95	4.71	1420	120	253000	32800	34200	78.8	49.9	8370	41.1	23.1	14.1	93.2	8550
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	0.645 U	13200	15.8	4.34	0.6 U	415	35.9	79800	8170	6860	18.6	8.05	2380	27.7	14	5.15	15.8	2500
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	2.47	18000	15.7	6.08	3.7	603	47.4	205000	17800	6650	25.4	47	5010	16.3	7.92	14.3	46.9	5720
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	3.06	18000	15.8	6.21	7.31	609	48.3	206000	17800	6650	25.8	47.3	5010	16.7	8.31	14.6	48.7	5720
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	3.65	18000	15.9	6.35	10.9	615	49.1	208000	17800	6650	26.1	47.5	5010	17.2	8.7	14.8	50.5	5720
Asbestos																			
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	76.7	55.7	77.6	69.5	82.2	65.5	63.1	49.4	57.7	63.6	87.5	73.1	77.7	83.4	79.3	84.6	71.4	70.8

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Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB019-N1	SJSB019-N1	SJSB019-N1-Composite	SJSB019-N1-Composite	SJSB019-N2	SJSB019-N2	SJSB019-N2	SJSB019-N2	SJSB019-N2	SJSB019-S1	SJSB019-S1	SJSB019-S1	SJSB019-S1	SJSB019-S1	SJSB019-S1-Composite	SJSB019-S2	SJSB019-S2	SJSB019-S2
Sample Identification:		SL0020	SL0021	SL0022	SL0022	SL0023	SL0024	SL0025	SL0026	SL0027	SL0006	SL0007	SL0008	SL0009	SL0010	SL0011	SL0001	SL0002	SL0003
Sample Date:		11/3/2018	11/3/2018	11/3/2018	11/13/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018	11/3/2018
Sample Type:																			
Sample Depth:		(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs
Integral Sample ID:		SJSB019-N1-C4	SJSB019-N1-C5	SJSB019-N1-C6	SJSB019-N1-C6	SJSB019-N2-C1	SJSB019-N2-C2	SJSB019-N2-C3	SJSB019-N2-C4	SJSB019-N2-C5	SJSB019-S1-C1	SJSB019-S1-C2	SJSB019-S1-C3	SJSB019-S1-C4	SJSB019-S1-C5	SJSB019-S1-C6	SJSB019-S2-C1	SJSB019-S2-C2	SJSB019-S2-C3
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	8190	22.5	699	--	38.9	446	3540	32000	92.1	45.9	317	1460	16100	9930	2640	680 J	2.73 U	1.29 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	22200	410	7700	--	2580	29900 J	31700 J	26900	595	1990	8620	29100	12600	8220	4980	111000 J	713	367
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	906	2.65 J	166	--	17.2	342	2370	433	5.71	18.5	246	2510	207	142	410	257 J	1.23 J	0.985 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	1010	13.5	391	--	108	1500	1730	562	17.6	124	672	872	330	254	274	5950	31	11
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	293	0.309 J	42.9	--	2.9 U	20.4 U	902	80.9	1.02 J	1.19 U	16	1060	16.9	12.8	136	38.1 J	0.367 U	0.258 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	2960	3.36	409	--	2.67 J	43.3	24500	664 J	7.6	1.86 J	49	16100	35.2	19.2	1150	95.5	1.54 U	0.766 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	4.54	0.218 U	1.99 J	--	0.97 U	11	7.49	4.99	0.348 U	1.11 J	5.68 J	5.61 U	3.73	2.54 U	2.13 J	10.3	0.731 U	0.483 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	721	0.822 U	105 J	--	1.14 U	26.9 J	2330	164	1.63 U	1.11 J	24.8	2600	11	6.32	284	40	0.816 J	0.246 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	31.7	0.501 U	11.6	--	3.97	70	53.5	28.8	0.846 J	5.49	42.2	35.8	18	13.6	10.5	107	1.51 J	0.66 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	224	0.328 U	29	--	0.436 U	7.77	763	50.5	1.01 J	0.31 U	6.6 U	860	4.91	3.22 J	71.4	17.5 U	0.446 J	0.152 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	10.8	0.634 U	5.55	--	2.57 J	28	17.6	14	1.33 J	3.06	25.3	10.2	8.03	5.94	3.94 U	79.4	2.41 J	0.753 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	1710	2.05 J	222	--	0.915 U	11.8 J	11700	393	5.27	0.919 J	24.8	6660	19.9	10.5	516	28.9	1.55 J	0.317 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	158	0.606 J	24.6	--	0.555 U	6.79 U	343	36.7	0.866 J	0.466 J	7.93	602	5.37 U	4.05	59	13.6	0.67 J	0.464 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	125	0.234 U	21	--	1.53 J	35.4	438	37.5	0.536 J	1.64 J	17.4	476	9.45	6.51	44.2	38.6	0.361 U	2.96 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	1660	1.68 J	196	--	1.12 J	41.8	8790	327	3.46	1.84 J	27.2	4960 U	28.3	17.2	405	61.8	1.17 J	0.374 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	63000	65.1	11100	--	12.5	280	279000	17200	108	31.5	757	260000	1590	828	11100	400	33.8	14.2
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	36200	30.1	3380	--	5.45	126	165000	9990	48.4	8.43	350	157000	484	285	3450	186	17.9 U	7.25
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	8190	22.5	699	--	38.9	446	3540	32000	92.1	45.9	317	1460	16100	9930	2640	680 J	2.73 U	1.29 U
Total dioxin/furan	pg/g	139000	552	24500	--	2770	32900	533000	88900	889	2240	11200	479000	31500	19800	25500	119000	788	402
Total dioxin/furan (ND*0.5)	pg/g	139000	553	24500	--	2780	32900	533000	88900	890	2240	11200	482000	31500	19800	25500	119000	799	404
Total dioxin/furan (ND*1)	pg/g	139000	555	24500	--	2780	32900	533000	88900	891	2240	11200	484000	31500	19800	25500	119000	811	406
Total heptachlorodibenzofuran (HpCDF)	ng/kg	1720	2.96	365	--	48.8	969	4310	888	9.62	51	610	4440	467	354	795	870	1.23 J	0.985 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	2040	60.9	958	--	316	3420	3510	1320	62.7	275	1340	1750	843	684	727	9560	88.1	44.4
Total hexachlorodibenzofuran (HxCDF)	ng/kg	4440	3.74	662	--	27.4	631	14300	1170	10.9	26.1	324	16000	191	140	1730	570	1.26 J	0.766 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	273	36.1	124	--	41.7	553	426	276	42	43.8	312	226	186	145	117	1670	30.2	23.3
Total pentachlorodibenzofuran (PeCDF)	ng/kg	5310	5	586	--	10.9	396	13700	1200	12.4	10.7	143	16100	157	103	1430	400	2.73 J	0.374 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	219	5.19	35.6	--	3	48	439	66.2	4.39	3.9	38.9	671	21.3	25.1	78.1	141	3.61	3.73
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	102000	98.2	14800	--	20.8	476	457000	27700	163	43.7	1160	423000	2120	1140	15200	712	45.4	22.3
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	40800	35.5	4130	--	8.29	191	187000	11200	57.9	13.1	428	174000	595	348	4450	297	12.5	8.68
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	102000	98.1	14800	--	20.3	472	457000	27700	162	43.7	1160	420000	2120	1140	15200	711	36.3	22
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	102000	98.3	14800	--	21.2	479	457000	27700	163	43.8	1160	425000	2120	1140	15200	713	54.4	22.6
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	40800	35.3	4130	--	7.66	187	187000	11200	57.7	13.1	427	173000	592	347	4450	296	3.3	8.29
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	40800	35.6	4130	--	8.91	194	187000	11200	58.1	13.1	428	175000	598	348	4450	298	21.8	9.07
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	43900	38.2	4670	--	8.33	198	201000	12000	62.8	14.2	461	186000	667	384	4970	302	4.9	9.01
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	43900	38.3	4670	--	8.62	199	201000	12000	62.9	14.2	461	187000	669	385	4970	303	14	9.21
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	43900	38.5	4670	--	8.91	201	201000	12000	63	14.2	462	188000	670	385	4970	304	23.1	9.42
Total tetrachlorodibenzofuran (TCDF)	ng/kg	96000	100	12700	--	20.3	657	182000	18100	170	63.3	1400	314000	2020	1190	30800	861	53.7	14.2
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	27800	46.6	2680	--	5.78	182	56200	5360	53.3	8.43	390	100000	538	313	6650	249	4.82	16.2
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	43600	38.4	4650	--	10.1	217	199000	12000	62.8	16.1	471	186000	675	392	4920	392	5.5	9.16
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	43600	38.5	4650	--	10.6	220	199000	12000	62.9	16.1	471	187000	678	392	4920	393	14.6	9.48
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	43600	38.7	4650	--	11	224	199000	12000	63	16.1	472	187000	681	393	4920	394	23.7	9.8
Asbestos																			
Asbestos	%	--	--	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	22 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	22 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	8.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	6.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	17 UJ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	110 >	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	24 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	76.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	8.52 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	100 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	32 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	64.1	82.7	73.9 Dup 76.7 J	--	80.3	73.8	53.4	54.9	76.3	89.1	36.5	46.5	68.7	71.9	66.5	88.1	78.3	78.8

Notes:
ng/kg - nanograms per kilogram
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
Deg C - Degrees in Celsius
s.u. - standard unit
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB019-S2	SJSB019-S2	SJSB019-W1	SJSB019-W1	SJSB019-W1	SJSB019-W1	SJSB019-W1	SJSB019-W1-Composite	SJSB019-W1-Composite	SJSB019-W2	SJSB019-W2	SJSB019-W2	SJSB019-W2	SJSB019-W2	SJSB023-E1	SJSB023-E1	SJSB023-E1	SJSB023-E1
Sample Identification:		SL0004	SL0005	SL0028	SL0029	SL0030	SL0031	SL0032	SL0033	SL0034	SL0035	SL0036	SL0037	SL0038	SL0039	SL0066	SL0067	SL0068	SL0069
Sample Date:		11/3/2018	11/3/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/4/2018	11/6/2018	11/6/2018	11/6/2018	11/6/2018
Sample Type:										Duplicate									
Sample Depth:		(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs
Integral Sample ID:		SJSB019-S2-C4	SJSB019-S2-C5	SJSB019-W1-C1	SJSB019-W1-C2	SJSB019-W1-C3	SJSB019-W1-C4	SJSB019-W1-C5	SJSB019-W1-C6	SJSB019-W1-C6 (Field split	SJSB019-W2-C1	SJSB019-W2-C2	SJSB019-W2-C3	SJSB019-W2-C4	SJSB019-W2-C5	SJSB023-E1-C1	SJSB023-E1-C2	SJSB023-E1-C3	SJSB023-E1-C4
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	41.4	6.9	141	937	13500	1550	3.3 J	1850	1470	355 J	11.9 U	0.93 U	5.68 UJ	5.98 U	72.8	165	2690	3760
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	930	542	28200 J	109000	51000	2320	513	23600	19600	15600 J	1390	314	459 J	683	2230	3930	62.8	3950
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	12	3.85 U	151	713	2040	53.4	0.551 U	451	406	249 J	9.49	0.456 U	0.265 UJ	2.99 U	82.3	292	826	114
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	46.4	20.4	2130	6490	1200	109	19.6	1420	922	893 J	55.7	10.7	16.7 J	22.7	121	188	511	171
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	4.32	0.214 U	6.83	224	745	9.51	3.18 U	150	165	17.4 J	3.3 U	3.11 U	2.84 UJ	2.99 U	28.4 U	125	294	15.1
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	37.7	2.26 U	15.8	2020	8460	72.4	1.29 U	1140	1330	25.1 J	1.53 J	0.122 U	2.84 UJ	2.99 U	274	1270	2760	80.1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.687 J	0.346 U	10.4	11.8	7.53	1.49 J	3.18 U	4.35	2.21 U	25.2 J	0.534 U	3.11 U	0.295 UJ	2.99 U	0.754 U	1.01 U	4.29	1.94 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	8.93	0.444 U	12.5 J	524	1860	19.4	0.433 U	271	314	42.5 J	0.797 U	0.169 U	2.84 UJ	2.99 U	63.5	302	651	21.2
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.29 U	0.955 J	68.5	162	45.2	4.45	3.18 U	39.4	22.5	50 J	2.9 J	0.385 J	0.864 J	0.692 U	4.27	5.69 U	21.7	9.75
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.49	0.204 U	2.32 U	148	558	6.07	3.18 U	72.8	80.7	3.72 UJ	0.191 U	3.11 U	2.84 UJ	2.99 U	21	91.9	204	7.61
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.66 J	1.23 J	25.3	61.7	16	3.18	1.43 U	14.9	9.06	19.4 UJ	1.7 U	0.492 U	0.943 J	1.7 J	3.06 U	3.36	7.37	5.58
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	15.7	1.02 J	4.31	1110 J	5870	44	0.914 J	498 J	495	7.6 J	0.678 U	0.23 J	2.84 UJ	0.419 U	159	650	1400	47.2
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.51 U	0.391 J	4.69 U	129	430	6.81	0.257 U	58.8	46.5	6.55 J	0.574 U	0.344 U	2.84 UJ	0.519 U	14.5	64	203	8.72
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.72 U	0.139 U	17.9	111	310	5.18	3.18 U	46.4	50.1	26.2 J	0.71 U	3.11 U	2.84 UJ	2.99 U	13.4	46 U	122	7.1
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	10.8	0.693 J	18.7	978	3160	39.8	0.609 U	416	346	10.9 UJ	1.25 U	0.137 J	2.84 UJ	0.351 U	121	508	1090	45.2
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	328	29.8	16.8	28000	149000	1550 U	31.2	21000	17500	45.3 J	20.5	3.12	3.79 J	4.07	71.3	134	459	297
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	154	15.4	3.33 U	17100	97800	1050	13.7	6510	5800	18.4 J	10.3	1.98 U	1.38 UJ	0.962 U	26.3	55.3	235	131
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	41.4	6.9	141	937	13500	1550	3.3 J	1850	1470	355 J	11.9 U	0.93 U	0.578 UJ	0.788 U	72.8	165	2690	3760
Total dioxin/furan	pg/g	1600	619	30800	168000	336000	5290	582	57500	48600	17400	1490	329	481	711	3270	7780	11500	8670
Total dioxin/furan (ND*0.5)	pg/g	1600	623	30800	168000	336000	6070	585	57500	48600	17400	1500	331	483	714	3290	7800	11500	8670
Total dioxin/furan (ND*1)	pg/g	1600	626	30800	168000	336000	6840	588	57500	48600	17400	1510	334	485	717	3310	7830	11500	8670
Total heptachlorodibenzofuran (HpCDF)	ng/kg	23.6	1.41 J	360	1730	3760	117	3.18 U	863	778	679	21.9	0.456 J	0.452 J	2.99 U	133	528	1450	226
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	138	72.7	4820	13800	2760	288	61.8	2760	1790	2090	152	38.3	51.4	77.4	300	420	1040	463
Total hexachlorodibenzofuran (HxCDF)	ng/kg	53.9	1.33 J	300	3360	11300	135	3.18 U	1740	1940	512	13.9	3.11 U	2.84 U	2.99 U	431	1830	4090	185
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	40.8	26.1	806	1820	348	72.1	14.4	416	233	362	41.6	10	16.3	24.1	64.7	84.6	182	113
Total pentachlorodibenzofuran (PeCDF)	ng/kg	41.8	1.71 J	174	3450	11200	143	0.914 J	1260	1280	505	3.3 U	0.367 J	2.84 U	2.99 U	454	1790	3730	187
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	4.95	4.61	108	355	515	17.3	3.18 U	107	72.7	28.2	0.662 J	3.11 U	1.3 J	2.56 J	23.1	89.3	254	28.6
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	501	46.8	55	46600	252000	1890	45.7	28200	23900	93.9	32.4	4.55	4.89	5.31	288	1000	2510	501
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	183	18	31.8	19500	109000	1130	15.9	8020	7110	58.2	12.6	1.52	1.22	1.28	152	586	1460	194
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	500	46.6	50.8	46600	252000	1110	45.1	28200	23900	87.3	31.3	3.33	3.96	4.33	287	998	2510	501
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	502	47	59.1	46600	252000	2660	46.3	28200	23900	101	33.5	5.77	5.82	6.29	288	1000	2510	501
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	182	17.8	27.7	19500	109000	1090	15.4	8020	7110	55.2	11.8	0.282	0.27	0.312	151	584	1460	194
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	184	18.3	36	19500	109000	1170	16.4	8020	7110	61.2	13.5	2.76	2.18	2.24	152	589	1460	194
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	198	19.2	26.3	20800	116000	1090	16.9	9030	7950	43.5	12.8	0.43	0.56	0.577	147	554	1370	203
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	199	19.4	29.2	20800	116000	1160	17.3	9030	7950	47.4	13.5	1.57	1.4	1.37	147	557	1370	203
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	199	19.5	32.2	20800	116000	1240	17.7	9030	7950	51.2	14.1	2.71	2.23	2.16	147	559	1370	203
Total tetrachlorodibenzofuran (TCDF)	ng/kg	585	47.8	111	64600	222000	3170	45.2	29800	22700	150	29.4	3.52	3.79	16	7420	37700	89000	3500
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	170	22.1	28.3	18900	70800	918	1.17 U	6200	4910	20.4	16	0.861 U	2.44	5.61	2230	11000	29600	1110
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	197	19.6	53.8	20800	115000	1080	17.2	9000	7920	63	13.9	0.6	0.864	1.01	129	479	1250	203
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	198	19.8	58	20800	115000	1160	17.6	9000	7920	65.8	14.5	1.83	1.74	1.89	130	481	1250	203
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	198	20	62.1	20800	115000	1240	18.1	9000	7920	68.6	15.2	3.05	2.62	2.78	130	484	1250	203
Asbestos																			
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	78.4	76.6	73.8	55.6	51	73.9	78.2	67.1	68.3	79.9	71.7	79.3	83.2	79.7	86.8	75.4	65.7	69.7

Notes:
- ng/kg - nanograms per kilogram
- ug/kg - microgram per kilogram
- mg/kg - milligram per kilogram
- Deg C - Degrees in Celsius
- s.u. - standard unit
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.
- Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB023-E1	SJSB023-E1-Composite	SJSB023-E1-Composite	SJSB023-E2	SJSB023-E2	SJSB023-E2	SJSB023-E2	SJSB023-E2	SJSB023-N1	SJSB023-N1	SJSB023-N1	SJSB023-N1	SJSB023-N1	SJSB023-N1-Composite	SJSB023-N1-Composite	SJSB023-N2	SJSB023-N2	SJSB023-N2
Sample Identification:		SL0070	SL0071	SL0072	SL0233	SL0234	SL0235	SL0236	SL0237	SL0059	SL0060	SL0061	SL0062	SL0063	SL0064	SL0065	SL0206	SL0207	SL0208
Sample Date:		11/6/2018	11/6/2018	11/6/2018	11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/5/2018	11/15/2018	11/15/2018	11/15/2018
Sample Type:				Duplicate												Duplicate			
Sample Depth:		(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs
Integral Sample ID:		SJSB023-E1-C5	SJSB023-E1-C6	SJSB023-E1-C6 (Field split	SJSB023-E2-C1	SJSB023-E2-C2	SJSB023-E2-C3	SJSB023-E2-C4	SJSB023-E2-C5	SJSB023-N1-C1	SJSB023-N1-C2	SJSB023-N1-C3	SJSB023-N1-C4	SJSB023-N1-C5	SJSB023-N1-C6	SJSB023-N1-C6 (Field split	SJSB023-N2-C1	SJSB023-N2-C2	SJSB023-N2-C3
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	2.15 J	1090	1090	39.6	5.33 J	5.07 J	5.55 U	1.57 J	20.8	48.6	820	5190	19.8	1130	1260	71.6	5.19 J	0.716 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	554	2320	3040	1220	1970	744	464	351	9120 J	12600	47600	10700	560	1860	14900	16300 J	1270	541
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.349 J	153	174	14.3	6.16	2.37 J	3.99	0.554 U	7.29	56 J	1260	146	1.48 U	240	234	16.4	5.37	0.235 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	19.3	129	170	63.7	49.1	30.6	16.4	10.4	64.1	102	1390	329	18.2	253	325	268	22.6	16.4
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	3.08 U	45.9	58.6	1.71 U	2.06 J	0.158 J	0.183 J	3.24 U	0.922 U	18.3	426	15.8	0.4 J	73.3	76.9	1.33 J	1.78 J	0.0715 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.526 U	483	576	10.1	21.2	1.35 J	1.5 J	0.517 J	6.39	171	6500	46.5	2.69 J	700	759	3.06	15.5	0.243 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.53 U	1.01 U	1.28 J	0.9 J	0.973 J	0.775 U	0.522 U	0.258 U	0.901 J	0.771 U	4.79	3.78	0.402 U	0.758 U	1.66 J	2.05 J	0.467 J	0.386 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.176 U	119	141	2.88 J	5.32	0.353 U	0.345 J	0.215 U	1.85 J	42.1	949	13.7 J	0.775 J	177	189	1.23 UJ	4	0.149 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.06 U	5.4	5.94	2.9 J	1.59 U	1.45 J	0.887 J	0.558 U	1.87 J	3.48	46.6	16.3	0.906 U	6.65 U	9.49	5.72	0.795 J	0.621 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.08 U	34.5	39.6	0.699 U	2.13 J	0.203 U	0.159 J	3.24 U	0.693 J	13.5	328	5.81	0.34 J	52.9	57.2	0.406 U	1.45 J	0.148 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.44 U	2.15 U	2.8 J	1.82 J	3.92	2.51 U	1.43 J	0.799 U	1.71 J	2.56 J	11.7	8.41	1.59 J	3.11 J	4.11	3.3	1.25 J	1.35 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.569 J	275	353	5.46	13.6	0.747 J	0.396 U	0.519 J	3.52	107	2680	28.8	2.05 J	412	451	1.45 J	7.29	0.246 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.353 U	36.1	45.8	1.53 J	2.29 J	0.685 U	0.576 U	0.346 U	0.965 U	11.7	270	6.8	0.625 U	31.8	39.3	1.09 U	1.29 J	0.373 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.08 U	21	24.9	1.12 J	1.26 J	0.129 U	0.168 U	3.24 U	0.729 U	9.32	211	7.93	0.201 U	34.2	34.7	1.16 J	0.821 J	0.0534 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.533 J	240	305	5.1	10.8	0.603 U	0.426 J	0.297 J	3.14	92.3	1140	33	1.8 J	353	400	1.91 J	6.25	0.151 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	16.6	22300	14400	167	403	13.4	8.39	14.4 U	69.6	5130	110000	1520	53.2	17400	16900	28.9	201	5.71
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	8.87	6060	4790	87.7	209	6.77	4.87	8.81 J	33.4	3290	75800	520	28	5540	5050	15.2	114	3.07
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	2.15 J	1090	1090	39.6	5.33 J	5.07 J	5.55 U	1.57 J	20.8	48.6	820	5190	19.8	1130	1260	71.6	5.19 J	0.716 U
Total dioxin/furan	pg/g	602	33300	25200	1620	2710	806	503	373	9340	21700	249000	18600	689	28300	40700	16700	1660	569
Total dioxin/furan (ND*0.5)	pg/g	605	33300	25200	1630	2710	809	506	382	9340	21700	249000	18600	691	28300	40700	16700	1660	570
Total dioxin/furan (ND*1)	pg/g	607	33300	25200	1630	2710	811	510	391	9340	21700	249000	18600	692	28300	40700	16700	1660	571
Total heptachlorodibenzofuran (HpCDF)	ng/kg	0.349 J	282	324	38.4	11.5	3.42	4.17	3.24 U	16.1	102	2310	320	1.64 J	437	462	56.7	9.32	0.363 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	64.8	297	391	140	155	99.7	73.2	58.2	174	234	2610	755	98.3	526	687	1220	69.9	73.5
Total hexachlorodibenzofuran (HxCDF)	ng/kg	3.08 U	725	866	25.7	33.1	2.07 J	2.74 J	0.517 J	14.4	262	5930	171	4.22	1060	1150	18.1	24.3	0.434 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	24.5	49.4	67.9	29.1	72.9	35.6	34.3	33.3	24.1	44.3	281	170	48.2	62.4	90.8	125	25.2	39.9
Total pentachlorodibenzofuran (PeCDF)	ng/kg	1.1 J	783	1010	16.7	33.1	1.76 J	0.426 J	0.882 J	12.4	309	6640	164	6.66	1180	1330	9.86	18.7	2.88 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	4.15	46	58.8	3.43	11.1	7.17	5.51	6.7	0.76 J	21.1	349	27.9	8.77	48.7	59.1	1.43 J	3.79	11.4
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	26.5	28700	19700	264	630	21.3	14.5	16.7	109	8560	188000	2090	84.2	23500	22500	49.8	326	9.33
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	10.4	7410	5810	103	241	8.49	6.27	9.71	41.6	3640	83100	634	32.6	6740	6270	21.9	131	3.92
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	26.1	28700	19700	264	630	20.5	14.1	9.26	109	8560	188000	2090	83.8	23500	22500	49.1	326	9.04
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	26.8	28700	19700	264	630	22.2	14.8	24.1	110	8560	188000	2090	84.5	23500	22500	50.4	326	9.62
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	10.1	7410	5810	103	241	7.76	5.83	9.08	41.1	3640	83100	634	32.1	6740	6270	21.3	131	3.67
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	10.8	7410	5810	103	241	9.23	6.7	10.3	42.1	3640	83100	634	33	6740	6270	22.5	131	4.16
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	10.8	8510	6500	110	260	8.43	6.35	9.04	43.4	3880	88400	704	34.9	7590	7090	20.6	141	3.85
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	11.1	8510	6500	110	260	8.95	6.54	9.94	43.7	3880	88400	704	35.1	7590	7090	21	141	4.03
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	11.4	8510	6500	110	260	9.47	6.73	10.9	44	3880	88400	704	35.3	7590	7090	21.4	141	4.21
Total tetrachlorodibenzofuran (TCDF)	ng/kg	25.9	19300	24600	300	703	29	14.8	8.7	129	5560	55000	1950	100	18400	23400	52.3	415	9.1
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	18.5	4060	5040	96.8	230	6.77	16.2	23.4	36.8	1800	42300	587	46.4	3510	4540	16.7	123	17.6
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	11.1	8480	6460	111	260	8.97	6.61	9.18	46.2	3880	88300	709	34.8	7530	7030	28	141	4.18
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	11.4	8480	6460	111	260	9.6	6.94	10.2	46.7	3880	88300	709	35.2	7530	7030	28.6	141	4.43
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	11.8	8480	6460	111	260	10.2	7.27	11.2	47.3	3880	88300	709	35.6	7530	7030	29.3	141	4.69
Asbestos																			
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0.25	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	340 J	430 J Dup 430	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	510 J	600 J Dup 600	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3	14 Dup 14	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	17 UJ	17 UJ	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	110 >	110 >	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	26 J	36 J	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	8.15 J	8.29 J	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	32 U	32 U	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	76.2	74.4	75.8	83.2	80.4	75.5	74.1	75.8	79.9	84	67.9	70.4	76.9	75.2 Dup 75.2 Dup 74.9 J	74.5 Dup 74.5 Dup 65.3 J	83.6	81.5	81.2

Notes:
- ng/kg - nanograms per kilogram
- ug/kg - microgram per kilogram
- mg/kg - milligram per kilogram
- Deg C - Degrees in Celsius
- s.u. - standard unit
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.
- Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB023-N2	SJSB023-N2	SJSB023-S1	SJSB023-S1	SJSB023-S1	SJSB023-S1	SJSB023-S1	SJSB023-S1-Composite	SJSB023-S2	SJSB023-S2	SJSB023-S2	SJSB023-S2	SJSB023-S2	SJSB023-W1	SJSB023-W1	SJSB023-W1	SJSB023-W1	SJSB023-W1
Sample Identification:		SL0209	SL0210	SL0222	SL0223	SL0224	SL0225	SL0226	SL0227	SL0228	SL0229	SL0230	SL0231	SL0232	SL0216	SL0217	SL0218	SL0219	SL0220
Sample Date:		11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018
Sample Type:																			
Sample Depth:		(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(5-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs
Integral Sample ID:		SJSB023-N2-C4	SJSB023-N2-C5	SJSB023-S1-C1	SJSB023-S1-C2	SJSB023-S1-C3	SJSB023-S1-C4	SJSB023-S1-C5	SJSB023-S1-C6	SJSB023-S2-C1	SJSB023-S2-C2	SJSB023-S2-C3	SJSB023-S2-C4	SJSB023-S2-C5	SJSB023-W1-C1	SJSB023-W1-C2	SJSB023-W1-C3	SJSB023-W1-C4	SJSB023-W1-C5
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	6.3 U	6.5 U	63.7	362	13400	1290	2270	2010	257	3780	4.9 J	1.71 J	9.47	83	605	22900	30.9	41.2
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	653	472	1870	8980	13500	1480	2390	3520	4250	3610	663	731	464	3280	28900	24700	519	480
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	3.15 U	3.25 U	35.1	641	1070	54.4	73.9	233	412	2410	5.86	1.45 J	1.18 J	146	1010	768	1.52 U	1.68 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	22.7	18.4	84.4	379	379	68.3	125	167	221	175	22.1	22.9	14.8	138	909	461	16.4	16.4
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	3.15 U	3.25 U	10	253	400	4.55	6.51	74.2	152	1300	2.61 J	0.701 J	0.282 U	53.6	365	284	2.95 U	3.17 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.213 J	0.229 U	95.1	2360	5000	12.8	10.7	763	1330	12700	19.9	4.8	3.31	572	6130	2570	1.97 J	1.68 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	3.15 U	3.25 U	1.09 J	1.64 J	4.72	0.705 J	1.12 U	1.53 J	1.21 J	2 J	0.472 U	0.551 U	0.522 J	0.601 U	2.74 U	5.51	2.95 U	0.537 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.22 J	3.25 U	25	598	961	4.85 J	4.19 J	185	308	1650	4.91	1.18 J	0.661 U	138	827	568	0.546 U	0.471 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.18 J	3.25 U	2.8	12.2	19.8	3.75	5.75	7.75	6.54	8.27	0.828 U	0.866 U	0.676 J	3.7	26.5	26	0.649 U	0.855 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.15 U	3.25 U	7.39	172	270	1.43 U	1.85 U	55.5	92	578	1.64 J	0.573 U	0.424 J	42.6	240	165	2.95 U	0.43 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.21 U	1.58 U	3.25	4.77	10.2	1.81 J	3.07 U	3.28 U	3.38	3.24 J	1.63 U	1.79 J	1.05 J	2.75 U	8.33	12.8	1.29 U	1.37 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	3.15 U	3.25 U	52.3	1280	1900	5.16	5.85	461	685	3170	11.2	3.51	2.08 J	313	1890	1160	1.39 J	1.25 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.542 U	0.817 J	6.28	161	122	1.88 J	2.71 J	44.2	53.8	161	1.26 U	0.527 U	0.567 J	26	199	128	0.451 U	0.606 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.15 U	3.25 U	5.49	101	164	3.01 J	3.05 U	37.1	55.6	279	0.929 U	0.288 U	0.223 U	26.1	143	90.3	0.361 U	0.184 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	3.15 U	3.25 U	42.9	1080	1190	7.68	9.04	352	504	1680	8.46	2.37 J	1.61 U	242	1670	982	1.26 J	1.23 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	4.37	6.85	2200	66000	46100	239	336	19500	19600	64900	382	77.8	60.2	11300	100000	79500	43.1	41.1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	2.25	3.01 U	1310	40300	30000	106	136	12100	11300	38900	167	36.4	24.8	6790	59800	54700	20.5	17.1
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	1.1 U	1.28 U	63.7	362	13400	1290	2270	2010	257	3780	4.9 J	1.71 J	9.47	83	605	22900	30.9	41.2
Total dioxin/furan	pg/g	684	498	5810	123000	114000	3280	5380	39500	39200	135000	1290	886	583	23200	203000	189000	635	604
Total dioxin/furan (ND*0.5)	pg/g	686	503	5810	123000	114000	3280	5380	39500	39200	135000	1300	887	584	23200	203000	189000	638	605
Total dioxin/furan (ND*1)	pg/g	689	509	5810	123000	114000	3290	5380	39500	39200	135000	1300	888	586	23200	203000	189000	641	606
Total heptachlorodibenzofuran (HpCDF)	ng/kg	3.15 U	3.25 U	73	1130	1910	117	153	419	688	4720	10.9	2.15 J	1.8 J	257	1860	1520	0.691 J	1.68 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	85.5	62.5	212	740	944	177	399	412	221	175	22.1	22.9	54	294	1830	1110	64.5	58.9
Total hexachlorodibenzofuran (HxCDF)	ng/kg	0.433 J	3.25 U	155	3500	5570	52	63.8	1160	1920	12200	28.1	6.82	3.94	843	5240	3740	1.97 J	2.79 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	37.9	23	79.7	97.3	210	39.2	82.9	73	37.5	40.5	6.07	8.83	26.7	72.4	191	234	34.6	28
Total pentachlorodibenzofuran (PeCDF)	ng/kg	3.15 U	3.25 U	149	3560	4730	44.8	61.7	1260	1800	6720	28.9	6.23	3.86	844	5360	3190	3	3.56
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	3.1 J	0.817 J	15.9	195	169	7.14	11.3	59.8	77	187	8.46	10.1	5.62	44.1	256	184	6.09	3.02 J
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	7.3	9.64	3580	108000	78300	358	488	32200	31700	108000	562	118	87.2	18500	163000	136000	65.6	60.3
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	3.11	3.16	1460	44700	33800	127	164	13400	12800	44900	195	42.8	29.7	7600	66700	59700	24	20.7
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	6.76	7.73	3580	108000	78300	358	487	32200	31700	108000	561	118	86.4	18500	163000	136000	65.3	59.9
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	7.83	11.6	3580	108000	78300	358	488	32200	31700	108000	563	118	88.1	18500	163000	136000	66	60.7
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	2.61	1.23	1460	44700	33800	127	163	13400	12800	44900	194	42.4	29.2	7600	66700	59700	23.6	20.4
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	3.61	5.09	1460	44700	33800	127	164	13400	12800	44900	195	43.3	30.1	7600	66700	59700	24.5	21.1
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	2.85	1.09	1570	47900	36000	138	178	14400	13800	48000	213	46.3	31.8	8150	71600	63600	25.7	22.3
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	3.17	2.95	1570	47900	36000	138	178	14400	13800	48000	213	46.6	32.3	8150	71600	63600	26	22.5
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	3.49	4.8	1570	47900	36000	138	179	14400	13800	48000	214	46.8	32.7	8150	71600	63600	26.3	22.7
Total tetrachlorodibenzofuran (TCDF)	ng/kg	5.7	8.42	3000	85400	64300	429	608	24000	30500	84100	692	133	110	13900	80200	70000	73.8	75.6
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	7.71	5.71	857	25300	19400	108	141	7330	8570	24200	210	61.4	32.7	4030	32200	20300	39.3	24.2
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	3.27	1.83	1570	47800	35800	139	181	14300	13700	47700	211	46.2	32.3	8110	71300	63500	25.8	22.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	3.7	3.64	1570	47800	35800	139	181	14300	13700	47700	212	46.6	32.6	8110	71300	63500	26.2	22.8
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	4.12	5.45	1570	47800	35800	139	182	14300	13700	47700	213	47	32.9	8110	71300	63500	26.6	23.1
Asbestos																			
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	78.9	75.8	86.2	69.8	64	79.8	76.3	74.7	80.1	69.4	73.5	73.6	78.2	82.2	66.6	58.3	79.4	77.2

Notes:
ng/kg - nanograms per kilogram
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
Deg C - Degrees in Celsius
s.u. - standard unit
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB023-W1-Composite	SJSB023-W2	SJSB023-W2	SJSB023-W2	SJSB023-W2	SJSB023-W2	SJSB025-E2-Composite	SJSB025-N1	SJSB025-N1
Sample Identification:		SL0221	SL0211	SL0212	SL0213	SL0214	SL0215	Comp-SL0119-0123	SL0079	SL0080
Sample Date:		11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/11/2018	11/8/2018	11/8/2018
Sample Type:										
Sample Depth:		(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs
Integral Sample ID:		SJSB023-W1-C6	SJSB023-W2-C1	SJSB023-W2-C2	SJSB023-W2-C3	SJSB023-W2-C4	SJSB023-W2-C5	SJSB025-E2	SJSB025-N1-C1	SJSB025-N1-C2
Dioxins/Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	2090	89.3	162	15.5	2.52 U	0.989 J	5.07 J	18.6	262
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	4410	3270	7220	1390	452	528	396	4310	6250
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	206	136	262	25.7	0.942 J	0.363 J	2.04 J	8.94	444
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	189	152	271	37.7	15	15.2	15.7	34.3	307
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	66.3	49.4	96	9.3	0.291 U	0.453 J	0.319 J	1.53 J	144
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	634	510	1030	84	1.98 J	0.427 U	1.98 J	16	1160
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.82 U	0.874 J	1.04 J	3.11 U	0.403 J	0.342 U	0.336 J	0.536 J	1.18 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	149	118	258	21.4	0.563 J	0.38 U	0.47 U	4.4	273
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	6.96 U	4.17	7.49	0.928 J	0.713 J	0.921 J	0.62 U	1.05 U	9.19
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	47.2	36	75.4	6.17	0.252 U	0.446 U	0.16 U	1.67 J	130
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	3.32	2.95	2.72 U	1.64 J	1.28 J	1.44 U	0.67 J	1.07 J	4
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	374	281	589	44.6	1.26 J	0.35 U	0.857 U	9.07	551
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	41.4	25.6	50.8	5.07	0.316 U	0.564 U	0.276 U	1.38 J	49
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	30.2	21.4	45.3	4.03	0.104 U	0.329 J	0.151 U	1.06 J	59.3
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	334	228	485	38.5	0.974 J	0.358 U	0.811 U	8.04	464
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	20700	10900	20800	1540	29.7	2.42	23.9	308	23600
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	11600	7330	14500	1020	14	1.36	10.7	159	13400
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	2090	89.3	162	15.5	2.52 U	0.989 J	5.07 J	18.6	262
Total dioxin/furan	pg/g	40900	23200	45900	4240	519	550	457	4880	47100
Total dioxin/furan (ND*0.5)	pg/g	40900	23200	45900	4240	521	552	458	4880	47100
Total dioxin/furan (ND*1)	pg/g	40900	23200	45900	4240	522	554	460	4880	47100
Total heptachlorodibenzofuran (HpCDF)	ng/kg	391	249	481	45.7	0.942 J	0.453 J	4.72	19.8	816
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	435	331	522	108	15	91	59.3	83.2	578
Total hexachlorodibenzofuran (HxCDF)	ng/kg	955	745	1530	125	2.65 J	0.329 J	2.59 J	28	1840
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	76.9	65.2	68.4	55	7.86	45.9	17.4	10.9	91.4
Total pentachlorodibenzofuran (PeCDF)	ng/kg	1060	780	1640	127	1.26 J	2.94 U	0.963 J	26.2	1660
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	61.2	41.1	71.8	14.3	6.5	7.24	2.25 J	1.83 J	76.1
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	32800	18600	36000	2620	45.5	4.52	35.6	480	37700
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	13000	8100	16000	1140	16.8	2.13	12.8	183	15100
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	32800	18600	36000	2620	45.3	3.9	35	480	37700
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	32800	18600	36000	2620	45.6	5.14	36.2	480	37700
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	13000	8100	16000	1140	16.6	1.6	12.3	183	15100
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	13000	8100	16000	1140	16.9	2.67	13.2	183	15100
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	14000	8630	17000	1210	18	1.73	13.4	197	16200
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	14000	8630	17000	1210	18.1	2.12	13.8	197	16200
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	14000	8630	17000	1210	18.2	2.51	14.1	198	16200
Total tetrachlorodibenzofuran (TCDF)	ng/kg	24300	14700	30400	2650	56.3	2.42	42.8	566	27600
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	6670	4360	8600	755	26.6	14	14.7	175	8070
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	13900	8600	16900	1200	18.1	2.05	13.7	198	16100
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	13900	8600	16900	1200	18.3	2.54	14	198	16100
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	13900	8600	16900	1200	18.4	3.03	14.4	198	16100
Asbestos										
Asbestos	%	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)										
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)										
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--
General Chemistry										
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--
Total solids	%	72	85.9	83.4	77.2	77.2	77.8	78	79.9	79.8

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB025-N1	SJSB025-N1	SJSB025-N1	SJSB025-N1-Composite	SJSB025-N2	SJSB025-N2	SJSB025-N2	SJSB025-N2	SJSB025-N2
Sample Identification:		SL0081	SL0082	SL0083	SL0084	SL0085	SL0086	SL0087	SL0088	SL0089
Sample Date:		11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018	11/8/2018
Sample Type:										
Sample Depth:		(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs
Integral Sample ID:		SJSB025-N1-C3	SJSB025-N1-C4	SJSB025-N1-C5	SJSB025-N1-C6	SJSB025-N2-C1	SJSB025-N2-C2	SJSB025-N2-C3	SJSB025-N2-C4	SJSB025-N2-C5
Dioxins/Furans										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	95.1	22.9	1.61 J	91.9	13.4	66.3	86.3	15.2	1.84 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	1800	1040	499	2540	4850 J	1740	3320	785	228
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	168	38.9	2.18 J	156	8.09	100	158	22.3	3.26
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	95.7	49.5	18.6	144	37.4	96.2	203	36.9	8.03
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	74.3	13.2	0.479 U	57.3	2.99 U	38.2	56.2	8.29	0.583 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	911	118	7.75	705	4.37	376	519	75.5	2.75 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.25 U	0.266 J	0.21 U	0.506 U	0.48 U	0.331 U	0.523 U	0.293 U	0.519 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	186	28.5	1.61 U	156	1.83 J	81.7	122	19.3	0.839 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	3.01 J	1.47 J	0.474 U	3.79	1.47 J	3 J	5.61	1.12 U	0.659 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	72.2	8.39	0.814 J	43.6	0.525 U	24.3	35	5.56	0.306 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.05 J	1.55 J	1.27 J	2.39 J	1.44 J	1.22 J	1.92 U	1.11 J	0.804 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	516	63.8	4.81	319	2.07 J	147	292	43	2.16 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	15.9	7.49	0.839 J	21.8	0.783 J	12.3	31.2	4.88	0.547 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	35.8	5.27	0.424 U	25.4	1.49 J	13.3	22.9	3.64	0.453 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	313	56.9	4.1	215	2.28 U	114	275	36.7	1.88 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	10400	2930	140	7980	37.2	5350	14300	1830	54.1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	5640	1630	66.9	2920	17.8	3130	8450	1110	26.5
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	95.1	22.9	1.61 J	91.9	13.4	66.3	86.3	15.2	1.84 U
Total dioxin/furan	pg/g	20300	6020	748	15400	4980	11300	27900	4000	325
Total dioxin/furan (ND*0.5)	pg/g	20300	6020	749	15400	4980	11300	27900	4000	329
Total dioxin/furan (ND*1)	pg/g	20300	6020	751	15400	4980	11300	27900	4000	333
Total heptachlorodibenzofuran (HpCDF)	ng/kg	304	69.7	3.37	283	15.5	183	287	41.4	5.5
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	187	109	55	305	95	173	354	88.5	30
Total hexachlorodibenzofuran (HxCDF)	ng/kg	1290	175	8.57	1000	15.1	533	757	114	0.682 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	17.1	26.3	25.4	53.2	17.1	20.5	30.2	25.7	17.5
Total pentachlorodibenzofuran (PeCDF)	ng/kg	1270	184	11.9	798	8.7	396	876	122	4.04
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	20.7	10.3	5.54	31.3	2.28 J	17.7	41.6	6.31	3.95
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	16500	4650	214	11300	58.7	8670	23200	3000	83.3
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	6480	1830	78.1	3560	22.7	3530	9420	1240	31.1
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	16500	4650	213	11300	57.5	8670	23200	3000	82.8
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	16500	4650	214	11300	59.9	8670	23200	3000	83.9
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	6480	1830	78	3560	21.9	3530	9420	1240	30.6
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	6480	1830	78.3	3560	23.4	3530	9420	1240	31.6
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	6990	1970	84.6	3950	23.1	3790	10100	1330	33.1
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	6990	1970	84.7	3950	23.7	3790	10100	1330	33.5
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	6990	1970	84.9	3950	24.3	3790	10100	1330	33.9
Total tetrachlorodibenzofuran (TCDF)	ng/kg	11200	3930	245	11900	67.3	7000	18700	2590	90.9
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	2930	1130	82.1	2400	19.5	2030	5360	778	33.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	6930	1970	84.5	3910	25.3	3770	10100	1320	32.8
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	6930	1970	84.6	3910	25.7	3770	10100	1320	33.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	6930	1970	84.7	3910	26.1	3770	10100	1320	33.9
Asbestos										
Asbestos	%	--	--	--	0	--	--	--	--	--
Polychlorinated biphenyls (PCBs)										
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)										
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	33 J	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	130 J	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	1.7 J	--	--	--	--	--
General Chemistry										
Cyanide (total)	mg/kg	--	--	--	17 UJ	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	110 >	--	--	--	--	--
Moisture	%	--	--	--	22 J Dup 21.5	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	8.13 J	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	32 U Dup 32 U	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--
Total solids	%	76.7	79.7	78.6	3 Dup 77.5 Dup 76.4 Dup 7	81.2	78.4	74.7	76	77.1

Notes:
- ng/kg - nanograms per kilogram
- ug/kg - microgram per kilogram
- mg/kg - milligram per kilogram
- Deg C - Degrees in Celsius
- s.u. - standard unit
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.
- Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB025-S1	SJSB025-S1	SJSB025-S1	SJSB025-S1	SJSB025-S1	SJSB025-S1-Composite	SJSB025-S1-Composite	SJSB025-S2	SJSB025-S2	SJSB025-S2	SJSB025-W1-Composite	SJSB039	SJSB039	SJSB039	SJSB039	SJSB039	SJSB039-Composite	SJSB040
Sample Identification:		SL0244	SL0245	SL0246	SL0247	SL0248	SL0249	SL0250	SL0116	SL0117	SL0118	SL0256	SL0186	SL0187	SL0188	SL0189	SL0190	SL0191	SL0192
Sample Date:		11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/16/2018	11/11/2018	11/11/2018	11/11/2018	11/16/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018
Sample Type:								Duplicate											
Sample Depth:		(0-2) ft bgs	(2-4) ft bgs	(5-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs
Integral Sample ID:		SJSB025-S1-C1	SJSB025-S1-C2	SJSB025-S1-C3	SJSB025-S1-C4	SJSB025-S1-C5	SJSB025-S1-C6	SJSB025-S1-C7 (Field split	SJSB025-S2-C3	SJSB025-S2-C4	SJSB025-S2-C5	SJSB025-W1-C6	SJSB039-C1	SJSB039-C2	SJSB039-C3	SJSB039-C4	SJSB039-C5	SJSB039-C6	SJSB040-C1
Dioxins/Furans																			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	23.8	236	2.15 J	5.12 J	0.202 U	19.4	26.8	5.33 J	7.33	0.444 J	8.77	45.9	67.5	235	1950	0.985 U	710	47.6
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	26100 J	4590	849	2270	385	4420	7340	788	236	280	502	984	1530	4400	8090	441	4580	988
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	9.2	279	2.82 J	8.18 J	0.36 J	27.5	32.9	2.75 J	21.3	0.27 J	11.3	12.3	13.1	72.6	243	0.398 U	94	12.3
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	77.7	258	29.6	77	13.6	43.2	61.4	28.1	8.33	9.01	10.3	54.4	66.9	211	267	13.5	159	51.9
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	1.82 J	108	0.534 U	2.33 U	0.0462 U	10	11.3	0.751 U	0.405 U	0.151 J	3.63	0.941 U	0.994 J	14.2	74	3.14 U	26.5	1.16 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	12.9	1070	6.74	22.5	0.194 U	92.6	111	5.55	0.923 J	0.141 U	27.6	3.01 J	2.84 J	98.1	650	0.845 J	206	5.05
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.627 J	1.15 J	0.725 J	1.93 U	0.342 U	0.539 J	0.764 U	0.439 U	3.08 U	3.01 U	2.85 U	0.589 J	0.86 J	1.75 U	1.91 J	3.14 U	1.36 J	0.538 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	3.62	251 J	2.01 J	6.38 J	0.162 U	21.1	23.9	1.56 J	0.276 U	0.107 U	8.08	1.19 J	1.09 U	23.4	143	0.328 U	49.7	1.23 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.3 U	8.03	1.28 J	3.06 J	0.604 U	1.25 J	1.93 U	1.2 U	1.14 J	0.355 U	0.287 U	2.63 J	2.53 J	7.69	9.55	3.14 U	6.93	2.35 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.03 J	78.7	0.937 J	2.36 J	0.0893 U	7.41	8.1	0.598 U	0.293 J	0.117 U	3.11	0.643 J	0.445 U	7.58	45.6	3.14 U	17.3	0.502 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.1 U	3.49	2.23 J	5.46 J	0.94 J	1.04 U	1.41 J	1.32 U	0.951 J	0.775 U	0.277 U	1.55 J	1.92 J	4.37	4.56 U	0.755 U	3.56	1.37 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	7.33	509	4.33	14.7 J	0.149 U	47.1	56.3	3.91	3.08 U	3.01 U	10.7	1.59 J	1.59 J	47.5	333	0.701 J	118	1.91 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.02 J	45.7	0.926 U	3.14 U	0.319 U	5.39	6.48	1.12 U	0.136 U	0.235 U	1.01 U	0.717 J	0.794 U	5.1	29.1	0.279 J	12	0.605 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.06 J	49.1	0.647 J	1.66 J	0.134 U	4.7	5	0.372 U	0.562 J	0.102 U	1.92 J	0.944 U	0.96 J	6.78	30.2	0.0934 J	11.6	0.703 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	6.89	390	3.95	13.6 J	0.246 U	41.1	47.9	3.41 U	3.08 U	3.01 U	8.75	1.63 J	1.63 J	34.3	298	0.418 U	94.5	2.19 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	229	18000	142	513	2.24	1910	2550	143	0.616 U	0.602 U	298	28.1	33.7	1200	10200	15.7 J	6280	38.5
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	108	11400	66.3	253	0.896 U	1240	1650	78	0.836 U	0.74 U	148	11	14.8	710	5940	7.95 J	3750	16.6
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	23.8	236	2.15 J	5.12 J	0.202 U	19.4	26.8	5.33 J	7.33	0.444 J	8.77	45.9	67.5	235	1950	0.985 U	710	47.6
Total dioxin/furan	pg/g	26600	37300	1110	3200	402	7890	11900	1060	277	290	1040	1150	1740	7080	28300	480	16100	1170
Total dioxin/furan (ND*0.5)	pg/g	26600	37300	1120	3200	404	7890	11900	1060	278	292	1040	1150	1740	7080	28300	482	16100	1170
Total dioxin/furan (ND*1)	pg/g	26600	37300	1120	3200	406	7890	11900	1070	280	293	1050	1150	1740	7080	28300	484	16100	1170
Total heptachlorodibenzofuran (HpCDF)	ng/kg	21.1	506	3.99	8.18 J	0.488 J	49.7	63.1	2.82 J	34	0.421 J	20	32.7	39.5	208	474	3.14 U	201	38.2
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	195	485	87.5	312	44.2	105	144	111	32.7	45.1	28	138	220	609	743	60.9	392	135
Total hexachlorodibenzofuran (HxCDF)	ng/kg	24.9	1570	11.9	36.9	0.128 J	138	160	6.56	9.51	3.01 U	41.8	17.2	14.9	185	978	0.938 J	336	14.8
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	12.2	87	28.8	188	16.9	37.3	28	34.6	17.8	28.7	7.11	28	31	75.5	92.2	46.9	76.4	22.7
Total pentachlorodibenzofuran (PeCDF)	ng/kg	25.9	1370	13.8	36.2	1.17 J	137	160	7.88	3.08 U	0.441 J	24.5	9.83	6.74	115	1010	0.701 J	343	5.77
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.36 J	63.9	1.7 J	34.2	2.42 J	8.98	13.8	3.57	1.81 J	3.01 U	1.39 J	1.12 J	4.09	11	42	7.43	21	1.21 J
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	350	30000	215	787	3.17	3210	4280	225	1.37	0.85	461	42.6	51.8	1970	16600	24.4	10200	58.8
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	129	12700	77.6	292	0.968	1380	1830	87.8	1.06	0.642	173	15.2	19.1	810	6740	9.43	4160	21.1
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	350	30000	214	785	2.39	3210	4280	222	0.53	0.0413	460	42.6	51.3	1970	16600	24.2	10200	58.2
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	350	30000	215	789	3.95	3210	4280	227	2.21	1.66	461	42.7	52.2	1970	16600	24.7	10200	59.3
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	129	12700	77.2	290	0.177	1380	1830	86.2	0.444	0.0413	172	15.1	18.6	810	6740	9.2	4160	20.5
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	129	12700	78.1	294	1.76	1380	1830	89.4	1.68	1.24	175	15.2	19.5	811	6740	9.66	4160	21.7
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	137	13600	84.1	316	0.318	1470	1950	93.2	0.387	0	187	16	20	867	7230	9.79	4470	22.4
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	137	13600	84.4	317	0.987	1470	1950	94.5	0.936	1.15	187	16.1	20.3	867	7230	9.99	4470	22.8
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	137	13600	84.6	318	1.66	1470	1950	95.9	1.48	1.15	188	16.1	20.5	867	7230	10.2	4470	23.1
Total tetrachlorodibenzofuran (TCDF)	ng/kg	405	24200	250	904	5.59	2580	3290	258	0.616 U	1.64	516	47.4	51.2	1810	16100	21.5	5160	59.6
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	120	7290	78.2	373	5.82	813	1040	86.6	0.836 U	16	161	11.5	18.3	572	4720	19.8	1730	20.2
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	145	13500	83.9	314	0.573	1470	1950	93.7	0.756	0.178	185	17	20.9	866	7190	10.2	4460	22.9
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	145	13500	84.3	316	1.3	1470	1950	94.9	1.32	0.795	186	17.1	21.4	866	7190	10.3	4460	23.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	145	13500	84.8	318	2.02	1470	1950	96.2	1.89	1.41	187	17.1	21.9	866	7190	10.5	4460	23.9
Asbestos																			
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																			
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																			
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																			
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	84	80.4	76	12.8	76.5	77.6	77.6	80.2	79	76.3	80.7	81.5	82.2	81.2	66.1	79.7	78	79.5

Notes:
ng/kg - nanograms per kilogram
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
Deg C - Degrees in Celsius
s.u. - standard unit
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
Dup - indicates the result from a duplicate sample

Table 2

First Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Area:	Units	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits	Southern Impoundment - Waste Pits
Sample Location:		SJSB040	SJSB040	SJSB040	SJSB040	SJSB040-Composite	SJSB041	SJSB041	SJSB041	SJSB041	SJSB041	SJSB041-Composite	SJSB041-Composite	SJSB042-Composite	SJSB042-Composite	SJSB043-Composite	SJSB044-Composite
Sample Identification:		SL0193	SL0194	SL0195	SL0196	SL0197	SL0198	SL0199	SL0200	SL0201	SL0202	SL0203	SL0204	SL0045	SL0046	SL0052	SL0243
Sample Date:		11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/14/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/4/2018	11/4/2018	11/4/2018	11/16/2018
Sample Type:													Duplicate		Duplicate		
Sample Depth:		(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-10) ft bgs	(0-9) ft bgs
Integral Sample ID:		SJSB040-C2	SJSB040-C3	SJSB040-C4	SJSB040-C5	SJSB040-C6	SJSB041-C1	SJSB041-C2	SJSB041-C3	SJSB041-C4	SJSB041-C5	SJSB041-C6	SJSB041-C6 (Field split)	SJSB042-C6	SJSB042-C6 (Field split)	SJSB043-C6	SJSB044-C6
Dioxins/Furans																	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	83.6	202	245	3330	715	158	193	298	6.02 U	3.93 J	142	78.6	45	51.8	1.51 J	12.6
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	1670	3370	3390	3680	1810	3700	4050	1830	393	299	1920	1000	4600 J	4870 J	212	473
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	22.1	54.4	65.1	105	37.4 J	46.3	298	101	2.1 J	2.48 J	78.4	41.8	16.7	19.6	1.06 J	3.67
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	85.5	181	214	174	98.1	185	227	82.6	12.8	10.1	90.7	47.3	135	146	7.06	18.1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	1.65 U	3.09 J	1.93 U	16.9	4.65	4.19	106	38.8	0.6 J	0.775 J	25.3	14.8	1.09 U	1.51 J	0.177 J	0.434 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	6.28	9.12	7.33	104	23.2	7.35	1040	425	6.71	8.66	232	137	2.69 J	3.26	1.63 J	2.83 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.974 J	1.43 U	1.11 U	1.97 J	0.841 U	2.29 J	1.1 J	0.677 J	0.319 U	2.92 U	0.731 U	0.362 J	0.84 J	0.968 J	2.94 U	0.264 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.77 J	2.74 J	2.89 J	26.5	6.41	3.53	242	108	1.58 J	2.21 J	57.3	33.8	1.47 J	1.5 U	0.515 J	0.804 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.83 U	7.11	10.5	9.75	4.76	7.53	8.04	3.27 J	0.558 U	0.391 U	4.04	2.38 J	3.89	4.41	2.94 U	0.974 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.68 J	0.905 U	0.492 U	9.45	2.18 U	1.58 J	76.1	31.9	0.618 U	0.727 J	18.4	11.7	0.314 U	0.567 J	0.145 U	0.219 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.33 J	4.16	4.77	4.19	3.15 J	3.24 U	3.09 J	1.94 U	1.06 J	0.422 U	1.75 U	0.961 U	2 J	2.3 J	0.411 U	0.669 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	3.56	4.57	4.96	60.9	13.1	2.64 J	576	247	3.72	4.9	148	86	1.14 J	1.21 U	1.08 J	1.46 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.931 U	1.54 J	1.94 U	7.76 U	2.6 U	0.737 U	52.4	16	0.744 U	0.765 J	14.6	7.99 U	0.384 U	0.69 U	2.94 U	0.374 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.26 J	1.98 J	2.22 J	8.04	2.2 U	3.78	41.9	18.7	0.391 J	0.467 U	13.1	8.03	0.954 J	1.24 U	0.0866 U	0.776 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	3.01 J	4.16	4.87	54.5	11.3	3.42 U	465	168	3.04	4.05	117	68.9	1.65 J	1.85 J	0.651 U	0.897 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	52.2	89.7	115	2170	391	23.2	23500	5490	108	155	7270	5040	22.3	26.7	29.7	37.1
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	23.5	41.5	55.4	1640	199 J	11.3	16800	3640	47.6	67.4	4110	2790	7.34	8.69	9.9	18.8
Octachlorodibenzofuran (OCDF) 13C12	ng/kg	83.6	202	245	3330	715	158	193	298	0.554 U	3.93 J	142	78.6	45	51.8	1.51 J	12.6
Total dioxin/furan	pg/g	1960	3980	4120	11400	3320	4160	47700	12500	581	560	14200	9360	4840	5140	265	570
Total dioxin/furan (ND*0.5)	pg/g	1960	3980	4120	11400	3320	4160	47700	12500	582	561	14200	9370	4840	5140	266	571
Total dioxin/furan (ND*1)	pg/g	1960	3980	4130	11400	3320	4160	47700	12500	583	562	14200	9370	4840	5140	267	573
Total heptachlorodibenzofuran (HpCDF)	ng/kg	67.8	185	232	243	105	132	535	188	2.7 J	4.49	149	81.2	59.2	67.9	1.24 J	9.37
Total heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	230	439	430	440	237	465	464	205	61.5	59.1	217	115	363	402	28.7	49.6
Total hexachlorodibenzofuran (HxCDF)	ng/kg	26.9	57.4	54.3	221	57.9	43.4	1540	635	9.23	12.3	358	215	23.5	24.8	2.63 J	6.84
Total hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	36.3	75.6	75.6	102	23.9	68.8	55.9	45.2	35.3	57	47.9	29.1	56.9	62.5	12.1	14.5
Total pentachlorodibenzofuran (PeCDF)	ng/kg	15.7	24.8	16	213	45.2	25.2	1570	638	6.76	13.4	418	236	11	10.5	1.51 J	16.3
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	3.37	10.6	7.12	13.4	0.916 J	10.2	70.4	26.1	6.32	14.3	23.9	3.27	0.703 J	4.21	1.49 J	0.573 J
Total TEQ 1998 (Avian) (ND*0.5)	ng/kg	81.3	140	180	3890	608	39.9	41000	9400	160	229	11600	7930	33.2	39.3	40.4	57.4
Total TEQ 1998 (Fish) (ND*0.5)	ng/kg	30.3	52.8	67.7	1800	230	17.8	18400	4090	56.1	79.5	4590	3100	11.3	13.2	12	22
Total TEQ Dioxin 1998 (Bird) (ND=0)	ng/kg	80.8	140	179	3890	607	37.7	41000	9400	160	229	11600	7930	33	38.8	40	56.9
Total TEQ Dioxin 1998 (Bird) (ND=1)	ng/kg	81.8	141	181	3900	610	42.1	41000	9400	161	229	11600	7940	33.4	39.9	40.9	58
Total TEQ Dioxin 1998 (Fish) (ND=0)	ng/kg	29.8	52.4	66.5	1800	229	16.5	18400	4090	55.7	79.4	4590	3100	11.1	12.7	11.7	21.7
Total TEQ Dioxin 1998 (Fish) (ND=1)	ng/kg	30.8	53.2	69	1800	232	19	18400	4090	56.6	79.6	4590	3110	11.5	13.8	12.4	22.3
Total TEQ Dioxin Texas TEF (ND=0)	ng/kg	31.7	56.1	72.4	1900	248	16.4	19600	4350	61.1	86.7	4940	3350	11.6	13.4	13.1	23.3
Total TEQ Dioxin Texas TEF (ND=0.5)	ng/kg	32.1	56.2	72.9	1910	249	17.6	19600	4350	61.3	86.8	4940	3350	11.7	13.8	13.4	23.6
Total TEQ Dioxin Texas TEF (ND=1)	ng/kg	32.5	56.3	73.5	1910	250	18.8	19600	4350	61.6	86.9	4940	3360	11.9	14.1	13.7	23.9
Total tetrachlorodibenzofuran (TCDF)	ng/kg	83.2	142	189	3460	690	40.5	31700	9090	189	269	7120	4350	38.4	40.7	42	77
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	23.5	54.2	55.4	1090	218	11.3	8760	2480	65.9	99.8	1970	1210	7.34	12.6	9.9	23.3
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	32.7	59.4	75.2	1900	248	19.8	19500	4320	60.7	86.4	4930	3340	14.2	16.2	13.3	23.8
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	33.3	59.5	76.2	1900	249	20.9	19500	4320	61.1	86.5	4930	3340	14.4	16.7	13.5	24
Total WHO Dioxin TEQ(Human/Mammal)(ND=1)	ng/kg	33.9	59.6	77.3	1900	251	21.9	19500	4320	61.6	86.6	4930	3350	14.6	17.2	13.8	24.2
Asbestos																	
Asbestos	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)																	
Aroclor (unspecified)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1016 (PCB-1016)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1262 (PCB-1262)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor-1268 (PCB-1268)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (7)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs (ND*0.5)	ug/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (TPH)																	
Total Petroleum Hydrocarbons	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C12-C28)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C25-C36) ORO	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C28-C35)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
General Chemistry																	
Cyanide (total)	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flash point (closed cup)	Deg C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Percent solids	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH, lab	s.u.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Reactive cyanide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfide	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfur	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total solids	%	78.4	73.9	51.1	69.1	72.5	82.6	71.2	74.6	76.7	78.4	77.1	77.3	80	78.7	80.2	79.4

Notes:
ng/kg - nanograms per kilogram
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
Deg C - Degrees in Celsius
s.u. - standard unit
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
Dup - indicates the result from a duplicate sample

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:		SJSB059	SJSB059	SJSB059	SJSB059	SJSB059	SJSB060	SJSB060
Sample Identification:	Units	11187072-101219-BN-SJSB059-S (0-2)	11187072-101219-BN-SJSB059-S (2-4)	11187072-101219-BN-SJSB059-S (4-6)	11187072-101219-BN-SJSB059-S (6-8)	11187072-101219-BN-SJSB059-S (8-10)	11187072-100819-BN-SJSB060-S (0-2)	11187072-100819-BN-SJSB060-S (2-4)
Sample Date:		10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/8/2019	10/8/2019
Sample Depth:		(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs
Sample Type:								
Dioxins/Furans								
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	25	2.8 U	38	630	91	86	36
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	13000 J	340	700	4300	2600	1600	1300
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	6.5	0.91 J	8.0 J	99	6.9 J	30	15
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	130	8.6	54	310	79	160	100
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.61 J	0.057 U	0.23 U	29 J	1.3 J	3.1 J	1.0 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.2 J	0.29 J	1.1 J	450	6.0 J	9.6	2.3 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.2 J	0.27 J	0.18 U	2.6 J	1.1 J	1.8 J	1.6 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.71 J	0.052 U	0.60 J	110	1.6 J	3.1 J	1.2 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.5 J	0.42 J	3.8 J	13 J	2.1 J	6.0 J	4.7 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.14 U	0.062 U	0.15 U	13 J	0.10 U	0.43 U	0.16 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	3.4 J	0.69 J	3.7 J	6.4 J	3.9 J	5.4 J	4.3 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.32 J	0.21 J	0.13 U	360	2.8 J	4.0 J	0.74 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.61 J	0.38 J	0.81 J	7.8 J	1.4 J	1.5 J	1.1 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.41 J	0.051 U	0.13 U	16 J	0.34 J	1.2 J	0.67 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.42 J	0.12 J	0.28 J	150	2.0 J	2.5 J	0.83 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	5.8	1.6	0.96 J	1400	78	66	13
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1.9	0.71 J	0.73 J	730	28	20	4.7
Total heptachlorodibenzofuran (HpCDF)	ng/kg	17 J	1.7 J	25 J	330 J	16 J	88 J	38 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	340 J	24 J	120 J	700 J	230 J	430 J	250 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	12 J	1.7 J	9.3 J	790 J	15 J	52 J	23 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	38 J	6.2 J	35 J	110 J	54 J	71 J	48 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	6.0 J	1.4 J	3.7 J	880 J	14 J	29 J	12 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	2.5 J	0.98 J	7.2 J	23 J	13 J	3.7 J	8.5 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	16 J	7.6 J	10 J	3700 J	150 J	110 J	25 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	3.5 J	1.6 J	1.9 J	810 J	36 J	27 J	7.9 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	9.45	1.66	3.48	1000	41.7	34.1	10.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	9.45	1.67	3.51	1000	41.1	34.1	10.4

Sample Location:		SJSB060	SJSB060	SJSB060	SJSB060	SJSB060-C1	SJSB060-C1	SJSB060-C1
Sample Identification:	Units	11187072-100819-BN-DUP4	11187072-100819-BN-SJSB060-S (4-6)	11187072-100819-BN-SJSB060-S (6-8)	11187072-100819-BN-SJSB060-S (8-10)	11187072-100819-BN-SJSB060-C1-S (0-2)	11187072-100819-BN-SJSB060-C1-S (2-4)	11187072-100819-BN-SJSB060-C1-S (4-6)
Sample Date:		10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019
Sample Depth:		(4-6) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs
Sample Type:		Duplicate						
Dioxins/Furans								
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	20	1.1 U	2400	13000 J	14	4.2 U	110
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	250	680	22000	6700	2200	350	2600
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	1.3 J	0.60 U	1900	330	6.5	1.1 J	51
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	18	48	1900	490	42	17	270
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.15 U	0.10 U	580	31	0.62 J	0.090 U	6.3 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.56 J	0.39 J	6400	69 J	1.2 J	0.082 U	8.2
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.46 J	0.48 J	14 J	6.9 J	0.54 J	0.24 J	1.9 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.10 U	0.12 U	1600 J	17	0.59 J	0.082 U	4.8 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.1 J	2.2 J	75 J	29	0.95 J	0.87 J	9.7
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.12 U	0.15 U	110 J	0.50 U	0.098 U	0.10 U	0.62 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.0 J	2.1 J	28 J	19	1.9 J	1.4 J	6.0 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.21 J	0.098 U	4600	34	0.14 J	0.11 U	2.4 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.099 U	0.52 U	410	8.9 J	0.38 U	0.33 U	1.3 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.11 U	0.12 U	210 J	8.1 J	0.40 J	0.12 J	1.5 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.10 U	0.42 J	3100	30	0.23 J	0.10 U	1.8 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	1.6 U	7.3	150000 J	1300	0.78 U	0.99 U	19
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	0.86 J	1.4 J	30000 J	540	0.26 J	0.13 J	3.6
Total heptachlorodibenzofuran (HpCDF)	ng/kg	1.9 J	1.1 J	3400 J	700 J	13 J	2.6 J	170 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	50 J	120 J	4200 J	1100 J	120 J	50 J	550 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.94 J	1.4 J	9800 J	320 J	8.3 J	2.0 J	96 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	18 J	28 J	970 J	290 J	17 J	18 J	150 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	0.60 J	0.58 J	13000 J	330 J	3.2 J	0.11 U	40 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	3.0 J	6.2 J	610 J	83 J	2.6 J	6.1 J	29 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	8.2 J	13 J	260000 J	3500 J	2.5 J	2.6 J	59 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	3.8 J	4.8 J	33000 J	620 J	1.2 J	3.0 J	15 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	1.55	3.46	47400	718	2.05	0.679	14.7
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	1.71	3.74	47400	718	2.28	0.924	14.7

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:	Units	SJSB060-C1	SJSB060-C1	SJSB060-C2	SJSB060-C2	SJSB060-C2	SJSB060-C2	SJSB060-C2	SJSB060-C2	SJSB060-C3	SJSB060-C3	SJSB060-C3	SJSB060-C3	SJSB060-C3	SJSB060-C3
Sample Identification:		11187072-100819-BN-SJSB060-C1-S (6-8)	11187072-100819-BN-SJSB060-C1-S (8-10)	11187072-112419-NG-Dup 1	11187072-112419-NG-SJSB060-C2(0-2)	11187072-112419-NG-SJSB060-C2(2-4)	11187072-112419-NG-SJSB060-C2(4-6)	11187072-112419-NG-SJSB060-C2(6-8)	11187072-112419-NG-SJSB060-C2(8-10)	11187072-112419-NG-Dup 2	11187072-112419-NG-SJSB060-C3(0-2)	11187072-112419-NG-SJSB060-C3(2-4)	11187072-112419-NG-SJSB060-C3(4-6)	11187072-112419-NG-SJSB060-C3(6-8)	11187072-112419-NG-SJSB060-C3(8-10)
Sample Date:		10/8/2019	10/8/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019	11/24/2019
Sample Depth:		(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs
Sample Type:				Duplicate						Duplicate					
Dioxins/Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	910	13000	40	65	47	7.6 J	1.8 J	4.0 J	94 J	24 J	35	0.81 U	2.7 J	0.80 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	6600	9300	1500	2900	4400	500	190	170	3800 J	740 J	2200	94	880	150
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	480	340	18	32	37	3.4 J	0.73 J	1.4 J	46 J	10 J	19	0.33 U	0.70 J	0.25 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	560	640	110	130	120	18	8.1	9.1	190 J	60 J	97	5.4 J	27	5.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	140 J	36 J	1.2 J	1.5 J	1.6 J	0.47 U	0.20 U	0.17 U	2.0 J	0.76 J	0.89 J	0.066 U	0.17 U	0.086 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1100	100	2.5 J	3.4 J	5.2 J	2.5 J	0.60 J	0.43 J	5.5 J	1.2 J	2.3 J	0.10 U	0.17 J	0.091 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	8.8 J	7.6 J	1.5 J	1.6 J	1.2 J	0.48 U	0.32 U	0.35 U	2.1 J	0.90 U	0.81 U	0.33 U	0.73 U	0.26 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	340 J	26 J	2.2 J	2.2 J	3.8 J	1.0 J	0.27 J	0.089 U	2.7 J	0.94 J	1.0 J	0.096 U	0.096 J	0.085 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	36 J	34 J	3.8 J	4.4 J	4.0 J	0.47 J	0.33 J	0.35 J	5.9 J	2.6 J	2.2 J	0.28 J	0.71 J	0.21 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	26 J	0.59 U	0.20 U	0.21 U	0.23 U	0.10 U	0.29 U	0.20 U	0.32 U	0.12 U	0.23 U	0.21 U	0.19 U	0.20 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	26 J	18 J	3.5 J	4.4 J	3.7 J	1.0 J	0.67 J	0.74 J	5.8 J	2.0 J	1.8 J	0.50 J	1.7 J	0.36 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	770	56	1.3 J	1.2 J	2.9 J	1.8 J	0.63 U	0.40 U	1.7 J	0.60 U	1.0 U	0.25 U	0.27 U	0.18 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	110 J	13 J	0.51 J	0.68 J	0.89 J	0.39 J	0.19 J	0.080 U	0.72 J	0.34 J	0.45 J	0.089 U	0.13 U	0.097 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	48 J	9.3 J	1.0 J	1.5 J	1.6 J	0.26 J	0.12 J	0.057 U	1.8 J	0.62 J	0.54 J	0.069 U	0.054 U	0.060 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	540	44	0.98 J	1.2 J	2.2 J	1.1 J	0.33 J	0.23 J	1.5 J	0.48 J	0.73 J	0.095 J	0.066 U	0.055 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	27000 J	1600	8.8	16	50	42	11	5.9	16 J	2.9 J	15	0.52 U	0.46 U	0.23 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	9500	760	2.0	3.6	18	16	4.1	2.3	3.4 J	0.75 J	4.5	0.53 J	0.18 J	0.12 J
Total heptachlorodibenzofuran (HpCDF)	ng/kg	1100 J	820 J	45 J	75 J	97 J	8.3 J	1.7 J	4.0 J	110 J	23 J	53 J	0.73 J	1.6 J	0.61 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1200 J	1500 J	270 J	320 J	270 J	54 J	28 J	29 J	440 J	140 J	220 J	20 J	89 J	17 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2100 J	420 J	26 J	40 J	51 J	6.0 J	1.7 J	1.2 J	52 J	13 J	20 J	0.37 J	0.73 J	0.20 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	380 J	310 J	36 J	41 J	39 J	13 J	10 J	11 J	51 J	20 J	25 J	6.7 J	20 J	5.7 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	2400 J	370 J	13 J	23 J	36 J	4.7 J	1.3 J	0.82 J	22 J	6.3 J	6.1 J	0.58 J	0.85 J	0.18 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	230 J	94 J	1.9 J	5.1 J	5.6 J	2.0 J	2.4 J	1.6 J	2.9 J	1.2 J	3.5 J	1.1 J	5.0 J	1.0 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	45000 J	5100 J	11 J	24 J	66 J	49 J	17 J	8.2 J	23 J	3.7 J	21 J	0.77 J	1.7 J	0.36 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	11000 J	860 J	3.3 J	5.9 J	21 J	19 J	6.4 J	3.7 J	5.2 J	1.2 J	7.6 J	1.6 J	3.6 J	1.2 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	12700	984	6.93	10.6	29.5	21.9	5.83	3.27	12.1	3.20	9.29	0.719	0.989	0.272
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	12700	984	6.94	10.6	29.5	21.9	5.87	3.35	12.2	3.26	9.36	0.835	1.14	0.380

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:		SJSB061	SJSB061	SJSB061	SJSB061	SJSB061	SJSB061	SJSB061-C1	SJSB061-C1	SJSB061-C1	SJSB061-C1	SJSB061-C1	SJSB061-C2	SJSB061-C2	SJSB061-C2
Sample Identification:		11187072-091619-BN-SJSB061-S (0-2)	11187072-091619-BN-SJSB061-S (2-4)	11187072-091619-BN-SJSB061-S (4-6)	11187072-091619-BN-SJSB061-S (6-8)	11187072-091619-BN-DUP3	11187072-091619-BN-SJSB061-S (8-10)	11187072-091619-BN-SJSB061-C1-S (0-2)	11187072-091619-BN-SJSB061-C1-S (2-4)	11187072-091619-BN-SJSB061-C1-S (4-6)	11187072-091619-BN-SJSB061-C1-S (6-8)	11187072-091619-BN-SJSB061-C1-S (8-10)	11187072-112319-SS-DUP-1	11187072-112519-SS-SJSB061-C2(0-2)	11187072-112519-SS-SJSB061-C2(2-4)
Sample Date:	Units	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	9/16/2019	11/25/2019	11/25/2019	11/25/2019
Sample Depth:		(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(0-2) ft bgs	(2-4) ft bgs
Sample Type:						Duplicate							Duplicate		
Dioxins/Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	15	16	64	180 J	5.4 J	22	48	150	42	3600	32	4.3 U	15	12
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	720	300	2900	1500	72	81	1000	2400	760	5900	130	950	350	620
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	5.6	3.6 J	22	91 J	0.59 J	3.0 J	17	51	11	340	1.9 J	1.5 J	4.0 J	3.6 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	40	26	160	140 J	3.5 J	5.6 J	71	230	71	550	7.5	15	25	26
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.53 J	0.50 J	4.3 J	24 J	0.29 U	0.68 J	2.3 J	6.3	1.6 J	82	0.50 J	0.63 J	0.43 J	0.29 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.75 J	1.3 J	19	300 J	0.95 J	7.1	7.8	19	6.9	820	3.6	0.59 J	0.13 U	0.43 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.29 J	0.37 J	1.4 J	3.9 U	0.096 J	0.13 J	1.2 J	1.9 J	1.0 J	6.7 J	0.095 J	0.71 J	0.38 U	0.51 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.49 J	0.61 J	4.7 J	63 J	0.25 J	1.6 J	2.7 J	5.8 J	1.9 J	190 J	0.93 J	0.50 J	0.12 U	0.25 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.99 J	1.1 J	5.7 J	3.8 U	0.10 J	0.16 J	3.3	8.1	2.9 J	25 J	0.24 J	0.83 J	0.85 J	0.92 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.11 U	0.17 U	0.44 J	8.0 U	0.075 U	0.12 U	0.30 U	0.69 U	0.24 U	15 J	0.091 J	0.59 J	0.21 J	0.071 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.86 J	1.1 J	4.5 J	3.6 U	0.22 J	0.30 J	3.6	5.7	3.2	16 J	0.48 J	1.5 J	0.72 J	1.1 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.36 J	0.51 J	10	140 J	0.51 J	3.1 J	2.8 J	10	4.7	530	2.4 J	0.40 J	0.16 J	0.16 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.22 J	0.39 J	1.7 J	13 J	0.10 J	0.35 J	0.29 U	2.0 J	0.95 J	55 J	0.40 J	0.47 J	0.090 U	0.24 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.25 J	0.13 U	1.5 J	6.4 U	0.060 U	0.32 J	1.8 J	1.7 J	0.47 J	28 J	0.18 J	0.43 J	0.23 J	0.22 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.45 J	0.55 J	6.5	78 J	0.27 J	1.8 J	2.4 J	6.7	2.6 J	330	1.6 J	0.34 J	0.12 J	0.16 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	3.5	19	220	3500	12 J	74 J	69	250	99	4400	55	1.2	0.41 J	3.4
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	0.92 J	5.1	83	1300	4.2 J	25 J	24	77	37	4200	21	0.54 J	0.075 U	1.1 J
Total heptachlorodibenzofuran (HpCDF)	ng/kg	15 J	14 J	90 J	170 J	1.2 J	5.6 J	49 J	180 J	43 J	680 J	3.9 J	3.8 J	12 J	10 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	91 J	82 J	580 J	290 J	12 J	14 J	190 J	730 J	240 J	1200 J	22 J	41 J	48 J	74 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	8.7 J	10 J	73 J	410 J	1.4 J	11 J	41 J	100 J	32 J	1300 J	6.7 J	3.1 J	3.9 J	3.8 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	13 J	15 J	81 J	32 J	4.0 J	4.7 J	47 J	89 J	58 J	320 J	7.6 J	8.0 J	5.7 J	10 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	7.9 J	6.7 J	47 J	340 J	1.2 J	8.6 J	25 J	56 J	22 J	1600 J	7.4 J	1.4 J	1.6 J	1.3 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.2 J	1.3 J	8.7 J	13 J	0.72 J	0.97 J	4.9 J	7.7 J	8.3 J	110 J	1.9 J	0.60 J	0.38 J	0.50 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	10 J	38 J	460 J	6800 J	25 J	150 J	130 J	430 J	170 J	30000 J	130 J	2.0 J	0.84 J	3.9 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1.6 J	6.7 J	99 J	1400 J	5.4 J	28 J	33 J	92 J	52 J	4700 J	24 J	0.54 J	0.075 U	1.3 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	2.68	8.41	115	1730	5.82	34.5	35.0	114	51.5	4930	28.2	2.22	0.687	2.51
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	2.69	8.43	115	1730	5.83	34.5	35.1	114	51.5	4930	28.2	2.22	0.801	2.54

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Date: Sample Depth: Sample Type:	Units	SJSB061-C2 11187072-112619-SS-SJSB061-C2(4-6) 11/26/2019 (4-6) ft bgs	SJSB061-C2 11187072-112619-SS-SJSB061-C2(6-8) 11/26/2019 (6-8) ft bgs	SJSB061-C2 11187072-112619-SS-SJSB061-C2(8-10) 11/26/2019 (8-10) ft bgs	SJSB062 11187072-091619-BN-SJSB062-S (0-2) 9/16/2019 (0-2) ft bgs	SJSB062 11187072-091619-BN-SJSB062-S (2-4) 9/16/2019 (2-4) ft bgs	SJSB062 11187072-091619-BN-SJSB062-S (4-6) 9/16/2019 (4-6) ft bgs
Dioxins/Furans							
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	73	130	93	54	24	0.90 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	3000	4800	6300	760	620	210
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	28	21	25	13	8.6	0.45 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	170	160	160	58	50	11
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	1.0 J	1.6 J	2.3 J	1.8 J	1.0 J	0.071 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	2.7 J	0.29 U	3.4 J	6.1	3.4 J	0.96 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	2.2 J	1.1 J	1.9 J	0.57 U	0.64 J	0.049 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.7 J	1.0 J	1.9 J	2.5 J	1.3 J	0.24 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	9.2	3.6 J	4.6 J	3.3 J	2.0 J	0.37 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.13 U	0.18 U	0.74 J	0.29 U	0.22 U	0.10 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	6.1 J	2.9 J	4.1 J	2.7 J	2.5 J	0.86 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.89 J	0.11 U	1.3 J	2.7 J	1.5 J	0.42 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.98 J	0.31 J	0.81 J	0.14 U	1.1 U	0.090 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.0 J	0.61 J	1.4 J	0.54 J	0.78 J	0.086 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.86 J	0.50 J	1.1 J	1.9 J	1.5 J	0.21 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	12	0.71 J	1.8	45	27	7.4
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	4.0	0.30 J	0.37 J	12	8.1	2.4
Total heptachlorodibenzofuran (HpCDF)	ng/kg	63 J	100 J	95 J	32 J	26 J	1.1 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	430 J	330 J	490 J	120 J	130 J	40 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	32 J	20 J	43 J	34 J	22 J	2.6 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	77 J	40 J	62 J	25 J	30 J	36 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	16 J	8.9 J	25 J	31 J	16 J	1.6 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	8.6 J	5.5 J	10 J	2.4 J	1.1 U	3.2 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	20 J	5.3 J	18 J	100 J	58 J	15 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	6.0 J	2.6 J	6.3 J	17 J	13 J	18 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	11.7	5.06	7.32	19.7	13.2	3.64
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	11.7	5.08	7.32	19.8	13.7	3.69

Sample Location: Sample Identification: Sample Date: Sample Depth: Sample Type:	Units	SJSB062 11187072-091619-BN-SJSB062-S (6-8) 9/16/2019 (6-8) ft bgs	SJSB062 11187072-091619-BN-SJSB062-S (8-10) 9/16/2019 (8-10) ft bgs	SJSB063 11187072-091619-BN-SJSB063-S (0-2) 9/16/2019 (0-2) ft bgs	SJSB063 11187072-091619-BN-SJSB063-S (2-4) 9/16/2019 (2-4) ft bgs	SJSB063 11187072-091619-BN-SJSB063-S (4-6) 9/16/2019 (4-6) ft bgs	SJSB063 11187072-091619-BN-SJSB063-S (6-8) 9/16/2019 (6-8) ft bgs	SJSB063 11187072-091619-BN-DUP2 9/16/2019 (8-10) ft bgs Duplicate	SJSB063 11187072-091619-BN-SJSB063-S (8-10) 9/16/2019 (8-10) ft bgs
Dioxins/Furans									
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	0.15 U	0.14 U	78	120	83	43	3.1 J	15 J
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	150	100	1600	6900 J	6200	7200 J	1800	1500
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.14 U	0.11 U	23	51	39	21	0.68 J	7.2 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	7.9	6.1 J	140	600	590	1200	56	110
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.034 U	0.042 U	2.0 J	5.0 J	3.8 J	3.0 J	0.17 U	0.89 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.14 J	0.39 J	3.9 J	13	3.6 J	2.4 J	0.084 U	0.90 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.064 U	0.046 U	0.37 U	2.1 J	1.7 J	0.32 U	0.078 U	0.61 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.037 U	0.12 J	2.4 J	6.0 J	2.3 J	1.6 J	0.082 U	0.91 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.063 U	0.048 U	4.0 J	11	12	39	1.3 J	2.9 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.049 U	0.050 U	0.52 U	0.66 U	0.27 U	0.27 U	0.11 U	0.16 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.64 J	0.58 J	3.0 J	6.7	6.0 J	15	2.8 J	2.0 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.086 J	0.39 J	1.4 J	4.9 J	0.93 J	0.62 J	0.16 J	0.32 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.22 J	0.22 J	1.8 U	0.14 U	0.69 U	1.0 J	0.51 J	0.26 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.042 U	0.041 U	1.2 J	2.4 J	1.1 J	0.63 J	0.091 U	0.32 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.026 U	0.16 J	1.7 J	4.3 J	1.2 J	0.73 J	0.094 U	0.50 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	2.1 J	6.0	17	37	8.6	4.1	1.9	4.3 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1.0 J	1.9	6.0	13	2.3	0.50 J	1.0 J	1.3 J
Total heptachlorodibenzofuran (HpCDF)	ng/kg	0.22 J	0.31 J	71 J	170 J	130 J	81 J	1.4 J	25 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	39 J	33 J	320 J	1200 J	1100 J	2000 J	170 J	220 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.14 J	0.50 J	55 J	110 J	52 J	39 J	0.37 J	15 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	34 J	31 J	45 J	93 J	87 J	260 J	41 J	28 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	0.086 J	0.91 J	41 J	61 J	21 J	16 J	0.56 J	11 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	4.9 J	9.1 J	2.2 J	3.9 J	1.8 J	11 J	9.0 J	1.7 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	3.7 J	13 J	66 J	110 J	38 J	22 J	8.0 J	23 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	27 J	28 J	14 J	21 J	7.7 J	3.1 J	6.1 J	3.8 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	1.63	2.98	11.9	30.9	14.4	22.4	3.22	4.29
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	1.65	2.99	12.8	31.0	14.8	22.5	3.26	4.43

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:	Units	SJSB064	SJSB064	SJSB064	SJSB064	SJSB064	SJSB064	SJSB065	SJSB065	SJSB065	SJSB065	SJSB065	SJSB065	SJSB065-C1	SJSB065-C1
Sample Identification:		11187072-100719-BN-SJSB064-S(0-2)	11187072-100719-BN-SJSB064-S(2-4)	11187072-100719-BN-SJSB064-S(4-6)	11187072-100719-BN-SJSB064-S(6-8)	11187072-100719-BN-DUP2A	11187072-100719-BN-SJSB064-S(8-10)	11187072-091219-BN-SJSB065-S(0-2)	11187072-091219-BN-SJSB065-S(2-4)	11187072-091219-BN-SJSB065-S(4-6)	11187072-091219-BN-SJSB065-S(6-8)	11187072-091219-BN-DUP1	11187072-091219-BN-SJSB065-S(8-10)	11187072-100919-BN-SJSB065-C1-5(0-2)	11187072-100919-BN-SJSB065-C1-5(2-4)
Sample Date:		10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	10/9/2019	10/9/2019
Sample Depth:		(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs
Sample Type:						Duplicate						Duplicate			
Dioxins/Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	38	23	140	250	5.2 J	160 J	150 J	58	39	4.8 J	0.60 J	0.31 U	14	41
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	330	800	12000	27000	280 J	7300 J	8600	2500	2200	120	79	84	640	1200
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	18	7.0	59	120	1.1 J	56 J	57 J	110	65	1.0 J	0.15 U	0.20 U	21	82
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	28	48	590	1800	18 J	590 J	350	150	100	4.8 J	3.7 J	3.7 J	39	88
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.46 J	0.82 J	4.3 J	7.4 J	0.71 J	3.8 J	4.5 J	38	24	0.29 U	0.18 U	0.20 U	7.4	34
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	1.1 J	1.5 J	3.4 J	9.1 J	0.27 J	4.9 J	30 J	400	260	1.2 J	0.13 U	0.13 U	74	280
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.43 U	0.63 U	2.0 J	4.4 U	0.57 U	3.6 J	5.3 J	1.4 U	0.66 J	0.21 U	0.21 U	0.19 U	0.48 U	0.65 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.62 J	0.87 J	5.7 J	4.6 J	0.24 J	3.2 J	10 J	110	64	0.31 J	0.13 U	0.13 U	18	66
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.8 J	1.5 J	12	100	0.74 J	17 J	10 J	4.2 J	2.9 J	0.22 U	0.21 U	0.21 U	1.1 J	2.3 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.21 J	0.14 J	0.65 J	0.99 U	0.32 J	0.27 J	2.4 U	7.0 J	5.2 J	0.37 U	0.42 U	0.083 U	1.4 J	4.7 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.93 J	1.2 J	5.3 J	36 J	1.0 J	9.9	10 U	1.4 U	1.3 J	0.45 U	0.19 U	0.19 U	2.0 J	1.4 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.52 J	1.2 J	1.3 J	8.4 J	0.12 J	2.2 J	18 U	370	250	0.26 U	0.22 U	0.24 U	51	180
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.24 J	0.27 J	1.0 J	4.7 J	0.20 J	2.5 J	4.1 U	26	21	0.36 U	0.32 U	0.34 U	3.9 J	14
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.53 J	0.74 J	1.6 J	3.0 J	0.27 J	2.0 J	2.6 U	12	6.8	0.12 U	0.098 U	0.098 U	1.9 J	6.3
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.54 J	1.6 J	1.0 J	8.8 J	0.074 U	2.4 J	12 J	220	160	0.28 U	0.24 U	0.27 U	28	100
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	14	6.6	9.5	740	0.49 J	35 J	450	10000 J	8200 J	19	0.91 U	1.0 U	2000	5300
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	3.9	0.40 J	2.7	200	0.20 J	8.1 J	130	3900 J	3200 J	8.2	0.51 J	0.43 J	600	2000
Total heptachlorodibenzofuran (HpCDF)	ng/kg	32 J	21 J	200 J	390 J	3.3 J	210 J	180 J	190 J	120 J	1.0 J	0.18 U	0.20 U	36 J	150 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	73 J	99 J	1200 J	4300 J	55 J	1100 J	760 J	290 J	200 J	18 J	13 J	13 J	97 J	180 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	12 J	12 J	81 J	220 J	1.8 J	80 J	88 J	610 J	390 J	1.9 J	0.42 J	0.13 U	110 J	410 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	15 J	12 J	94 J	920 J	19 J	180 J	100 J	39 J	25 J	8.9 J	3.8 J	4.5 J	41 J	27 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	4.9 J	13 J	21 J	95 J	0.29 J	34 J	65 J	940 J	670 J	0.68 J	0.24 U	0.27 U	130 J	460 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	1.7 J	1.8 J	8.9 J	89 J	4.0 J	32 J	4.1 U	33 J	28 J	1.1 J	0.42 J	0.34 U	15 J	23 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	24 J	20 J	24 J	1100 J	1.1 J	77 J	680 J	24000 J	19000 J	37 J	1.2 J	3.3 J	3300 J	11000 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	4.8 J	0.40 J	3.7 J	240 J	4.0 J	18 J	150 J	4300 J	3500 J	9.6 J	1.3 J	1.7 J	650 J	2200 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	6.81	3.25	18.2	324	1.02	27.7	191	5060	4130	10.3	0.571	0.492	825	2620
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	6.83	3.28	18.2	325	1.06	27.7	194	5060	4130	10.6	0.887	0.810	825	2620

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:	Units	SJSB065-C1	SJSB065-C1	SJSB065-C1	SJSB066	SJSB066	SJSB066	SJSB066	SJSB066	SJSB066-C1	SJSB066-C1	SJSB066-C1	SJSB066-C1	SJSB066-C1	SJSB067
Sample Identification:		11187072-100919-BN-SJSB065-C1-5(4-6)	11187072-100919-BN-SJSB065-C1-5(6-8)	11187072-100919-BN-SJSB065-C1-5(8-10)	11187072-100819-BN-SJSB066-S (0-2)	11187072-100819-BN-SJSB066-S (2-4)	11187072-100819-BN-SJSB066-S (4-6)	11187072-100819-BN-SJSB066-S (6-8)	11187072-100819-BN-SJSB066-S (8-10)	11187072-091219-BN-SJSB066-CI-S(0-2)	11187072-091219-BN-SJSB066-CI-S(2-4)	11187072-091219-BN-SJSB066-CI-S(4-6)	11187072-091219-BN-SJSB066-CI-S(6-8)	11187072-091219-BN-SJSB066-CI-S(8-10)	11187072-091219-BN-SJSB067-S(0-2)
Sample Date:		10/9/2019	10/9/2019	10/9/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019
Sample Depth:		(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs
Sample Type:															
Dioxins/Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	28	9.2 J	0.93 U	31	1700	5100	270	23	110	29	13	0.32 U	0.25 U	5.4 J
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	710	540	72	380	20000	3800	460	230	1400	380	380	120	2900	4500
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	34	16	0.18 U	13	4600	160	9.2	1.0 J	23	9.7	1.8 J	0.21 U	0.21 U	1.6 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	55	38	3.1 J	29	1600	250	27	13	120	35	14	5.8 J	64	35
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	14	7.3	0.14 J	4.2 J	1800	14	1.1 J	0.15 U	2.2 J	1.9 J	0.28 U	0.22 U	0.23 U	0.27 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	160	97	0.29 J	36	20000	36 J	2.5 J	0.58 J	8.9	12	1.6 J	0.17 U	0.21 U	0.62 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.52 U	0.49 U	0.28 U	0.29 J	7.1 J	3.3 J	0.49 J	0.061 U	1.8 J	0.76 J	0.32 U	0.25 U	1.1 J	0.58 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	39	24	0.13 J	9.2 J	4700	9.3	1.0 J	0.14 J	3.9 J	3.9 J	0.51 J	0.19 U	0.24 U	0.42 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.6 J	1.2 J	0.19 J	0.95 J	52 J	14	1.2 J	0.063 U	4.2 J	2.3 J	0.33 U	0.25 U	1.3 J	0.70 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	2.8 J	2.1 J	0.17 J	0.65 J	340	0.98 J	0.10 U	0.085 U	0.25 U	0.24 U	0.16 U	0.11 U	0.23 J	0.70 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.1 J	1.6 J	0.32 J	0.039 U	17 J	9.4	2.3 J	1.3 J	3.8 J	1.9 J	0.92 J	0.71 J	2.9 J	1.0 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	130	130	0.32 J	21	10000	17	1.4 J	0.29 J	4.5 J	7.5	2.0 J	0.15 U	0.39 J	0.28 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	9.0	6.5	0.10 U	2.3 J	520	3.8 J	0.45 U	0.16 U	0.69 J	1.0 J	0.26 U	0.25 U	0.32 U	0.31 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	4.1 J	3.4 J	0.058 U	1.2 J	500	4.1 J	0.33 J	0.070 U	0.96 J	0.58 J	0.19 U	0.12 U	0.15 U	0.18 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	70	66	0.092 U	14	4800	13	1.1 J	0.27 J	2.6 J	4.7 J	0.88 J	0.16 U	0.21 U	0.27 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	4000	2900	7.7	490	210000 J	580	52	6.4	140	240	30	0.88 J	0.44 J	5.4
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1500	1000	2.1	200	38000 J	210	16	1.9	38	81	10	0.19 U	0.19 U	1.5
Total heptachlorodibenzofuran (HpCDF)	ng/kg	67 J	32 J	0.33 J	25 J	7700 J	320 J	19 J	2.2 J	58 J	17 J	2.9 J	0.22 U	0.23 U	4.3 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130 J	94 J	11 J	62 J	3000 J	650 J	93 J	45 J	220 J	72 J	49 J	20 J	190 J	91 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	240 J	150 J	0.59 J	57 J	28000 J	170 J	12 J	1.1 J	29 J	24 J	2.1 J	0.19 U	0.23 J	3.5 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	26 J	24 J	3.7 J	13 J	390 J	140 J	55 J	15 J	37 J	20 J	12 J	6.9 J	41 J	13 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	310 J	310 J	0.32 J	60 J	25000 J	170 J	16 J	1.9 J	15 J	24 J	3.9 J	0.16 U	1.3 J	0.37 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	16 J	13 J	0.25 J	5.5 J	690 J	38 J	12 J	3.1 J	3.8 J	4.1 J	1.7 J	0.81 J	6.3 J	0.34 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	7600 J	5100 J	14 J	1200 J	360000 J	1400 J	120 J	14 J	230 J	430 J	53 J	3.7 J	3.5 J	8.0 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1700 J	1100 J	2.9 J	220 J	42000 J	250 J	29 J	5.4 J	43 J	92 J	12 J	2.1 J	5.1 J	1.6 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	1960	1330	3.04	262	63900	291	22.9	3.05	57.9	110	13.9	0.253	2.12	4.01
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	1960	1330	3.13	262	63900	291	23.2	3.14	57.9	110	14.1	0.558	2.44	4.29

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:	Units	SJSB067	SJSB067	SJSB067	SJSB067	SJSB067-C1	SJSB067-C1	SJSB067-C1	SJSB067-C1	SJSB067-C1	SJSB068	SJSB068	SJSB068	SJSB068	SJSB068
Sample Identification:		11187072-091219-BN-SJSB067-S(2-4)	11187072-091219-BN-SJSB067-S(4-6)	11187072-091219-BN-SJSB067-S(6-8)	11187072-091219-BN-SJSB067-S(8-10)	11187072-091219-BN-SJSB067-CI-S(0-2)	11187072-091219-BN-SJSB067-CI-S(2-4)	11187072-091219-BN-SJSB067-CI-S(4-6)	11187072-091219-BN-SJSB067-CI-S(6-8)	11187072-091219-BN-SJSB067-CI-S(8-10)	11187072-100819-BN-SJSB068-S (0-2)	11187072-100819-BN-SJSB068-S (2-4)	11187072-100819-BN-SJSB068-S (4-6)	11187072-100819-BN-SJSB068-S (6-8)	11187072-100819-BN-SJSB068-S (8-10)
Sample Date:		9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019
Sample Depth:		(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs	(0-2) ft bgs	(2-4) ft bgs	(4-6) ft bgs	(6-8) ft bgs	(8-10) ft bgs
Sample Type:															
Dioxins/Furans															
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	27	0.26 U	0.54 J	0.24 U	22	0.53 U	0.38 U	0.35 U	0.27 U	93	2.1 U	0.92 U	0.42 U	0.39 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	990	160	110	88	2900	150	100	100	100	890	240	330	400	180
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	40	0.26 U	0.21 U	0.18 U	17	0.21 U	0.087 U	0.11 U	0.10 U	37	0.47 J	0.27 U	0.28 U	0.26 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	73	10	7.9	6.1 J	61	7.6	5.8 J	5.2 J	5.4 J	53	16	17	25	11
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	15	0.25 U	0.25 U	0.20 U	5.1 J	0.051 U	0.088 U	0.040 U	0.093 U	15	0.18 U	0.041 U	0.036 U	0.027 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	160	0.16 U	0.18 U	0.15 U	45	0.28 J	0.11 J	0.040 U	0.039 U	140	0.88 J	0.18 J	0.075 U	0.19 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.59 J	0.56 J	0.57 J	0.42 J	0.63 U	0.28 U	0.36 U	0.31 U	0.24 U	0.099 U	0.054 U	0.13 U	0.12 U	0.067 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	40	0.16 U	0.19 U	0.16 J	11	0.11 J	0.10 J	0.057 J	0.057 J	30	0.23 J	0.044 U	0.071 U	0.045 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.9 J	0.39 J	0.63 J	0.30 J	1.7 J	0.27 J	0.35 J	0.23 J	0.26 J	1.6 J	0.057 U	0.14 U	0.13 U	0.069 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	2.6 J	0.67 U	0.56 U	0.44 U	0.94 J	0.15 U	0.24 U	0.12 U	0.11 U	3.0 J	0.16 J	0.13 J	0.088 U	0.057 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.7 J	1.4 J	1.2 U	0.86 U	1.3 J	0.73 J	0.70 J	0.68 J	0.68 J	2.3 J	2.0 J	0.13 U	0.12 U	1.3 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	140	1.2 U	1.3 U	1.8 U	25	0.18 J	0.19 J	0.053 U	0.042 U	60	0.37 J	0.20 J	0.24 J	0.32 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	10	0.35 U	0.38 U	0.31 U	1.9 J	0.17 J	0.25 J	0.087 U	0.15 J	3.5 J	0.37 U	0.31 U	0.46 U	0.24 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	4.6 J	0.12 U	0.14 U	0.11 U	1.7 J	0.041 U	0.041 U	0.041 U	0.032 U	3.1 J	0.056 U	0.043 U	0.071 U	0.047 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	84	0.28 U	0.68 J	0.83 J	11	0.15 J	0.064 U	0.055 U	0.045 U	25	0.16 J	0.051 U	0.037 U	0.20 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	5100 J	6.3	2.6	5.8	550	2.5	0.50 J	0.14 U	0.14 U	650	2.2	1.1 J	0.73 J	0.88 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1600 J	2.0	0.34 J	0.50 J	120	0.90 J	0.17 J	0.11 J	0.059 U	230	0.80 J	0.12 U	0.10 U	0.081 J
Total heptachlorodibenzofuran (HpCDF)	ng/kg	75 J	0.26 U	0.25 U	0.20 U	35 J	0.34 J	0.18 J	0.11 J	0.19 J	77 J	0.87 J	0.35 J	0.28 J	0.26 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	140 J	32 J	25 J	20 J	130 J	28 J	20 J	18 J	23 J	140 J	58 J	66 J	85 J	38 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	240 J	0.67 J	0.56 J	0.61 J	71 J	0.54 J	0.45 J	0.21 J	0.17 J	210 J	1.3 J	0.31 J	0.088 U	0.31 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	31 J	13 J	10 J	8.0 J	18 J	11 J	6.5 J	6.4 J	12 J	33 J	24 J	40 J	30 J	14 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	360 J	3.4 J	3.8 J	6.5 J	60 J	0.33 J	0.19 J	0.064 U	0.053 U	130 J	1.0 J	0.90 J	1.2 J	1.1 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	16 J	3.0 J	1.9 J	3.0 J	5.5 J	2.4 J	1.1 J	1.6 J	4.0 J	9.9 J	5.9 J	10 J	7.6 J	3.2 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	8600 J	32 J	21 J	54 J	910 J	14 J	3.2 J	0.69 J	0.35 J	1300 J	9.3 J	6.8 J	5.9 J	5.9 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	1700 J	9.4 J	4.3 J	7.3 J	140 J	4.5 J	1.8 J	2.3 J	8.7 J	270 J	6.7 J	28 J	5.8 J	3.0 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	2170	3.01	1.04	1.50	189	1.63	0.690	0.289	0.334	327	1.64	0.416	0.450	0.552
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	2170	3.31	1.36	1.77	189	1.66	0.732	0.375	0.400	327	1.84	0.665	0.771	0.687

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 3

Second Phase Pre-Design Investigation Analytical Results - Southern Impoundment
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Date: Sample Depth: Sample Type:	Units	SJSB068-C1 11187072-100819-BN-SJSB068-C1-S (0-2) 10/8/2019 (0-2) ft bgs	SJSB068-C1 11187072-100819-BN-SJSB068-C1-S (2-4) 10/8/2019 (2-4) ft bgs	SJSB068-C1 11187072-100819-BN-SJSB068-C1-S (4-6) 10/8/2019 (4-6) ft bgs	SJSB068-C1 11187072-100819-BN-SJSB068-C1-S (6-8) 10/8/2019 (6-8) ft bgs	SJSB068-C1 11187072-100819-BN-SJSB068-C1-S (8-10) 10/8/2019 (8-10) ft bgs	SJSB069 11187072-100819-BN-SJSB069-S (0-2) 10/8/2019 (0-2) ft bgs	SJSB069 11187072-100819-BN-SJSB069-S (2-4) 10/8/2019 (2-4) ft bgs	SJSB069 11187072-100819-BN-SJSB069-S (4-6) 10/8/2019 (4-6) ft bgs	SJSB069 11187072-100819-BN-SJSB069-S (6-8) 10/8/2019 (6-8) ft bgs	SJSB069 11187072-100819-BN-SJSB069-S (8-10) 10/8/2019 (8-10) ft bgs
Dioxins/Furans											
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ng/kg	10 J	680	10 J	13000 J	270	99	2.4 U	1.4 U	0.59 U	0.34 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ng/kg	1200	1100	20000 J	9000 J	700	2200	260	300	350	180
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ng/kg	1.5 J	21	2.5 J	310	7.5	43	0.69 J	0.35 U	0.19 U	0.22 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ng/kg	26	52	100	550	32	200	18	17	25	9.7
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ng/kg	0.18 J	3.2 J	0.23 J	36	0.56 J	5.5 J	0.13 U	0.079 U	0.078 U	0.046 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.58 J	4.4 J	0.28 J	57	1.6 J	24	0.42 J	0.14 J	0.29 J	0.049 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.45 J	0.75 J	0.90 J	7.5	0.63 J	2.4 J	0.10 U	0.96 U	0.62 U	0.078 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.28 J	1.6 J	0.070 U	18 J	0.67 J	7.7 J	0.20 J	0.14 J	0.24 J	0.052 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	0.57 J	2.2 J	1.3 J	28	1.3 J	5.7 J	0.11 U	1.1 U	0.99 J	0.086 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.071 U	0.15 U	0.097 U	1.5 U	0.12 U	0.46 J	0.063 U	0.10 J	0.20 J	0.064 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ng/kg	1.5 J	2.5 J	1.6 J	20	2.6 J	6.9	0.10 U	1.9 J	2.7 J	1.0 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.36 J	2.3 J	0.11 U	31	0.96 J	8.4	0.29 J	0.28 J	1.0 J	0.040 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	0.41 J	0.84 J	0.47 J	10 J	0.56 J	1.9 J	0.32 U	0.37 J	0.58 J	0.20 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ng/kg	0.058 U	0.50 J	0.082 U	6.4 J	0.10 U	2.7 J	0.052 U	0.041 U	0.045 U	0.054 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ng/kg	0.39 J	2.1 J	0.10 U	28	0.61 J	6.5	0.19 J	0.046 U	0.40 J	0.037 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ng/kg	8.3	100	0.81 J	1100	37	170	7.5	1.0 U	1.6 J	0.29 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	3.4	32	0.36 J	480	11	50	1.9 J	0.17 J	0.21 J	0.089 U
Total heptachlorodibenzofuran (HpCDF)	ng/kg	4.4 J	46 J	6.4 J	660 J	16 J	95 J	1.7 J	0.59 J	0.19 J	0.22 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	94 J	150 J	240 J	1300 J	110 J	660 J	70 J	54 J	82 J	71 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2.9 J	28 J	2.7 J	320 J	10 J	80 J	1.0 J	0.38 J	0.92 J	0.064 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	36 J	43 J	25 J	300 J	39 J	94 J	26 J	18 J	29 J	35 J
Total pentachlorodibenzofuran (PeCDF)	ng/kg	3.8 J	44 J	0.85 J	410 J	18 J	49 J	0.75 J	1.6 J	8.7 J	0.040 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	ng/kg	6.7 J	8.8 J	4.6 J	76 J	7.3 J	12 J	6.7 J	4.1 J	6.4 J	7.5 J
Total tetrachlorodibenzofuran (TCDF)	ng/kg	21 J	220 J	2.4 J	3000 J	77 J	320 J	15 J	8.8 J	22 J	0.88 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	ng/kg	11 J	42 J	3.1 J	570 J	21 J	62 J	11 J	5.5 J	7.7 J	8.7 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	ng/kg	5.75	46	8.35	638	16.8	79.3	3.04	1.04	1.90	0.251
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	ng/kg	5.75	46	8.38	639	16.9	79.3	3.22	1.20	1.93	0.437

Notes:
ng/kg - nanograms per kilogram
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)	DWA (ng/kg)
Remedial Investigation			
SJSB001	(0-0.5) ft bgs	1.59	27.48
	(0.5-1) ft bgs	3.53	
	(1-2) ft bgs	5.32	
	(2-4) ft bgs	1.16	
	(4-6) ft bgs	5.15	
	(6-8) ft bgs	11.5	
	(8-10) ft bgs	164.1	
SJSB002	(0-0.5) ft bgs	7.29	11.89
	(0.5-1) ft bgs	3.4	
	(1-2) ft bgs	2.74	
	(2-4) ft bgs	2.81	
	(4-6) ft bgs	49.5	
	(6-8) ft bgs	16.7	
	(8-10) ft bgs	0.819	
SJSB003	(0-0.5) ft bgs	16.6	18.33
	(0.5-1) ft bgs	8.55	
	(1-2) ft bgs	7.58	
	(2-4) ft bgs	0.244	
	(6-8) ft bgs	4.13	
	(8-10) ft bgs	72.9	
SJSB004	(0-0.5) ft bgs	3.25	12.49
	(0.5-1) ft bgs	4.84	
	(1-2) ft bgs	1.57	
	(2-4) ft bgs	6.4	
	(4-6) ft bgs	1.26	
	(6-8) ft bgs	28.2	
	(8-10) ft bgs	41.9	
SJSB005	(0-0.5) ft bgs	3.91	10.29
	(0.5-1) ft bgs	9.38	
	(1-2) ft bgs	3.59	
	(2-4) ft bgs	35.1	
	(4-6) ft bgs	9.4	
	(6-8) ft bgs	6.14	
	(8-10) ft bgs	4.54	
SJSB006	(0-0.5) ft bgs	23.7	105.59
	(0.5-1) ft bgs	38.8	
	(1-2) ft bgs	15	
	(2-4) ft bgs	59.3	
	(4-6) ft bgs	21.5	
	(6-8) ft bgs	513.1	
	(8-10) ft bgs	67.7	
SJSB007	(0-0.5) ft bgs	6.59	16.54
	(0.5-1) ft bgs	2.16	
	(1-2) ft bgs	2.86	
	(2-4) ft bgs	38.5	
	(4-6) ft bgs	35.8	
	(6-8) ft bgs	13.3	
SJSB008	(0-2) ft bgs	3.26	402.81
	(2-4) ft bgs	32.1	
	(4-6) ft bgs	13.6	
	(6-8) ft bgs	1880.2	
	(8-10) ft bgs	84.9	
SJSB009	(0-2) ft bgs	11.1	199.52
	(2-4) ft bgs	26.8	
	(4-6) ft bgs	26.2	
	(6-8) ft bgs	514.9	
	(8-10) ft bgs	418.6	
SJSB012	(0.5-1) ft bgs	12.6	2015.95
	(1-2) ft bgs	0.1338	
	(2-4) ft bgs	5.77	
	(4-6) ft bgs	6528.3	
	(6-8) ft bgs	4991.6	
	(8-10) ft bgs	557.3	
SJSB013	(0.5-1) ft bgs	12.8	181.63
	(1-2) ft bgs	12.6	
	(2-4) ft bgs	13	
	(4-6) ft bgs	300	
	(6-8) ft bgs	489.1	
	(8-10) ft bgs	262.3	
SJSB014	(0-0.5) ft bgs	31.7	24.14
	(0.5-1) ft bgs	26.8	
	(1-2) ft bgs	6.99	
	(2-4) ft bgs	9.08	
	(4-5) ft bgs	15.2	
	(7-8) ft bgs	33.7	
	(8-10) ft bgs	45.5	

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)		DWA (ng/kg)	
SJSB015	(0-0.5) ft bgs	15.6		30.82	
	(0.5-1) ft bgs	4.64			
	(1-2) ft bgs	2.91			
	(2-4) ft bgs	15.5			
	(4-6) ft bgs	78.4			
	(6-8) ft bgs	44.6			
	(8-10) ft bgs	54.1			
SJSB016	(0-0.5) ft bgs	6.22		48.14	
	(0.5-1) ft bgs	8.77			
	(1-2) ft bgs	0.674			
	(2-3) ft bgs	13.4			
	(7-8) ft bgs	50.2			
	(8-10) ft bgs	209.6			
SJSB017	(0.5-1) ft bgs	19.3		18.44	
	(1-2) ft bgs	15.7			
	(2-4) ft bgs	27			
	(4-6) ft bgs	20.2			
	(6-6.5) ft bgs	9.99			
SJSB018	(0-0.5) ft bgs	14.2		31.92	
	(0.5-1) ft bgs	29.6			
	(1-2) ft bgs	62.4			
	(2-4) ft bgs	22.2			
	(6-8) ft bgs	31.2			
SJSB019	(0.5-1) ft bgs	12.8		8363.93	
	(1-2) ft bgs	12.6			
	(2-4) ft bgs	13			
	(4-6) ft bgs	13.4			
	(6-6.5) ft bgs	26.7			
	(8.2-10) ft bgs	50105.1			
SJSB020	(0.5-1) ft bgs	24.9		9.64	
	(1-2) ft bgs	11.6			
	(2-4) ft bgs	0.9579			
	(4-5) ft bgs	8.29			
	(7.5-8) ft bgs	6.79			
	(8-10) ft bgs	5.32			
SJSB021	(0.5-1) ft bgs	9.28		8.84	
	(1-2) ft bgs	3.49			
	(2-4) ft bgs	1.12			
	(4-6) ft bgs	3.45			
	(6-8) ft bgs	8.99			
	(8-10) ft bgs	26.7			
SJSB022	(0.5-1) ft bgs	4.58		5.77	
	(1-2) ft bgs	6.64			
	(2-4) ft bgs	11.6			
	(4-6) ft bgs	8.58			
	(6-8) ft bgs	2.08			
	(8-10) ft bgs	1.14			
SJSB023	(0-0.5) ft bgs	36.9		5572.69	
	(0.5-1) ft bgs	36.8			
	(1-2) ft bgs	303.2			
	(2-4) ft bgs	2381			
	(4-6) ft bgs	35465.9			
	(6-8) ft bgs	331.5			
	(8-10) ft bgs	453.5			
SJSB024	(0.5-1) ft bgs	14.1		72.53	
	(1-2) ft bgs	3			
	(2-4) ft bgs	79.4			
	(4-6) ft bgs	272.3			
	(6-8) ft bgs	64.4			
	(8-10) ft bgs	1.96			
SJSB025	(0.5-1) ft bgs	6.74		474.03	
	(1-2) ft bgs	2.1			
	(2-4) ft bgs	717.4			
	(4-6) ft bgs	2052			
	(6-8) ft bgs	65.4			
	(8-10) ft bgs	0.5517			
SJSB026	(0-0.5) ft bgs	11.2		88.67	
	(0.5-1) ft bgs	21.1			
	(1-2) ft bgs	23.5			
	(2-4) ft bgs	22			
	(4-5) ft bgs	194.6			
	(6-8) ft bgs	324.8			
	(8-10) ft bgs	23.5			
SJSB027	(0-0.5) ft bgs	20.8		8.08	
	(0.5-1) ft bgs	14.9			
	(1-2) ft bgs	9.05			
	(2-4) ft bgs	4.43			
	(4-5) ft bgs	0.524			
	(7-8) ft bgs	4.37			
	(8-10) ft bgs	2.47			

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)	DWA (ng/kg)
First Phase Pre-Design Investigation			
SJSB008-S1	(0-2) ft bgs	35.3	5236.88
	(2-4) ft bgs	13.1	
	(4-6) ft bgs	115	
	(6-8) ft bgs	25300	
	(8-10) ft bgs	721	
SJSB008-S2	(0-2) ft bgs	18.1	9821.70
	(2-4) ft bgs	17	
	(4-6) ft bgs	33.8	
	(6-8) ft bgs	39.6	
	(8-10) ft bgs	49000	
SJSB012-N1	(0-2) ft bgs	28.2	236.83
	(2-4) ft bgs	6.75	
	(4-6) ft bgs	37.2	
	(6-8) ft bgs	707	
	(8-10) ft bgs	405	
SJSB012-N2	(0-2) ft bgs	14.8	5593.21
	(2-4) ft bgs	9.65	
	(4-6) ft bgs	41.6	
	(6-8) ft bgs	15700	
	(8-10) ft bgs	12200	
SJSB012-W1	(0-2) ft bgs	23.4	2224.10
	(4-6) ft bgs	4410	
	(6-8) ft bgs	4460	
	(8-10) ft bgs	3.01	
SJSB012-W2	(0-2) ft bgs	15.2	3608.22
	(2-4) ft bgs	3.65	
	(4-6) ft bgs	18000	
	(6-8) ft bgs	15.9	
	(8-10) ft bgs	6.36	
SJSB019-E1	(0-2) ft bgs	7.43	44892.97
	(2-4) ft bgs	609	
	(4-6) ft bgs	48.4	
	(6-8) ft bgs	206000	
	(8-10) ft bgs	17800	
SJSB019-E2	(0-2) ft bgs	25.8	1022.50
	(2-4) ft bgs	47.4	
	(4-6) ft bgs	5010	
	(6-8) ft bgs	18.3	
	(8-10) ft bgs	11	
SJSB019-N1	(0-2) ft bgs	14.6	9884.36
	(2-4) ft bgs	48.7	
	(4-6) ft bgs	5720	
	(6-8) ft bgs	43600	
	(8-10) ft bgs	38.5	
SJSB019-N2	(0-2) ft bgs	10.6	42258.70
	(2-4) ft bgs	220	
	(4-6) ft bgs	199000	
	(6-8) ft bgs	12000	
	(8-10) ft bgs	62.9	
SJSB019-S1	(0-2) ft bgs	16.1	37711.42
	(2-4) ft bgs	471	
	(4-6) ft bgs	187000	
	(6-8) ft bgs	678	
	(8-10) ft bgs	392	
SJSB019-S2	(0-2) ft bgs	393	127.01
	(2-4) ft bgs	14.6	
	(4-6) ft bgs	9.63	
	(6-8) ft bgs	198	
	(8-10) ft bgs	19.8	
SJSB019-W1	(0-2) ft bgs	58	27407.24
	(2-4) ft bgs	20800	
	(4-6) ft bgs	115000	
	(6-8) ft bgs	1160	
	(8-10) ft bgs	18.2	
SJSB019-W2	(0-2) ft bgs	65.8	17.87
	(2-4) ft bgs	14.6	
	(4-6) ft bgs	2.29	
	(6-8) ft bgs	4.04	
	(8-10) ft bgs	2.62	
SJSB023-E1	(0-2) ft bgs	130	415.16
	(2-4) ft bgs	481	
	(4-6) ft bgs	1250	
	(6-8) ft bgs	203	
	(8-10) ft bgs	11.8	
SJSB023-E2	(0-2) ft bgs	111	79.61
	(2-4) ft bgs	260	
	(4-6) ft bgs	9.6	
	(6-8) ft bgs	6.94	
	(8-10) ft bgs	10.5	

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)		DWA (ng/kg)	
SJSB023-N1	(0-2) ft bgs	46.7		18594.18	
	(2-4) ft bgs	3880			
	(4-6) ft bgs	88300			
	(6-8) ft bgs	709			
	(8-10) ft bgs	35.2			
SJSB023-N2	(0-2) ft bgs	28.6		36.69	
	(2-4) ft bgs	141			
	(4-6) ft bgs	4.43			
	(6-8) ft bgs	4.63			
	(8-10) ft bgs	4.81			
SJSB023-S1	(0-2) ft bgs	1570		17098.20	
	(2-4) ft bgs	47800			
	(4-6) ft bgs	35800			
	(6-8) ft bgs	139			
	(8-10) ft bgs	182			
SJSB023-S2	(0-2) ft bgs	13700		12338.58	
	(2-4) ft bgs	47700			
	(4-6) ft bgs	213			
	(6-8) ft bgs	47			
	(8-10) ft bgs	32.9			
SJSB023-W1	(0-2) ft bgs	8110		24713.31	
	(2-4) ft bgs	71300			
	(5-6) ft bgs	63500			
	(6-8) ft bgs	26.8			
	(8-10) ft bgs	23.1			
SJSB023-W2	(0-2) ft bgs	8600		5346.29	
	(2-4) ft bgs	16900			
	(4-6) ft bgs	1210			
	(6-8) ft bgs	18.4			
	(8-10) ft bgs	3.03			
SJSB025-N1	(0-2) ft bgs	198		5056.54	
	(2-4) ft bgs	16100			
	(4-6) ft bgs	6930			
	(6-8) ft bgs	1970			
	(8-10) ft bgs	84.7			
SJSB025-N2	(0-2) ft bgs	26.1		3050.00	
	(2-4) ft bgs	3770			
	(4-6) ft bgs	10100			
	(6-8) ft bgs	1320			
	(8-10) ft bgs	33.9			
SJSB025-S1	(0-2) ft bgs	145		2809.96	
	(2-4) ft bgs	13500			
	(5-6) ft bgs	84.8			
	(6-8) ft bgs	318			
	(8-10) ft bgs	2.02			
SJSB025-S2	(4-6) ft bgs	96.2		33.28	
	(6-8) ft bgs	2.03			
	(8-10) ft bgs	1.62			
SJSB039	(0-2) ft bgs	17.1		1621.18	
	(2-4) ft bgs	21.9			
	(4-6) ft bgs	866			
	(6-8) ft bgs	7190			
	(8-10) ft bgs	10.9			
SJSB040	(0-2) ft bgs	23.9		418.72	
	(2-4) ft bgs	33.9			
	(4-6) ft bgs	59.6			
	(6-8) ft bgs	76.2			
	(8-10) ft bgs	1900			
SJSB041	(0-2) ft bgs	20.9		4797.72	
	(2-4) ft bgs	19500			
	(4-6) ft bgs	4320			
	(6-8) ft bgs	61.1			
	(8-10) ft bgs	86.6			

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)		DWA (ng/kg)	
Second Phase Pre-Design Investigation					
SJSB059	(0-2) ft bgs	9.45	🟢	211.25	🟢
	(2-4) ft bgs	1.67	🟢		
	(4-6) ft bgs	3.51	🟢		
	(6-8) ft bgs	1000.56	🔴		
	(8-10) ft bgs	41.07	🟢		
SJSB060	(0-2) ft bgs	34.14	🟢	9627.88	🔴
	(2-4) ft bgs	10.41	🟢		
	(4-6) ft bgs	3.74	🟢		
	(6-8) ft bgs	47372.82	🔴		
	(8-10) ft bgs	718.27	🔴		
SJSB060-C1	(0-2) ft bgs	2.28	🟢	2733.96	🔴
	(2-4) ft bgs	0.92	🟢		
	(4-6) ft bgs	14.74	🟢		
	(6-8) ft bgs	12667.63	🔴		
	(8-10) ft bgs	984.25	🔴		
SJSB060-C2	(0-2) ft bgs	10.56	🟢	14.24	🟢
	(2-4) ft bgs	29.52	🟢		
	(4-6) ft bgs	21.89	🟢		
	(6-8) ft bgs	5.87	🟢		
	(8-10) ft bgs	3.35	🟢		
SJSB060-C3	(0-2) ft bgs	3.26	🟢	3.00	🟢
	(2-4) ft bgs	9.36	🟢		
	(4-6) ft bgs	0.84	🟢		
	(6-8) ft bgs	1.14	🟢		
	(8-10) ft bgs	0.38	🟢		
SJSB061	(0-2) ft bgs	2.69	🟢	378.45	🔴
	(2-4) ft bgs	8.43	🟢		
	(4-6) ft bgs	115.43	🟢		
	(6-8) ft bgs	1731.24	🔴		
	(8-10) ft bgs	34.47	🟢		
SJSB061-C1	(0-2) ft bgs	35.12	🟢	1032.30	🔴
	(2-4) ft bgs	114.2	🟢		
	(4-6) ft bgs	51.5	🟢		
	(6-8) ft bgs	4932.54	🔴		
	(8-10) ft bgs	28.16	🟢		
SJSB061-C2	(0-2) ft bgs	2.22	🟢	5.77	🟢
	(2-4) ft bgs	2.54	🟢		
	(4-6) ft bgs	11.67	🟢		
	(6-8) ft bgs	5.08	🟢		
	(8-10) ft bgs	7.32	🟢		
SJSB062	(0-2) ft bgs	19.75	🟢	8.36	🟢
	(2-4) ft bgs	13.71	🟢		
	(4-6) ft bgs	3.69	🟢		
	(6-8) ft bgs	1.65	🟢		
	(8-10) ft bgs	2.99	🟢		
SJSB063	(0-2) ft bgs	12.8	🟢	17.10	🟢
	(2-4) ft bgs	31.03	🟢		
	(4-6) ft bgs	14.79	🟢		
	(6-8) ft bgs	22.45	🟢		
	(8-10) ft bgs	4.43	🟢		
SJSB064	(0-2) ft bgs	6.83	🟢	76.13	🟢
	(2-4) ft bgs	3.28	🟢		
	(4-6) ft bgs	18.23	🟢		
	(6-8) ft bgs	324.58	🔴		
	(8-10) ft bgs	27.71	🟢		
SJSB065	(0-2) ft bgs	193.94	🟢	1879.79	🔴
	(2-4) ft bgs	5060.31	🔴		
	(4-6) ft bgs	4133.15	🔴		
	(6-8) ft bgs	10.64	🟢		
	(8-10) ft bgs (DUP)	0.89	🟢		
SJSB065-C1	(0-2) ft bgs	824.56	🔴	1347.11	🔴
	(2-4) ft bgs	2617.91	🔴		
	(4-6) ft bgs	1956.04	🔴		
	(6-8) ft bgs	1333.93	🔴		
	(8-10) ft bgs	3.13	🟢		
SJSB066	(0-2) ft bgs	261.55	🔴	12897.36	🔴
	(2-4) ft bgs	63908.12	🔴		
	(4-6) ft bgs	290.83	🔴		
	(6-8) ft bgs	23.18	🟢		
	(8-10) ft bgs	3.14	🟢		
SJSB066-C1	(0-2) ft bgs	57.89	🟢	37.07	🟢
	(2-4) ft bgs	110.38	🟢		
	(4-6) ft bgs	14.08	🟢		
	(6-8) ft bgs	0.56	🟢		
	(8-10) ft bgs	2.44	🟢		

Table 4

Sample Interval Results
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location	Sample Depth	Total WHO Dioxin TEQ (Human/Mammal) (ND=0.5) (ng/kg)		DWA (ng/kg)	
SJSB067	(0-2) ft bgs	4.29	🟢	436.57	🔴
	(2-4) ft bgs	2172.12	🔴		
	(4-6) ft bgs	3.31	🟢		
	(6-8) ft bgs	1.36	🟢		
	(8-10) ft bgs	1.77	🟢		
SJSB067-C1	(0-2) ft bgs	188.85	🟢	38.40	🟢
	(2-4) ft bgs	1.66	🟢		
	(4-6) ft bgs	0.73	🟢		
	(6-8) ft bgs	0.37	🟢		
	(8-10) ft bgs	0.4	🟢		
SJSB068-C1	(0-2) ft bgs	5.75	🟢	143.21	🟢
	(2-4) ft bgs	46	🟢		
	(4-6) ft bgs	8.38	🟢		
	(6-8) ft bgs	639	🔴		
	(8-10) ft bgs	16.9	🟢		
SJSB069	(0-2) ft bgs	79.26	🟢	17.21	🟢
	(2-4) ft bgs	3.22	🟢		
	(4-6) ft bgs	1.2	🟢		
	(6-8) ft bgs	1.93	🟢		
	(8-10) ft bgs	0.44	🟢		

Notes:
ft bgs - feet below ground surface
DWA - Depth Weighted Average
ng/kg - nanograms per kilogram
🟢 - Value is less than 240 ng/kg
🔴 - Value is equal to or greater than 240 ng/kg

Table 5

Treatability Soil Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: / Sample Identification: / Sample Date: / Parameters	Units	SITS-01 1187072-SITS-01 10/17/2019	SITS-02 1187072-SITS-02 10/17/2019	SITS-03 1187072-SITS-03 10/17/2019
TCLP-Dioxins/Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	7.7 U	17 J	9.5 J
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	33 U	58 U	30 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	6.0 U	5.5 J	1.8 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	3.4 U	6.6 J	5.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	7.6 U	5.8 J	1.7 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	3.1 U	3.2 J	1.6 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	16 U	11 U	7.4 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	3.2 U	1.9 U	1.5 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	4.6 U	4.0 J	1.3 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	2.3 U	5.6 J	1.0 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	4.2 U	3.3 J	1.2 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	5.3 U	1.4 U	1.2 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	8.3 U	1.8 U	1.7 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	2.5 U	4.9 J	1.0 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	5.6 U	1.5 U	1.2 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	3.1 U	6.8 J	5.9 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	3.4 U	2.0 U	1.9 U
Total heptachlorodibenzofuran (HpCDF)	pg/L	7.6 U	11 J	1.8 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	11 U	10 J	5.0 J
Total hexachlorodibenzofuran (HxCDF)	pg/L	3.2 U	14 J	1.6 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	30 J	18 J	7.4 U
Total pentachlorodibenzofuran (PeCDF)	pg/L	6.0 U	1.5 U	1.5 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	8.3 U	1.8 U	1.7 U
Total tetrachlorodibenzofuran (TCDF)	pg/L	3.1 U	11 J	9.0 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	4.4 J	2.0 U	1.9 U
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/L	0	2.96	0.661
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/L	8.81	5.77	3.42
TCLP-Herbicides				
2,4,5-TP (Silvex)	mg/L	0.0030 U	0.0030 U	0.0030 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.020 U	0.020 U	0.020 U
Dinoseb	mg/L	0.038 U	0.038 U	0.038 U
TCLP-Metals				
Arsenic	mg/L	0.041 U	0.041 U	0.041 U
Barium	mg/L	0.64 J	0.35 J	1.2 J
Cadmium	mg/L	0.0028 U	0.0028 U	0.0028 U
Chromium	mg/L	0.0078 U	0.0078 U	0.0078 U
Lead	mg/L	0.029 UJ	0.029 UJ	0.029 UJ
Mercury	mg/L	0.00010 U	0.00010 U	0.00010 U
Selenium	mg/L	0.058 J	0.036 U	0.036 U
Silver	mg/L	0.0085 UJ	0.0085 UJ	0.0085 UJ
TCLP- Polychlorinated biphenyls (PCBs)				
Aroclor-1016 (PCB-1016)	mg/L	0.00019 U	0.00019 U	0.00019 U
Aroclor-1221 (PCB-1221)	mg/L	0.00022 U	0.00023 U	0.00022 U
Aroclor-1232 (PCB-1232)	mg/L	0.00020 U	0.00021 U	0.00020 U
Aroclor-1242 (PCB-1242)	mg/L	0.00036 U	0.00036 U	0.00036 U
Aroclor-1248 (PCB-1248)	mg/L	0.00012 U	0.00012 U	0.00012 U
Aroclor-1254 (PCB-1254)	mg/L	0.00037 U	0.00038 U	0.00037 U
Aroclor-1260 (PCB-1260)	mg/L	0.00015 U	0.00016 U	0.00015 U
TCLP-Pesticides				
4,4'-DDD	mg/L	0.00021 U	0.00021 U	0.00021 U
4,4'-DDE	mg/L	0.00012 U	0.00012 U	0.00012 U
4,4'-DDT	mg/L	0.00012 U	0.00012 U	0.00012 U
Chlordane	mg/L	0.0029 U	0.0029 U	0.0029 U
Dieldrin	mg/L	0.00011 U	0.00011 U	0.00011 U
Endosulfan I	mg/L	0.00027 U	0.00027 U	0.00027 U
Endosulfan II	mg/L	0.00013 U	0.00013 U	0.00013 U
Endosulfan sulfate	mg/L	0.00026 U	0.00026 U	0.00026 U
Endrin	mg/L	0.000091 U	0.000091 U	0.000091 U
gamma-BHC (lindane)	mg/L	0.00012 U	0.00012 U	0.00012 U
Heptachlor	mg/L	0.00018 U	0.00018 U	0.00018 U
Heptachlor epoxide	mg/L	0.00014 U	0.00014 U	0.00014 U
Methoxychlor	mg/L	0.00031 U	0.00031 U	0.00031 U
Mirex	mg/L	0.000084 U	0.000084 U	0.000084 U
Toxaphene	mg/L	0.020 U	0.020 U	0.020 U
Glycols				
2-Ethoxyethanol	mg/L	2.5 U	2.5 U	2.5 U
Ethylene glycol	mg/L	1.9 U	1.9 U	1.9 U
Ethylene glycol monomethyl ether (2-methyoxyethanol)	mg/L	2.4 U	2.4 U	2.4 U

Table 5

Treatability Soil Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: / Sample Identification: / Sample Date:	Units	SITS-01 / 1187072-SITS-01 / 10/17/2019	SITS-02 / 1187072-SITS-02 / 10/17/2019	SITS-03 / 1187072-SITS-03 / 10/17/2019
Parameters				
TCLP-Semi-Volatile Organic Compounds (SVOCs)				
1,4-Dichlorobenzene	mg/L	0.0045 U	0.0045 U	0.0045 U
2,4,5-Trichlorophenol	mg/L	0.0079 U	0.0079 U	0.0079 U
2,4,6-Trichlorophenol	mg/L	0.0095 U	0.0095 U	0.0095 U
2,4-Dinitrotoluene	mg/L	0.0079 U	0.0079 U	0.0079 U
2-Methylphenol	mg/L	0.0040 U	0.0040 U	0.0040 U
3&4-Methylphenol	mg/L	0.0079 U	0.0079 U	0.0079 U
Hexachlorobenzene	mg/L	0.0055 U	0.0055 U	0.0055 U
Hexachlorobutadiene	mg/L	0.0084 U	0.0084 U	0.0084 U
Hexachloroethane	mg/L	0.0040 U	0.0040 U	0.0040 U
Nitrobenzene	mg/L	0.012 U	0.012 U	0.012 U
Pentachlorophenol	mg/L	0.0075 U	0.0075 U	0.0075 U
Pyridine	mg/L	0.0082 U	0.0082 U	0.0082 U
TCLP-Volatile Organic Compounds (VOCs)				
1,1,1,2-Tetrachloroethane	mg/L	0.16 U	0.16 U	0.16 U
1,1,1-Trichloroethane	mg/L	0.10 U	0.10 U	0.10 U
1,1,2,2-Tetrachloroethane	mg/L	0.12 U	0.12 U	0.12 U
1,1,2-Trichloroethane	mg/L	0.096 U	0.096 U	0.096 U
1,1-Dichloroethene	mg/L	0.11 U	0.11 U	0.11 U
1,2,3-Trichloropropane	mg/L	0.11 U	0.11 U	0.11 U
1,2-Dibromoethane (Ethylene dibromide)	mg/L	0.11 U	0.11 U	0.11 U
1,2-Dichloroethane	mg/L	0.058 U	0.058 U	0.058 U
1,3-Dichloropropene	mg/L	0.13 U	0.13 U	0.13 U
1,4-Dichlorobenzene	mg/L	0.041 U	0.041 U	0.041 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	0.12 U	0.12 U	0.12 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	0.074 U	0.074 U	0.074 U
Acetone	mg/L	0.13 U	0.13 U	0.13 U
Acetonitrile	mg/L	2.0 U	2.0 U	2.0 U
Acrylonitrile	mg/L	1.3 U	1.3 U	1.3 U
Benzene	mg/L	0.079 U	0.079 U	0.079 U
Bromodichloromethane	mg/L	0.094 U	0.094 U	0.094 U
Bromoform	mg/L	0.10 U	0.10 U	0.10 U
Bromomethane (Methyl bromide)	mg/L	0.18 U	0.18 U	0.18 U
Carbon disulfide	mg/L	0.12 U	0.12 U	0.12 U
Carbon tetrachloride	mg/L	0.13 U	0.13 U	0.13 U
Chlorobenzene	mg/L	0.063 U	0.063 U	0.063 U
Chloroform (Trichloromethane)	mg/L	0.085 U	0.085 U	0.085 U
Dichlorodifluoromethane (CFC-12)	mg/L	0.12 U	0.12 U	0.12 U
Ethylbenzene	mg/L	0.086 U	0.086 U	0.086 U
Hexachlorobutadiene	mg/L	0.073 U	0.073 U	0.073 U
Isobutanol (isobutyl alcohol)	mg/L	3.6 U	3.6 U	3.6 U
Methyl acrylonitrile	mg/L	1.6 U	1.6 U	1.6 U
Methylene chloride	mg/L	0.15 U	0.15 U	0.15 U
Styrene	mg/L	0.053 U	0.053 U	0.053 U
Tetrachloroethene	mg/L	0.080 U	0.080 U	0.080 U
Toluene	mg/L	0.067 U	0.067 U	0.067 U
trans-1,3-Dichloropropene	mg/L	0.069 U	0.069 U	0.069 U
Trichloroethene	mg/L	0.060 U	0.060 U	0.060 U
Trichlorofluoromethane (CFC-11)	mg/L	0.058 U	0.058 U	0.058 U
Vinyl chloride	mg/L	0.15 U	0.15 U	0.15 U
Xylenes (total)	mg/L	0.17 U	0.17 U	0.17 U
General Chemistry				
Cyanide (total)	mg/kg	1.2	1.2	0.35 U
Free liquid	none	CNF	CNF	CNF
Ignitability	Deg F	140	140	140
Percent solids	%	61.0	61.8	74.4
pH, lab	s.u.	9.6	10	7.9
Sulfide	mg/kg	1200	850	16 J

Notes:
- pg/L - picograms per Liter
- mg/L - milligrams per Liter
- mg/kg - milligrams per kilogram
- Deg F - Degrees in Fahrenheit
- s.u. - standard unit
- TCLP - Toxicity Characteristic Leaching Procedure
- CNF - Contains no free liquid
- U - Not detected at the associated reporting limit.
- J - Estimated concentration.
- UJ - Not detected; associated reporting limit is estimated.

Table 6

Treatability Water Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location:	Units	Estimated Discharge Criteria [1, 2]	EXC-1	INF3	INF 3	CEFF	FEFF	SI Contact - Initial
Sample Identification:			11187072-091319-LL-EXC-1	INF 3	INF 4	1. CEFF	FEFF 1	11187072-S.IMPD.CONTACT INITIAL
Sample Description:			North Impoundment Excavation Seepage	Contact Water (Tank 1)	Contact Water (Tank 2)	Clarified Effluent	Filtered Effluent	South Impoundment Borehole Water
Dioxins/Furans								
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	100	5.8 U	590	370 J-	6.4 U	5.5 U	22000
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	100	90 J	15000 J+	8800 J	44 U	44 U	310000
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	50	6.9 U	880 J-	600 J-	2.9 U	1.9 U	2800
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	50	4.1 U	840	540 J-	4.9 J	6.7 J	43000
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	50	1.8 U	320	240 J-	1.4 U	1.3 U	130
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	19 J	3100	2500 J-	3.9 J	1.6 J	260
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	0.82 U	11 U	4.9 U	2.6 U	0.83 U	69
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	5.6 J	790	650 J-	1.7 J	0.77 U	120
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	0.83 U	30 J	20 J-	1.6 J	0.79 U	920
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	50	0.68 U	53	40 J-	2.0 U	0.52 U	11 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	0.74 U	18 J-	8.5 J-	1.4 U	0.73 U	300
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	50	11 J	2100	1900	2.5 J	1.5 J	100
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	50	1.1 U	160	130	0.94 U	0.99 U	32 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	0.73 U	93	73 J-	1.2 U	0.52 U	38 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	50	6.2 J	1200	1100	0.65 U	0.63 U	73
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	10	220	50000	46000	37	7.1 J	3800
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	10	61	18000	15000	13	3.2 J	1000
Total heptachlorodibenzofuran (HpCDF)	pg/L	50	11 J	1600 J	1100 J	4.3 J	1.9 J	10000 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	50	10 J	2000 J	1300 J	8.2 J	13 J	88000 J
Total hexachlorodibenzofuran (HxCDF)	pg/L	50	25 J	4600 J	3800 J	8.8 J	1.6 J	2900 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	0.83 U	260 J	180 J	5.6 J	0.83 U	7400 J
Total pentachlorodibenzofuran (PeCDF)	pg/L	50	26 J	5000 J	4600 J	2.5 J	1.5 J	860 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	50	1.1 U	190 J	160 J	0.94 U	0.99 U	430 J
Total tetrachlorodibenzofuran (TCDF)	pg/L	10	390 J	100000 J	100000 J	68 J	11 J	6000 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	10	66 J	20000 J	16000 J	13 J	3.2 J	1200 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/L		87.7	24000	20500	17.5	4.18	2170
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/L		88.5	24000	20500	18.5	5.00	2170
Dioxins/Furans (dissolved)								
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (dissolved)	pg/L	100	2.1 U	*170*	*11 U*	13 J	22 J	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (dissolved)	pg/L	100	17 UJ	*5400 J+*	*280 J+*	21 U	29 U	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (dissolved)	pg/L	50	3.6 J	*240*	*12 J*	2.5 J	6.0 J	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD) (dissolved)	pg/L	50	1.1 U	*250*	*27 J*	2.4 J	6.4 J	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF) (dissolved)	pg/L	50	2.8 J	*88*	*4.9 U*	1.1 U	4.9 J	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF) (dissolved)	pg/L	50	7.6 J	*750*	*31 J*	0.91 U	3.1 J	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (dissolved)	pg/L	50	1.2 U	*4.6 U*	*3.1 U*	2.9 J	4.9 J	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) (dissolved)	pg/L	50	2.7 J	*190*	*9.8 J*	0.89 U	3.5 J	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) (dissolved)	pg/L	50	1.2 U	*6.7 J*	*2.1 J*	1.1 U	4.4 J	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF) (dissolved)	pg/L	50	2.0 U	*14 J*	*4.8 U*	1.9 J	3.8 J	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) (dissolved)	pg/L	50	1.1 U	*5.7 J*	*1.7 U*	0.97 U	4.8 J	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) (dissolved)	pg/L	50	3.4 U	*450*	*20 J*	1.2 U	3.2 J	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD) (dissolved)	pg/L	50	1.6 U	*40 J*	*3.0 J*	3.1 J	4.6 J	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) (dissolved)	pg/L	50	0.71 U	*23 J*	*2.8 U*	1.5 J	3.0 J	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) (dissolved)	pg/L	50	1.7 U	*250*	*11 J*	1.2 U	1.3 U	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF) (dissolved)	pg/L	10	21	*11000*	*540 J*	2.7 J	1.1 U	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (dissolved)	pg/L	10	7.1 J	*3800*	*150 J*	1.1 U	1.6 U	--
Total heptachlorodibenzofuran (HpCDF) (dissolved)	pg/L	50	6.4 J	*430 J*	*20 J*	2.5 J	11 J	--
Total heptachlorodibenzo-p-dioxin (HpCDD) (dissolved)	pg/L	50	1.1 U	*630 J*	*51 J*	2.4 J	6.4 J	--
Total hexachlorodibenzofuran (HxCDF) (dissolved)	pg/L	50	12 J	*1100 J*	*48 J*	3.4 J	13 J	--
Total hexachlorodibenzo-p-dioxin (HxCDD) (dissolved)	pg/L	50	1.2 U	*74 J*	*6.9 J*	2.9 J	14 J	--
Total pentachlorodibenzofuran (PeCDF) (dissolved)	pg/L	50	3.4 J	*1100 J*	*44 J*	1.3 U	3.2 J	--
Total pentachlorodibenzo-p-dioxin (PeCDD) (dissolved)	pg/L	50	1.6 U	*51 J*	*3.0 J*	4.4 J	4.6 J	--
Total tetrachlorodibenzofuran (TCDF) (dissolved)	pg/L	10	39 J	*21000 J*	*920 J*	2.7 J	1.1 U	--
Total tetrachlorodibenzo-p-dioxin (TCDD) (dissolved)	pg/L	10	7.1 J	*4000 J*	*170 J*	1.1 U	1.6 U	--
Herbicides								
2,4,5-TP (Silvex)	ug/L	NL	0.020 U	--	--	--	--	--
2,4-Dichlorophenoxyacetic acid (2,4-D)	ug/L	NL	0.040 U	--	--	--	--	--

Table 6

Treatability Water Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Description:	Units	Estimated Discharge Criteria [1, 2]	EXC-1 11187072-091319-LL-EXC-1 North Impoundment Excavation Seepage	INF3 INF 3 Contact Water (Tank 1)	INF 3 INF 4 Contact Water (Tank 2)	CEFF 1. CEFF Clarified Effluent	FEFF FEFF 1 Filtered Effluent	SI Contact - Initial 11187072-S.IMPD.CONTACT INITIAL South Impoundment Borehole Water
Metals								
Aluminum	mg/L	NL	--	--	--	--	--	320
Antimony	mg/L	25.623	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.049 J
Arsenic	mg/L	0.164	0.089	0.026	0.023	0.0029 U	0.0029 U	0.16
Barium	mg/L	N/A	2.1	1.1	0.96	0.29	0.28	2.8
Beryllium	mg/L	NL	0.00042 U	0.0074	0.0062	0.00042 U	0.00042 U	0.0098
Boron	mg/L	NL	1.1	0.26	0.25	0.21	0.20	--
Cadmium	mg/L	0.0439	0.00080 J	0.0028 J	0.0025 J	0.00040 J	0.00028 U	0.019
Calcium	mg/L	NL	250	130	120	55	53	1500
Chromium	mg/L	0.389	0.0017 J	0.12	0.11	0.0016 U	0.0016 U	0.90 J
Cobalt	mg/L	NL	0.0066 J	0.051	0.043	0.00040 J	0.00031 U	0.094
Copper	mg/L	0.0167	0.0081 U	0.11	0.093	0.0081 U	0.0081 U	1.2
Iron	mg/L	NL	13	110	88	0.29 J	0.13 J	590
Lead	mg/L	0.107	0.0022 U	0.12	0.098	0.0022 U	0.0022 U	3.4
Magnesium	mg/L	NL	250	58	54	33	31	70
Manganese	mg/L	NL	2.7	1.1	1.0	0.088	0.029	9.3
Mercury	mg/L	0.000598	--	--	--	--	--	0.011
Mercury	ng/L	598	--	28 J	6.3 J	18 J	2.5 J	--
Mercury	ug/L		0.10 U	--	--	--	--	--
Molybdenum	mg/L	NL	0.0068 J	0.0084 J	0.0090 J	0.010	0.010	0.14 J
Nickel	mg/L	0.103	0.0036 J	0.095	0.081	0.0021 J	0.0020 J	0.27 J
Phosphorus	mg/L	NL	--	--	--	--	--	7.8
Potassium	mg/L	NL	27	25	23	12	12	90
Selenium	mg/L	0.619	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.018 J
Silver	mg/L	0.00493	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0046 J
Sodium	mg/L	NL	2400	340	350	350	360	150
Strontium	mg/L	NL	2.5	0.84	0.79	0.48	0.46	3.9
Thallium	mg/L	0.5	0.00014 U	0.0042 U	0.0042 U	0.0042 U	0.026 U	0.0090 UJ
Tin	mg/L	NL	0.00059 U	0.0048 J	0.0057 J	0.00059 U	0.00059 U	--
Titanium	mg/L	NL	0.0077 J	0.23	0.22	0.0011 J	0.00070 J	--
Vanadium	mg/L	NL	0.00047 U	0.20	0.17	0.0036 J	0.0028 J	0.51
Zinc	mg/L	0.165	0.031	0.40	0.36	0.045	0.036	9.7
Metals (dissolved)								
Aluminum (dissolved)	mg/L	NL	--	--	--	0.048 U	0.048 U	0.22
Antimony (dissolved)	mg/L	25.623	0.0039 U	0.0039 U	0.0039 U	0.0098 U	0.0098 U	0.015 J
Arsenic (dissolved)	mg/L	0.164	0.037	0.014	0.0041 J	0.012 U	0.012 U	0.012 U
Barium (dissolved)	mg/L	N/A	1.9	0.55	0.30	0.30	0.32	0.12
Beryllium (dissolved)	mg/L	NL	0.00042 U	0.0026 J	0.00042 U	0.00030 U	0.00030 U	0.00030 U
Boron (dissolved)	mg/L	NL	1.1	0.22	0.20	--	--	--
Cadmium (dissolved)	mg/L	0.0439	0.00080 J	0.0013 J	0.00040 J	0.00050 U	0.00050 U	0.00050 U
Calcium (dissolved)	mg/L	NL	240	67	55	59	57	79 J
Chromium (dissolved)	mg/L	0.389	0.0016 U	0.048	0.0039 J	0.0012 U	0.0012 U	0.0012 U
Cobalt (dissolved)	mg/L	NL	0.0064 J	0.017	0.0012 J	0.0030 U	0.0030 U	0.0030 U
Copper (dissolved)	mg/L	0.0167	0.0081 U	0.036	0.0081 U	0.0072 J	0.0053 J	0.013
Iron (dissolved)	mg/L	NL	0.12 J	40	2.9	0.056 J	0.020 U	0.20
Lead (dissolved)	mg/L	0.107	0.0022 U	0.037	0.0022 U	0.0025 U	0.0025 U	0.0047 J
Magnesium (dissolved)	mg/L	NL	250	42	32	32	31	24
Manganese (dissolved)	mg/L	NL	2.6	0.34	0.035	0.064	0.028	0.0047 J
Mercury (dissolved)	mg/L	0.000598	--	--	--	--	--	0.00010 U
Mercury (dissolved)	ng/L	598	--	--	22 J	1.7	1.7	--
Mercury (dissolved)	ug/L	0.598	0.10 U	--	--	--	--	--
Molybdenum (dissolved)	mg/L	NL	0.011	0.0084 J	0.010	0.010 J	0.0096 J	0.052
Nickel (dissolved)	mg/L	0.103	0.0050 J	0.033	0.0030 J	0.0024 U	0.0024 U	0.0062
Phosphorus (dissolved)	mg/L	NL	--	--	--	0.050 U	0.050 U	0.091 J
Potassium (dissolved)	mg/L	NL	27	17	13	14	13	43
Selenium (dissolved)	mg/L	0.619	0.0029 U	0.0029 U	0.0029 U	0.013 U	0.013 U	0.013 UJ
Silver (dissolved)	mg/L	0.00493	0.0013 U	0.0013 U	0.0013 U	0.00084 U	0.00084 U	0.00084 U
Sodium (dissolved)	mg/L	NL	2400	340	350	330	330	140
Strontium (dissolved)	mg/L	NL	2.4	0.57	0.47	0.51	0.49	0.53

Table 6

Treatability Water Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Description:	Units	Estimated Discharge Criteria [1, 2]	EXC-1 11187072-091319-LL-EXC-1 North Impoundment Excavation Seepage	INF3 INF 3 Contact Water (Tank 1)	INF 3 INF 4 Contact Water (Tank 2)	CEFF 1. CEFF Clarified Effluent	FEFF FEFF 1 Filtered Effluent	SI Contact - Initial 11187072-S.IMPD.CONTACT INITIAL South Impoundment Borehole Water
Thallium (dissolved)	mg/L	0.5	0.00014 U	0.0042 U	0.0042 U	0.0090 U	0.0090 U	0.0090 U
Tin (dissolved)	mg/L	NL	0.0014 J	0.0012 J	0.00059 U	--	--	--
Titanium (dissolved)	mg/L	NL	0.0022 J	0.17	0.025	--	--	--
Vanadium (dissolved)	mg/L	NL	0.00047 U	0.086	0.012	0.0038 J	0.0035 J	0.0019 U
Zinc (dissolved)	mg/L	0.165	0.015 U	0.15	0.026 J	0.012	0.014	0.14
Polychlorinated biphenyl (PCBs)								
Aroclor-1016 (PCB-1016)	ug/L	NL	0.56 U	--	--	--	--	0.19 U
Aroclor-1221 (PCB-1221)	ug/L	NL	0.46 U	--	--	--	--	0.23 U
Aroclor-1232 (PCB-1232)	ug/L	NL	0.13 U	--	--	--	--	0.21 U
Aroclor-1242 (PCB-1242)	ug/L	NL	0.17 U	--	--	--	--	0.37 U
Aroclor-1248 (PCB-1248)	ug/L	NL	0.21 U	--	--	--	--	0.12 U
Aroclor-1254 (PCB-1254)	ug/L	NL	0.15 U	--	--	--	--	0.38 U
Aroclor-1260 (PCB-1260)	ug/L	NL	0.35 U	--	--	--	--	0.16 U
Polychlorinated biphenyl (PCBs) (dissolved)								
Aroclor-1016 (PCB-1016) (dissolved)	ug/L	NL	0.64 U	--	--	--	--	--
Aroclor-1221 (PCB-1221) (dissolved)	ug/L	NL	0.52 U	--	--	--	--	--
Aroclor-1232 (PCB-1232) (dissolved)	ug/L	NL	0.14 U	--	--	--	--	--
Aroclor-1242 (PCB-1242) (dissolved)	ug/L	NL	0.19 U	--	--	--	--	--
Aroclor-1248 (PCB-1248) (dissolved)	ug/L	NL	0.24 U	--	--	--	--	--
Aroclor-1254 (PCB-1254) (dissolved)	ug/L	NL	0.17 U	--	--	--	--	--
Aroclor-1260 (PCB-1260) (dissolved)	ug/L	NL	0.40 U	--	--	--	--	--
Pesticides								
alpha-Chlordane	ug/L	NL	0.10 U	--	--	--	--	--
Chlordane	ug/L	NL	0.13 U	--	--	--	--	--
Endrin	ug/L	NL	0.015 U	--	--	--	--	--
gamma-BHC (lindane)	ug/L	NL	0.013 U	--	--	--	--	--
gamma-Chlordane	ug/L	NL	0.015 U	--	--	--	--	--
Heptachlor	ug/L	NL	0.013 U	--	--	--	--	--
Heptachlor epoxide	ug/L	NL	0.015 U	--	--	--	--	--
Hexachlorobenzene	ug/L	NL	--	--	--	--	--	--
Methoxychlor	ug/L	NL	0.019 U	--	--	--	--	--
Toxaphene	ug/L	NL	5.1 U	--	--	--	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	NL	--	--	--	--	--	0.58 U
2,4,5-Trichlorophenol	ug/L	NL	4.4 U	--	--	--	--	0.61 U
2,4,6-Trichlorophenol	ug/L	NL	3.5 U	--	--	--	--	0.68 U
2,4-Dichlorophenol	ug/L	NL	--	--	--	--	--	0.51 U
2,4-Dimethylphenol	ug/L	NL	--	--	--	--	--	0.41 U
2,4-Dinitrophenol	ug/L	NL	--	--	--	--	--	15 U
2,4-Dinitrotoluene	ug/L	NL	2.2 U	--	--	--	--	0.51 U
2,6-Dinitrotoluene	ug/L	NL	2.9 U	--	--	--	--	0.60 U
2-Chloronaphthalene	ug/L	NL	--	--	--	--	--	0.59 U
2-Chlorophenol	ug/L	NL	--	--	--	--	--	0.64 U
2-Methylnaphthalene	ug/L	NL	--	--	--	--	--	0.62 U
2-Methylphenol	ug/L	NL	1.5 U	--	--	--	--	3.0 U
2-Nitroaniline	ug/L	NL	--	--	--	--	--	5.5 U
2-Nitrophenol	ug/L	NL	--	--	--	--	--	0.61 U
3&4-Methylphenol	ug/L	NL	1.4 U	--	--	--	--	3.7 U
3,3'-Dichlorobenzidine	ug/L	NL	--	--	--	--	--	5.8 U
3-Nitroaniline	ug/L	NL	--	--	--	--	--	0.67 U
4,6-Dinitro-2-methylphenol	ug/L	NL	--	--	--	--	--	15 U
4-Bromophenyl phenyl ether	ug/L	NL	--	--	--	--	--	0.63 U
4-Chloro-3-methylphenol	ug/L	NL	--	--	--	--	--	0.61 U
4-Chloroaniline	ug/L	NL	--	--	--	--	--	0.44 U
4-Chlorophenyl phenyl ether	ug/L	NL	--	--	--	--	--	0.61 U
4-Nitroaniline	ug/L	NL	--	--	--	--	--	0.58 U
4-Nitrophenol	ug/L	NL	--	--	--	--	--	1.4 U
Acenaphthene	ug/L	NL	--	--	--	--	--	0.65 U
Acenaphthylene	ug/L	NL	--	--	--	--	--	0.65 U

Table 6

Treatability Water Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Description:	Units	Estimated Discharge Criteria [1, 2]	EXC-1 11187072-091319-LL-EXC-1 North Impoundment Excavation Seepage	INF3 INF 3 Contact Water (Tank 1)	INF 3 INF 4 Contact Water (Tank 2)	CEFF 1. CEFF Clarified Effluent	FEFF FEFF 1 Filtered Effluent	SI Contact - Initial 11187072-S.IMPD.CONTACT INITIAL South Impoundment Borehole Water
Acetophenone	ug/L	NL	--	--	--	--	--	0.62 U
Anthracene	ug/L	NL	--	--	--	--	--	0.49 U
Atrazine	ug/L	NL	--	--	--	--	--	6.3 U
Benzaldehyde	ug/L	NL	--	--	--	--	--	1.1 U
Benzo(a)anthracene	ug/L	NL	--	--	--	--	--	0.75 U
Benzo(a)pyrene	ug/L	NL	--	--	--	--	--	0.53 U
Benzo(b)fluoranthene	ug/L	NL	--	--	--	--	--	0.97 U
Benzo(g,h,i)perylene	ug/L	NL	--	--	--	--	--	0.69 U
Benzo(k)fluoranthene	ug/L	NL	--	--	--	--	--	0.88 U
Biphenyl (1,1-Biphenyl)	ug/L	NL	--	--	--	--	--	0.59 U
bis(2-Chloroethoxy)methane	ug/L	NL	--	--	--	--	--	0.67 U
bis(2-Chloroethyl)ether	ug/L	NL	--	--	--	--	--	0.40 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	NL	--	--	--	--	--	62 U
Butyl benzylphthalate (BBP)	ug/L	NL	--	--	--	--	--	4.6 U
Caprolactam	ug/L	NL	--	--	--	--	--	4.7 U
Carbazole	ug/L	NL	--	--	--	--	--	0.51 U
Chrysene	ug/L	NL	--	--	--	--	--	0.81 U
Dibenz(a,h)anthracene	ug/L	NL	--	--	--	--	--	0.72 U
Dibenzofuran	ug/L	NL	--	--	--	--	--	0.73 U
Diethyl phthalate	ug/L	NL	--	--	--	--	--	5.7 U
Dimethyl phthalate	ug/L	NL	--	--	--	--	--	0.56 U
Di-n-butylphthalate (DBP)	ug/L	NL	--	--	--	--	--	7.4 U
Di-n-octyl phthalate (DnOP)	ug/L	NL	--	--	--	--	--	6.9 U
Fluoranthene	ug/L	NL	--	--	--	--	--	0.60 U
Fluorene	ug/L	NL	--	--	--	--	--	0.69 U
Hexachlorobenzene	ug/L	NL	3.4 U	--	--	--	--	0.56 U
Hexachlorobutadiene	ug/L	NL	2.7 U	--	--	--	--	0.69 U
Hexachlorocyclopentadiene	ug/L	NL	--	--	--	--	--	5.0 U
Hexachloroethane	ug/L	NL	3.4 U	--	--	--	--	0.62 U
Indeno(1,2,3-cd)pyrene	ug/L	NL	--	--	--	--	--	0.85 U
Isophorone	ug/L	NL	--	--	--	--	--	0.54 U
Naphthalene	ug/L	NL	--	--	--	--	--	0.59 U
Nitrobenzene	ug/L	NL	2.7 U	--	--	--	--	5.0 U
N-Nitrosodi-n-propylamine	ug/L	NL	--	--	--	--	--	0.71 U
N-Nitrosodiphenylamine	ug/L	NL	--	--	--	--	--	1.2 U
Pentachlorophenol	ug/L	NL	3.3 U	--	--	--	--	8.5 U
Phenanthrene	ug/L	NL	--	--	--	--	--	0.55 U
Phenol	ug/L	NL	--	--	--	--	--	4.9 U
Pyrene	ug/L	NL	--	--	--	--	--	0.54 U
Pyridine	ug/L	NL	2.3 U	--	--	--	--	5.4 U
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	ug/L	NL	--	--	--	--	--	2.5 U
1,1,2-Trichloroethane	ug/L	NL	--	--	--	--	--	2.4 U
1,1-Dichloroethane	ug/L	NL	--	--	--	--	--	1.8 U
1,1-Dichloroethene	ug/L	NL	0.76 U	--	--	--	--	2.9 U
1,2,4-Trichlorobenzene	ug/L	NL	--	--	--	--	--	3.7 U
1,2-Dichlorobenzene	ug/L	NL	--	--	--	--	--	2.0 U
1,2-Dichloroethane	ug/L	NL	1.0 U	--	--	--	--	1.5 U
1,2-Dichloropropane	ug/L	NL	--	--	--	--	--	2.5 U
1,3-Dichlorobenzene	ug/L	NL	--	--	--	--	--	1.6 U
1,4-Dichlorobenzene	ug/L	NL	0.91 U	--	--	--	--	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	NL	1.6 U	--	--	--	--	2.9 U
Benzene	ug/L	NL	0.56 U	--	--	--	--	2.0 U
Bromodichloromethane	ug/L	NL	--	--	--	--	--	2.4 U
Bromoform	ug/L	NL	--	--	--	--	--	2.6 U
Carbon disulfide	ug/L	NL	1.7 U	--	--	--	--	--
Carbon tetrachloride	ug/L	NL	0.92 U	--	--	--	--	3.3 U
Chlorobenzene	ug/L	NL	0.82 U	--	--	--	--	1.6 U
Chloroethane	ug/L	NL	--	--	--	--	--	2.6 U

Table 6

Treatability Water Characterization
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Sample Location: Sample Identification: Sample Description:	Units	Estimated Discharge Criteria [1, 2]	EXC-1 11187072-091319-LL-EXC-1 North Impoundment Excavation Seepage	INF3 INF 3 Contact Water (Tank 1)	INF 3 INF 4 Contact Water (Tank 2)	CEFF 1. CEFF Clarified Effluent	FEFF FEFF 1 Filtered Effluent	SI Contact - Initial 11187072-S.IMPD.CONTACT INITIAL South Impoundment Borehole Water
Chloroform (Trichloromethane)	ug/L	NL	0.82 U	--	--	--	--	2.1 U
cis-1,2-Dichloroethene	ug/L	NL	--	--	--	--	--	1.6 U
cis-1,3-Dichloropropene	ug/L	NL	--	--	--	--	--	1.6 U
Ethylbenzene	ug/L	NL	--	--	--	--	--	2.2 U
Hexachlorobutadiene	ug/L	NL	1.2 U	--	--	--	--	--
m&p-Xylenes	ug/L	NL	1.3 U	--	--	--	--	1.9 U
o-Xylene	ug/L	NL	0.93 U	--	--	--	--	2.4 U
Tetrachloroethene	ug/L	NL	1.2 U	--	--	--	--	2.0 U
Toluene	ug/L	NL	--	--	--	--	--	1.7 U
trans-1,2-Dichloroethene	ug/L	NL	--	--	--	--	--	2.5 U
trans-1,3-Dichloropropene	ug/L	NL	--	--	--	--	--	1.7 U
Trichloroethene	ug/L	NL	1.6 U	--	--	--	--	1.5 U
Vinyl chloride	ug/L	NL	0.85 U	--	--	--	--	3.7 U
Xylenes (total)	ug/L	NL	2.0 U	--	--	--	--	4.3 U
General Chemistry								
Alkalinity (as CaCO3 pH=4.5)	mg/L	NL	--	--	--	--	--	--
Alkalinity, bicarbonate	mg/L	NL	1000	190 J	170 J	160 J	140	--
Alkalinity, carbonate	mg/L	NL	20 U	20 UJ	20 UJ	20 UJ	20 U	--
Alkalinity, total (as CaCO3)	mg/L	NL	1000	190 J	170 J	160 J	140	--
Ammonia-N	mg/L	NL	7.1	0.073 J	0.23	0.067 U	0.067 U	2.6
Biochemical oxygen demand (BOD)	mg/L	NL	10 U	--	--	--	--	--
Bromide	mg/L	NL	9.9	0.12 J	0.15 J	0.20 J	0.30 J	--
Chemical oxygen demand (COD)	mg/L	NL	82	170	310	27	16	93
Chloride	mg/L	NL	4200	540	500	480	820	--
Cyanide (total)	ug/L	NL	3.1 U	--	--	--	--	--
Ferrous iron	mg/L	NL	0.016 UJ	--	--	--	--	--
Fluoride	mg/L	NL	--	1.2 U	0.26 J	0.34	0.060 UJ	--
Hydrogen sulfide	mg/L	NL	0.048 U	--	--	--	--	--
Nitrate (as N)	mg/L	NL	0.025 U	R	R	R	R	--
Nitrite (as N)	mg/L	NL	0.030 U	R	R	R	R	--
Oil and grease (HEM), total	mg/L	NL	--	2.0 J	2.1 J	--	--	--
Oil and grease (SGT HEM), non-polar material	mg/L	NL	--	1.0 U	1.0 U	--	--	--
pH, lab	s.u.	NL	6.9 J	8.2 J	7.9 J	7.7 J	7.8 J	7.7 J
Phosphorus	mg/L	NL	0.031 J	1.1	0.25	0.066	0.095	--
Phosphorus, total (as PO4)	mg/L	NL	0.095 J	3.3	0.77	0.20	0.29	--
Sulfate	mg/L	NL	6.5	37	36	1.9 U	62	--
Sulfide	mg/L	NL	0.045 U	0.57	0.061	0.0090 U	0.0090 U	--
TOC average duplicates	mg/L	NL	--	--	--	--	--	36
Total dissolved solids (TDS)	mg/L	NL	8800	980	1100	1300	1300	50 U
Total organic carbon (TOC)	mg/L	NL	24	17 J	9.2 J	5.0 J	4.3 J	--
Total suspended solids (TSS)	mg/L	30	240	3500	4600	11	2.2	--

Notes:
-- Data not available
NL - No discharge limit expected
[1] Per an EPA email dated February 18, 2020, compliance with the Texas Surface Water Quality Standards will be determined using the minimum level of the EPA approved method (1613B), cited in 40 CFR Part 136, in sampling of dioxin concentrations for surface water discharges during the site remedial action.
[2] Estimated discharge criteria were calculated for all parameters except dioxins and furans utilizing the TCEQ model, TEXTOX MENU # 5 for bays or wide tidal rivers.
Samples shown in italics were not filtered with 0.45 micron filter and are not directly comparable to other filtered results.
pg/L - picograms per Liter
mg/L - milligrams per Liter
ug/L - micrograms per Liter
s.u. - standard unit
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.
J- - Estimated concentration, result may be biased low
J+ - Estimated concentration, result may be biased high.

Table 7

Treatability Particle Size Analysis by Filtration
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Filter Size: Sample Identification:	Units	Minimum Level of EPA Method 1613B[1]	100 µm 11187072-Filter Test-1	10 µm 11187072-Filter Test-3	1 µm 11187072-Filter Test-4	0.45 µm 11187072-Filter Test-5	0.1 µm 11187072-Filter Test-6
Dioxins/Furans							
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	10	800	270	3.6 J	<0.76	<0.65
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	10	2500	820	8.7 J	1.6 J	0.93 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	50	9.4 J	4.2 J	<0.92	<1	<1.2
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	50	100	39 J	<0.53	<0.6	<0.64
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	50	59	22 J	<0.56	<0.57	<0.66
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	<2.7	<1.7	<2	<1.9	<1.9
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	<2.7	<0.84	<0.45	<0.62	<1.3
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	50	<2.3	<0.60	<0.71	<0.57	<1.5
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	210	74	<1.1	<0.6	<1.2
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	53	20 J	<0.44	<1.2	<0.86
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	50	<4.5	<2.1	<0.67	<0.75	<1.1
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	50	7.0 J	<2.8	<0.36	<0.94	<0.47
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	50	75	30 J	<1.7	<0.53	<1.4
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	50	84	30 J	<0.75	<1.1	<1.2
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	50	28 J	11 J	<0.87	<0.47	<0.47
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	100	1900	850	<12	<4	<4.6
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	100	61 J	<24	<0.9	<1.9	<1.8
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	-	860 J	290 J	5 J	<0.76	<0.65
Total tetrachlorodibenzofuran (TCDF)	pg/L	-	4200 J	1400 J	13 J	1.6 J	0.93 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	-	9.4 J	4.2 J	<0.92	<1	<1.2
Total pentachlorodibenzofuran (PeCDF)	pg/L	-	250 J	91 J	<0.56	<0.69	<0.66
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	-	27 J	7.5 J	2.7 J	2.5 J	4.6 J
Total hexachlorodibenzofuran (HxCDF)	pg/L	-	310 J	110 J	1.8 J	2.9 J	3.2 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	-	190 J	78 J	3.9 J	<0.53	2.3 J
Total heptachlorodibenzofuran (HpCDF)	pg/L	-	140 J	52 J	1.6 J	1.1 J	1.2 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)*	pg/L	-	1109.56	374.34	0	0	0
General Chemistry							
Amount of Solids Removed By Filtering	mg/L	9.53	1355	2744	342	3.27	0.05

Notes:

[1] Per an EPA e-mail dated February 18, 2020, compliance with the Texas Surface Water Quality Standards will be determined using the minimum level of the EPA approved method (1613B), cited in 40 CFR Part 136, in sampling of dioxin concentrations for surface water discharges during the site remedial action.

*The reported value of zero (0) is based on the following conditions: 1) the analytical method used had a method detection level as sensitive as the ML and 2) the analytical results contained no detectable levels above the specified ML. This methodology is consistent with current Texas Pollutant Discharge Elimination System permit requirements.

< indicates that the result is less than the associated value.

J - Estimated concentration.

pg/L - picograms per Liter

mg/L - milligrams per Liter

Table 8

Applicable or Relevant and Appropriate Requirements (ARAR)
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Media/Topic	Status, Regulations, Standards, or Requirements	Citations or References	Description	Comment
Surface Water	Clean Water Act (CWA): Criteria and standards for imposing technology- based treatment requirements under § 402	33 U.S.C. § 1342; 40 CFR Part 125 Subpart A	Both on-site and off-site discharges from CERCLA sites to surface waters are required to meet the substantive CWA (National Pollutant Discharge Elimination System) NPDES requirements (USEPA 1988).	On-site discharges to surface water must comply with the substantive technical requirements of the CWA but do not require a permit (USEPA 1988). Off-site discharges to a Publicly Owned Treatment Work (POTW) would be regulated under the conditions of a NPDES permit (USEPA 1988). Water that is generated during removal activities in the Southern Impoundment will be treated and discharged to the San Jacinto River (Segment 1005), unless a determination is made later in the design process to connect to a POTW. The discharge location will be onsite, so only the substantive requirements of an NPDES permit, but not an NPDES permit, will be required. Water quality-based effluent limitations using TexTox menu # 5 for bay or wide tidal river were calculated and considered for the water treatment design. Development of the treatment system discharge limits are discussed further below.
Surface Water	CWA: Sections 303 and 304: Federal Water Quality Criteria	33 U.S.C. §§1313 and 1314 (304(a) list at date of ROD)	Under §303 (33 U.S.C. §1313), individual states have established water quality standards to protect existing and attainable uses (USEPA 1988). CWA §301(b)(1)(C) requires that pollutants contained in direct discharges be controlled beyond BCT/BAT equivalents (USEPA 1988). CERCLA §121(d)(2)(B)(i) establishes conditions under which water quality criteria, which were developed by USEPA as guidance for states to establish location-specific water quality standards, are to be considered relevant and appropriate. Two kinds of water quality criteria have been developed under CWA §304 (33 U.S.C. §1314): one for protection of human health, and another for protection of aquatic life. These requirements include establishment of total maximum daily loads (TMDL).	Per the 2020 Texas Integrated Report - Texas 303(d) list, San Jacinto River Segment 1005 is classified as impaired body of water for dioxin and PCBs in edible tissues as category 5; therefore It is suitable for development of a TMDL. A TMDL for dioxin and PCBs in edible tissues for San Jacinto River Segment 1005 has not been developed yet. The Texas Surface Water Quality Standard (TSWQS) for dioxins is applicable for surface water discharge from the Southern Impoundment, in accordance with EPA's February 18, 2020, which states that: *"EPA has determined that compliance with the TSWQS ARAR will be attained as follows:* *- The state surface water quality standard for Dioxins/Furans is 7.97 x 10-8 µg/L [0.0797 pg/L] (as TCDD equivalents);* *- Compliance with the TSWQS will be determined by using minimum level of the EPA approved method (1613B), cited in 40 CFR Part 136 (GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS), in sampling of surface water discharges during the site remedial action.* *- If an effluent sample analyzed for dioxin is below the minimum level using the EPA approved method, the sample result would be identified as non-detect and the discharge would be determined to be in compliance with the ARAR.* *This approach is consistent with the state's guidance and other permits issued by TCEQ. EPA's determination is contingent on the water treatment facility using a 1 micron final filtration step in the water treatment process."*
Surface Water	Clean Water Act (CWA): Section 307(b): Pretreatment standards	33 U.S.C. §1317(b)	CERCLA §121(e) states that no Federal, state, or local permit for direct discharges is required for the portion of any removal or remedial action conducted entirely on-site (the aerial extent of contamination and all suitable areas in close proximity to the contamination necessary for implementation of the response action) (USEPA 1988).	If off-site discharges from a CERCLA response activity were to enter receiving waters directly or indirectly, through treatment at a POTW, they must comply with applicable Federal, State, and Local substantive requirements and formal administrative permitting requirements (USEPA 1988). If a determination is made to discharge to a POTW, the offsite discharges to a POTW will need to comply with pretreatment effluent standards and will require a pretreatment permit.
Surface Water	Clean Water Act (CWA)	Section 401: Water Quality Certification 33 U.S.C. §1341 30 TAC Chapter 279	Requires applicants to apply for federal permits for projects that involve a discharge into navigable waters of the U.S. to obtain certification from state or regional regulatory agencies that the proposed discharge will comply with CWA Sections 301, 302, 303, 306, and 307.	Water Quality Certification is a requirement of projects that involve discharge of dredge fill or would impact waters of the U.S. or wetland. This requirement is therefore not applicable for the Southern Impoundment.
Surface Water	Clean Water Act (CWA)	CWA Section 404 and 404(b)(1): Dredge and Fill 33 U.S.C. §1344 (b)(1); 33 CFR 320 and 330; 40 CFR 230)	Discharges of dredged and fill material into waters of the U.S. must comply with the CWA §404 (33 U.S.C. 1344) guidelines and demonstrate the public interest is served (USEPA 1988).	These regulations would not apply because there are not any dredge and fill activities planned for the Southern Impoundment.
Surface Water	Storm Water Discharge from Construction Activities	40 CFR 450 30 TAC Chapter 205	Requires new construction project that will disturb 5 or more acres to request coverage under a Texas Commission on Environmental Quality (TCEQ) construction general permit (TX15000) and develop a storm water pollution prevention plan (SW3) to control discharges of storm water associated with construction activities in accordance with the NPDES program.	The work must comply with the substantive technical requirements of these regulations. A Storm Water Pollution Prevention Plan (SWPPP) will be developed and implemented using best management practices (BMPs) to minimize erosion and entrainment of sediments in stormwater runoff.
Surface Water	Texas Surface Water Quality Standards	30 TAC §307.4-7, 10	These state regulations provide: • General narrative criteria • Anti-degradation Policy • Numerical criteria for pollutants • Numerical and narrative criteria for water-quality related uses (e.g., human use) • Site specific criteria for San Jacinto basin	The Texas Surface Water Quality Standard (TSWQS) for dioxins is applicable for surface water discharge from the Southern Impoundment and the EPA's February 18, 2020 states as follows: "EPA has determined that compliance with the TSWQS ARAR will be attained as follows: - The state surface water quality standard for Dioxins/Furans is 7.97 x 10-8 µg/L [0.0797 pg/L] (as TCDD equivalents); - Compliance with the TSWQS will be determined by using minimum level of the EPA approved method (1613B), cited in 40 CFR Part 136 (GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS), in sampling of surface water discharges during the site remedial action." - If an effluent sample analyzed for dioxin is below the minimum level using the EPA approved method, the sample result would be identified as non-detect and the discharge would be determined to be in compliance with the ARAR. This approach is consistent with the state's guidance and other permits issued by TCEQ. EPA's determination is contingent on the water treatment facility using a 1 micron final filtration step in the water treatment process."
Surface Water	Texas Water Quality: Pollutant Discharge Elimination System (TPDES)	30 TAC §279.10	These state regulations require storm water discharge permits for either industrial discharge or construction- related discharge. The State of Texas was authorized by USEPA to administer the NPDES program in Texas on September 14, 1998 (Texas Commission on Environmental Quality 2009).	No permit is required for on-site activities. A SWPPP will be developed and implemented using BMPs to minimize erosion and entrainment of sediments in stormwater runoff.
Surface Water	Texas Water Quality: Water Quality Certification	30 TAC §279.10	These state regulations establish procedures and criteria for applying for, processing, and reviewing state certifications under CWA, §401. It is the purpose of this chapter, consistent with the Texas Water Code and the federal CWA, to maintain the chemical, physical, and biological integrity of the state's waters.	Water Quality Certification is a requirement of projects that involve discharge of dredge fill or would impact waters of the U.S. or wetland. This requirement is therefore not applicable for the Southern Impoundment.

Table 8

Applicable or Relevant and Appropriate Requirements (ARAR)
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Media/Topic	Status, Regulations, Standards, or Requirements	Citations or References	Description	Comment
Waste	Resource Conservation And Recovery Act (RCRA): Hazardous Waste Management	42 U.S.C. §§6921 et seq.; 40 CFR Parts 260 – 268	RCRA Subtitle C and its implementing regulations contain the federal requirements for the management of hazardous wastes.	This requirement would apply to certain activities if the waste materials or affected soils contain RCRA listed hazardous waste or exhibit a hazardous waste characteristic The waste management in the Southern Impoundment will be required to comply with these regulations. Based on the results of the pre-design investigation for the remedial design (PDI), the Southern Impoundment waste/soils sampled to date are not listed hazardous waste, do not contain listed hazardous waste above RCRA-thresholds, and are not classified as characteristic hazardous waste.
Waste	Toxic Substances Control Act (TSCA)	15 USC §2601 et. seq.; 40 CFR 761.61 (c)	40 CFR 761.61 provides TSCA cleanup and disposal options for PCB remediation waste, which includes PCB- contaminated soil, sediment, sewage or industrial sludge, and building material. 761.61(c) is the risk-based option for PCB remediation waste.	Total PCB concentrations in the Southern Impoundment are below the regulatory threshold of 50 mg/kg, calculated as specified in 40 CFR 761 that could require management of any waste/soils as a TSCA waste.
Waste	RCRA: General Requirements for Solid Waste Management	42 U.S.C. §§6941 et seq.; 40 CFR 258)	Requirements for construction for municipal solid waste landfills that receive RCRA Subtitle D wastes, including industrial solid waste. Requirements for run- on/run-off control systems, groundwater monitoring systems, surface water requirements, etc.	The Southern Impoundment remedial activities do not involve the construction of a municipal landfill; therefore, this regulation does not apply.
Waste	30 Texas Administrative Code (TAC) Part 1: Industrial Solid Waste and Municipal Hazardous Waste General Terms	30 TAC §§335.1 – 335.15	Substantive requirements for the transportation of industrial solid and hazardous wastes; requirements for the location, design, construction, operation, and closure of solid waste management facilities.	Guidelines to promote the proper collection, handling, storage, processing, and disposal of industrial solid waste or municipal hazardous waste in a manner consistent with the purposes of Texas Health and Safety Code, Chapter 361. These regulations also define the classification of the Industrial Solid Waste from the site. They are applicable and will be followed for waste/soils from the Southern Impoundment that are transported to off-site landfills.
Waste	30 TAC Part 1: Industrial Solid Waste and Municipal Hazardous Waste: Notification	30 TAC Chapter 335 Subchapter P	Requires placement of warning signs in contaminated and hazardous areas if a determination is made by the executive director of the Texas Water Commission a potential hazard to public health and safety exists which will be eliminated or reduced by placing a warning sign on the contaminated property.	It is not expected that warning signs will be necessary based on this regulation. The Southern Impoundment will be protected with appropriate signage and other site controls as defined in the Health and Safety Plan.
Waste	30 TAC Part 1: Industrial Solid Waste and Municipal Hazardous Waste: Generators	30 TAC Chapter 335, Subchapter C	Standards for hazardous waste generators either disposing of waste on-site or shipping off-site with the exception of conditionally exempt small quantity generators. The definition of hazardous involves state and federal standards.	The waste management activities for the Southern Impoundment will be required to comply with these regulations. Based on the results of the PDI, the Southern Impoundment waste/soils sampled to date are not listed hazardous waste, do not contain listed hazardous waste above RCRA-thresholds, and are not classified as characteristic hazardous waste.
Waste	Hazardous Materials Transportation Act	49 U.S.C. §§1801 et seq.; 49 CFR Subchapter C	Establishes standards for packaging, documenting, and transporting hazardous materials.	These requirements will apply to all hazardous material transported to and from the Southern Impoundment work site. Based on the results of the PDI, it is not expected that the waste/soils transported offsite will be classified as hazardous material and these requirements will not apply to them.
Air	Clean Air Act (CAA)	42 U.S.C. §§7401 et seq.	Authorization of potential emissions of dust, VOCs, and/or HAP resulting from the excavation and solidification and stabilization of the soil in the Southern Impoundment.	Any air discharges must comply with the substantive technical requirements of the CAA. As the material handling and equipment details are determined during the design, emissions calculations will be performed to define any applicable requirements.
Air	Texas Air Quality Rules	30 TAC Chapter 116	Authorization of potential emissions of dust, VOCs, and/or HAP resulting from the excavation and solidification and stabilization of the soil in the Southern Impoundment.	TCEQ is the designed authority to issue air permit in Texas, so discharges must comply with the substantive technical requirements of this regulation. As the material handling and equipment details are determined during the design, emissions calculations will be performed to define the requirements.
Dredging/Floodplain	Rivers And Harbors Act of 1899: Obstruction of navigable waters (generally, wharves; piers, etc.); excavation and fill	33 U.S.C. §401	Controls the alteration of navigable waters (i.e., waters subject to ebb and flow of the tide shoreward to the mean high water mark). Activities controlled include construction of structures such as piers, berms, and installation of pilings as well as excavation and fill. Section 10 may be applicable for any action that may obstruct or alter a navigable waterway. No permit is required for on-site activities . However, substantive requirements might limit in-water construction activities.	Activities in the Southern Impoundment are not expected to alter navigable waters; therefore, this regulation does not apply.
Dredging/Floodplain	Coastal Zone Management Act	16 USC §§1451 et seq.; 15 CFR 930	Federal activities must be consistent with, to the maximum extent practicable, state coastal zone management programs. Federal agencies must supply the state with a consistency determination (USEPA 1989).	The San Jacinto River lies within the Coastal Zone Boundary according to the Texas Coastal Management Plan (TCMP) prepared by the General Land Office (GLO). The EPA is required to determine whether the Southern Impoundment remedial activities will be consistent with the state's CZMP (USEPA 1989).
Dredging/Floodplain	FEMA (Federal Emergency Management Agency), Department of Homeland Security (Operating Regulations)	42 U.S.C. 4001 et seq.; 44 CFR Chapter 1)	Prohibits alterations to river or floodplains that may increase potential for flooding.	The FEMA flood insurance rate map ID 48201C074M, effective on 1/6/2017, indicates that the Southern Impoundment is located within a designed coastal zone (Zone VE) and a special flood hazard area or 1% annual chance of flooding (Zone AE). This requirement will be incorporated into the design so that the floodplain is not altered.
Dredging/Floodplain	National Flood Insurance Program (NFIP) Regulations	42 U.S.C. subchapter III, §§4101 et seq.	Provides federal flood insurance to local authorities and requires that the local authorities not allow fill in the river that would cause an increase in water levels associated with floods.	Floodplain will not be altered during the implementation of the Southern Impoundment remedy.
Dredging/Floodplain	Floodplain Management and Wetlands Protection	Executive Orders (EO) 11988 and 11990	Requires federal agencies to conduct their activities to avoid, if possible, adverse impacts associated with the destruction or modification of wetlands and occupation or modification of floodplains. Executive Orders 11988 and 11990 require federal projects to avoid adverse effects and minimize potential harm to wetlands and within flood plains. The EO 11990 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative (USEPA 1994).	A wetlands survey has been performed and no wetlands have been identified within the Southern Impoundment. Also, floodplain is not expected to be altered during the implementation of the Southern Impoundment remedy.
Dredging/Floodplain	Texas Coastal Coordination Council Policies for Development in Critical Areas	31 TAC §501.23	Dredging in critical areas is prohibited if activities have adverse effects or degradation on shellfish and/or jeopardize the continued existence of endangered species or results in an adverse effect on a coastal natural resource area (CNRA)5; prohibit the location of facilities in coastal natural resource areas unless adverse effects are prevented and/or no practicable alternative. Specifies compensatory mitigation.	Dredging is not planned for the Southern Impoundment; therefore, this regulation does not apply

Table 8

Applicable or Relevant and Appropriate Requirements (ARAR)
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San Jacinto River Waste Pits Site
Harris County, Texas

Media/Topic	Status, Regulations, Standards, or Requirements	Citations or References	Description	Comment
Dredging/Floodplain	Texas Coastal Management Plan (CMP) Consistency	31 TAC, §506.12	Specifies federal actions within the CMP boundary that may adversely affect CNRAs; specifically selection of remedial actions.	The San Jacinto River lies within the Coastal Zone Boundary (GLO TCMP). During the RI/FS, an evaluation was made as to whether remedial alternatives may affect (adversely or not) the coastal zone and provides a technical basis for the lead agency to determine whether the activity will be consistent with the state's CMP. These requirements will be incorporated into the design as applicable.
Dredging/Floodplain	Texas State Code – obstructions to navigation	Natural Resources Code § 51.302 Prohibition and Penalty	Prohibits construction or maintenance of any structure or facility on land owned by the state without an easement, lease, permit, or other instrument from the state.	Dredging is not planned for the Southern Impoundment; therefore, this regulation does not apply
Dredging/Floodplain	Floodplain Management of Harris County, Texas	Texas Code Section 240.901 and TTC Sections 251.001-251.059 and Sections 254.001-254.019	Establishes construction requirements along the segment of the San Jacinto River at or near the Southern Impoundment.	The FEMA flood insurance rate map ID 48201C074M, effective on 1/6/2017, indicates that the Southern Impoundment is located within a designated coastal zone (Zone VE) and a special flood hazard area or 1% annual chance of flooding (Zone AE). Design of any temporary structure, including gas or liquid storage tanks, will comply with Harris County Texas floodplain management requirements.
Wildlife Protection	Endangered Species Act	16 U.S.C. §§ 1531 et seq.	Federal agencies must ensure that actions they authorize, fund, or carry out are not likely to adversely modify or destroy critical habitat of endangered or threatened species. Actions authorized, funded, or carried out by federal agencies may not jeopardize the continued existence of endangered or threatened species as well as adversely modify or destroy their critical habitats.	Based on a 2010 evaluation, as well as a desktop review of photographs and USFWS and NMFS species and habitat maps, no federally listed threatened or endangered (T&E) species or their critical habitat are present on the Southern Impoundment or utilize areas in the vicinity of the Southern Impoundment.
Wildlife Protection	Fish and Wildlife Coordination Act	16 U.S.C. §§661 et seq., 16 U.S.C. §742a, 16 U.S.C. § 2901	Requires adequate provision for protection of fish and wildlife resources. This title has been expanded to include requests for consultation with USFWS for water resources development projects (Mueller 1980). Any modifications to rivers and channels require consultation with the USFWS, Department of Interior, and state wildlife resources agency. Project-related losses (including discharge of pollutants to water bodies) may require mitigation or compensation.	The remedy for the Southern Impoundment will not alter any river or channel; therefore, mitigation or compensation would not be required.
Wildlife Protection	Bald and Golden Eagle Protection Act	16 U.S.C. §668a-d	Makes it unlawful to take, import, export, possess, buy, sell, purchase, or barter any bald or golden eagle, nest, or egg. “Take” is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping and collecting, molesting, or disturbing.	No readily available information suggests bald or golden eagles frequent the Southern Impoundment; however, If bald or golden eagles are identified prior to or during construction, activities will be designed to conserve the species and their habitat.
Wildlife Protection	Migratory Bird Treaty Act	16 U.S.C. §§703-712; 50 CFR §10.12	Makes it unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. “Take” is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, and trapping and collecting.	The Southern Impoundment remedy will be carried out in a manner to avoid adversely affecting migratory bird species, including individual birds or their nests.
Wildlife Protection	State of Texas Threatened and Endangered (T&E) Species Regulations	31 TAC 65.171 - 65.176	No person may take, possess, propagate, transport, export, sell or offer for sale, or ship any species of fish or wildlife listed as threatened or endangered.	Based on a 2010 evaluation, as well as a desktop review of photographs and USFWS and NMFS species and habitat maps, no state listed T&E species or their critical habitat are present on the Southern Impoundment or utilize areas in the vicinity of the Southern Impoundment.
Historic Preservation	National Historic Preservation Act	16 U.S.C. §§ 470 et seq.; 36 CFR 800	Section 106 of this statute requires federal agencies to consider effects of their undertakings on historic properties. Historic properties may include any district, site, building, structure, or object included in or eligible for the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property.	According to the San Jacinto River Waste Pits Remedial Investigation/Feasibility Study (RI/FS) cultural resources assessment, “no NRHP-eligible properties are documented in the area of concern. Because of the extensive disturbance to the site and minimal ground disturbance that will likely occur for the project, it is not likely that NRHP eligible historic properties will be affected by RI/FS or eventual site remediation activities” (Anchor QEA 2009). This requirement is therefore not applicable.
Historic Preservation	Natural Resources Code, Antiquities Code of Texas	Texas Parks and Wildlife Commission Regulations 191.092-171	Requires that the Texas Historical Commission staff review any action that has the potential to disturb historic and archeological sites on public land. Actions that need review include any construction program that takes place on land owned or controlled by a state agency or a state political subdivision, such as a city or a county. Without local control, this requirement does not apply.	Assessment of historical resources during the RI/FS produced no known eligible properties and determined that disturbance of any archaeological or historic resources is unlikely within the Southern Impoundment. This requirement is therefore not expected to be applicable.
Historic Preservation	Practice and Procedure, Administrative Code of Texas	13 TAC Part 2, Chapter 26	Regulations implementing the Antiquities Code of Texas. Describes criteria for evaluating archaeological sites and permit requirements for archaeological excavation.	This requirement is only applicable if an archaeological site is found; based on evaluations during the RI/FS, it is unlikely that archaeological resources would be found on the Southern Impoundment. This requirement is therefore not expected to be applicable.
Noise	Noise Control Act	42 U.S.C. §§ 4901 et seq.; 40 CFR Subchapter G §201 et seq.	Noise Control Act remains in effect but unfunded (USEPA 2010).	Noise is regulated at the state level.
Noise	Noise Regulations	Texas Penal Code Chapter 42, Section 42.01	The Texas Penal Code regulates any noise that exceeds 85 decibels after the noise is identified as a public nuisance.	A noise is presumed to be unreasonable if the noise exceeds a decibel level of 85 after the person making the noise receives notice from a magistrate or peace officer that the noise is a public nuisance. An offense under this section is a Class C misdemeanor. Most activities are likely to not exceed the 85 decibel level beyond the immediate work area. With the exception of pile driving for the bulkhead, the activities are not anticipated to constitute a public nuisance due to the isolation of the work, its location adjacent to a freeway with high volumes of traffic during normal working hours, and the industrial nature of activities on the Southern impoundment. Pile driving would be limited to normal working hours, to the extent possible, to minimize impacts.

Table 9

Site Specific Soil Parameters
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Designation	Elevation (feet)	Density (pcf)	Friction Angle (degree)	Undrained Shear Strength (psf)
SP – Poorly Graded Sand	Ground Level to -7	117	30	
CH – High Plasticity Clay	-7 to -16	95		700
SP – Poorly Graded Sand	-16 to -25	120	30	
SP – Poorly Graded Sand	-25 to -38	122	32	
CH – High Plasticity Clay	-38 and below	95		1750

Notes:
pcf - Pounds per cubic foot
psf - Pounds per square foot

Table 10

Southern Impoundment Water Treatment Basis of Sizing
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Equipment/Process Description	Sizing/Selection Criteria Assumptions	Preliminary Design Value	Notes
Remediation Cell Dewatering Pump	Design Storm Event (100-yr)	Accommodate Flows up to 600 GPM	Trash pump
Mixed Holding Tanks	Containment of 100yr Event (Total Volume)	80,000 gallons	Provided in up to six (6) 18,500 gallons mixed holding tanks with top entry mixers to accommodate contact water/return stream equalization
Treatment Feed Pump	300 GPM base treatment flow	Up to 500 GPM to accommodate return streams	Pump will operate on VFD to adjust treatment rate as required
Rapid Mix Tank	Approximate retention time: 30 seconds	400 gallon capacity	Tank will include baffles to prevent vortexing. Tank will be mixed by top entry mixer with paddle-type blades to prevent shearing solids
Flocculation Tank	Nominal retention time: 20 minutes	15,500 gallon capacity	Tank will include baffles to prevent vortexing. Tank will be mixed by top entry mixer(s) with paddle-type blades to prevent shearing solids. Mixer shall be variable speed.
Inclined Plate Clarifier	Hydraulic Loading rate: 0.25 GPM/ft^2	200 ft^2 of inclined plate separation area	Clarifier shall include integral sludge hopper to allow for chemical sludge withdrawal
Filter Feed Tank	Nominal retention time of 20 minutes	6,000 gallon capacity	Tank will include baffles to prevent vortexing. Tank will be mixed by top entry mixer(s) with paddle-type blades to prevent shearing solids
Filter Feed Pump	300 GPM base treatment flow	Up to 400 GPM	Pump will be positive displacement type and will operate on VFD
Multimedia Filters	5 GPM/ft^2 Hydraulic Loading	60 ft^2 of active media filter area	Minimum two vessels configured in parallel; sand/anthracite media
Nominal Rated Filters	Nominally Rated Filters @ 10 micron	Nominally rated 10 micron bag filters	Bag Filters configured in multiple bag pressure vessels
Nominal Rated Filters	Nominally Rated Filters @ 1 micron	Nominally rated 1 micron bag filters	Bag Filters configured in multiple bag pressure vessels
Absolute Rated Filters	Absolute rated @ 1 micron	Absolute rated 1 micron cartridge filters	Cartridge Filters configured in multiple cartridge pressure vessels
Granular Activated Carbon	10 minute Empty Bed Contact Time (min) per stage 5 GPM/ft^2 Hydraulic Loading	400 ft^3 Bed Volume; 60 ft^2 of active bed area	GAC vessels will be configured in a lead-lag configuration providing a total contact time up to 20 minutes (total)
Treated Effluent Holding Tank	Sufficient volume for Multimedia filter backwash (10,000 US gallon minimum)	18,500 gallon holding tank	-

Table 10

Southern Impoundment Water Treatment Basis of Sizing
Preliminary 30% Remedial Design - Southern Impoundment
San Jacinto River Waste Pits Site
Harris County, Texas

Equipment/Process Description	Sizing/Selection Criteria Assumptions	Preliminary Design Value	Notes
Treated Effluent Discharge Pumps	300 GPM base treatment flow	Up to 500 GPM to accommodate process fluctuations	Pump will operate on VFD to adjust discharge rate as required
Clean Water Backwash Pumps	Backwashing of Multimedia filters; 12 GPM/ft^2	Up to 750 GPM	Pump will operate on VFD to adjust backwash rate as required
Sludge Wasting/Recycle Pump	Sludge Recycle Ratio of 0.75	Sludge Recycle Flow – Up to 400 GPM Sludge Wasting Flow – Up to 150 GPM Total Sludge Flow – up to 550 GPM	Sludge Wasting/Recycle pump will be positive displacement type; sludge wasting/recycle regulated by actuated waste
Gravity Sludge Thickener	16 lbs/ft^2 day solids Loading	900 ft^2 of thickener surface area	Thickener shall allow for decanting operation and removal of thickened sludge
Thickener Decant Return Pump	85% volume (liquid) removal in thickener	Up to 150 GPM Flow	Pump will operate on VFD to adjust decant return flow
Thickened Sludge Wasting Pump	Assume 15% volume as Thickened sludge in Thickener	Up to 50 GPM	Thickened sludge pump will be positive displacement type; Pump will operate on VFD to adjust decant return flow
Thickened Sludge Holding Tank	Sludge generated during 100-yr storm event	1000 gallons (minimum)	-
Coagulant Feed Pumps	Flow paced at dosage of 50 ppm coagulant solution	Up to 2 GPH	Peristaltic type chemical metering pumps
Organosulfide Feed Pumps	Flow paced at dose of 50 ppm organosulfide solution	Up to 2 GPH	Peristaltic type chemical metering pumps
Acid/Caustic Feed Pumps	Flow paced based on measured pH of contact water	Up to 2 GPH	Chemical metering pumps
Polymer Feed Pumps	Flow paced at dose of 500 ppm (neat polymer)	Up to 15 GPH (dilute polymer solution)	Peristaltic type chemical metering pumps; polymer activation/aging equipment will be provided as needed

Notes:
The 30% process flow diagram (drawing P-01) and piping and instrumentation diagrams (drawings P-02 and P-03) illustrate the major water treatment system equipment and components.
GPM - Gallons per minute
VFD - Variable frequency drive
ft^2 - Square feet
ft^3 - Cubic feet
ppm - Parts per million
GPH - Gallons per hour

Appendices

Appendix A
Pre-Design Investigation Supporting Documents

Appendix A - Index

Appendices

Appendix A-1
First Phase Pre-Design Investigation Laboratory Reports

Appendix A-2
First Phase Pre-Design Investigation Data Validation Report

DATA VALIDATION REPORT

SAN JACINTO RIVER WASTE PITS
SOUTH IMPOUNDMENT SAMPLING

Prepared for:

Integral Consulting, Inc.
1205 West Bay Dr. NW
Olympia, Washington 98502

Prepared by:

EcoChem, Inc.
500 Union Street, Suite 1010
Seattle, Washington 98101

EcoChem Project: C22130-29

February 20, 2019

Approved for Release:

Christina Mott Frans
Senior Project Chemist
EcoChem, Inc.

PROJECT NARRATIVE

Basis for Data Validation

This report summarizes the results of summary and full validation (EPA Stage 4 and Stage 2B) performed on sediment sample data for the San Jacinto South Impoundment Sampling. A complete list of samples is provided in the Sample Index.

Samples were analyzed by ALS Environmental, Houston, Texas, ALS Environmental, Kelso, Washington, and ALS Environmental, Holland, Michigan. The analytical methods and EcoChem project chemists are listed below.

<table>
<tr><th>ANALYSIS</th><th>METHOD</th><th>PRIMARY REVIEW</th><th>SECONDARY REVIEW</th></tr>
<tr><td>Dioxin/Furan Compounds</td><td>EPA 1613B</td><td>C. Ransom &
E. Clayton</td><td>C. Frans &
C. Ransom</td></tr>
<tr><td>TCLP Volatile Organic Compounds</td><td>SW 1311/8260C</td><td rowspan="14">E. Clayton</td><td rowspan="14">C. Ransom</td></tr>
<tr><td>TCLP Semivolatile Organic Compounds</td><td>SW 1311/8270D</td></tr>
<tr><td>TCLP Organochlorine Pesticide Compounds</td><td>SW 1311/8081B</td></tr>
<tr><td>PCB Aroclors</td><td>SW 8280</td></tr>
<tr><td>TCLP Herbicides Compounds</td><td>SW 1311/8151A</td></tr>
<tr><td>Gasoline Range Organics</td><td>SW 8015C</td></tr>
<tr><td>Diesel & Residual Range Organics</td><td>TX 1005 & SW 8015C</td></tr>
<tr><td>TCLP Metals</td><td>SW6010C/7470A</td></tr>
<tr><td>Reactive Sulfide</td><td>SW 9034M</td></tr>
<tr><td>Flash Point</td><td>SW 1020A</td></tr>
<tr><td>pH</td><td>SW 9045D</td></tr>
<tr><td>Reactive Cyanide</td><td>SW 7.3.3.2</td></tr>
<tr><td>Sulfate</td><td>EPA 300.0</td></tr>
<tr><td>Sulfur</td><td>SW 9056A mod</td></tr>
</table>

The data were reviewed using guidance and quality control criteria documented in the analytical methods and the following project and guidance documents:

- *Pre-Design Investigation Quality Assurance Project Plan San Jacinto River Waste Pits Superfund Site* (Integral/Anchor QEA, August 2018).
- *USEPA National Functional Guidelines for Organic Data Review* (USEPA 2008 & 2014).
- *USEPA National Functional Guidelines for Inorganic Data Review* (USEPA 2010).
- *USEPA National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2011).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as APPENDIX A. A Qualified Data Summary Table is included in APPENDIX B. Data Validation Worksheets and project associated communications will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index

San Jacinto Waste Pits

South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801012	SL0058	E1801012-006	✓	✓														
	SL0064	E1801012-012	✓	✓														
	SL0071	E1801012-018	✓	✓														
	SL0065	E1801012-019	✓	✓														
	SL0072	E1801012-020	✓	✓														
	FW0002	E1801012-021	✓	✓														
	FW0003	E1801012-022	✓	✓														
E1801020	SL0045	E1801020-006	✓	✓														
	SL0052	E1801020-012	✓	✓														
	SL0022	E1801020-018	✓	✓														
	SL0011	E1801020-034	✓	✓														
	SL0033	E1801020-045	✓	✓														
	SL0034	E1801020-051	✓	✓														
	SL0046	E1801020-052	✓	✓														
	FW0001	E1801020-053	✓	✓														
	FB0001	E1801020-054	✓	✓														
HS18110317	SL0022	HS189110317-01			✓	✓												
E1801035	SL0084	E1801035-006	✓	✓														
	SL0078	E1801035-017	✓	✓														
E1801039	SL0100	E1801039-006	✓	✓														
	SL0107	E1801039-017	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801039	SL0108	E1801039-031	✓	✓														
	SL0129	E1801039-036	✓	✓														
	SL0130	E1801039-037	✓	✓														
	SL0101	E1801039-038	✓	✓														
	FW0005	E1801039-039	✓	✓														
	FW0006	E1801039-040	✓	✓														
	FW0004	E1801039-041	✓	✓														
	Comp-SL0119-0123	E1801039-042	✓	✓														
E1801045	SL0153	E1801045-006	✓	✓														
	SL0164	E1801045-017	✓	✓														
	SL0146	E1801045-023	✓	✓														
E1801056	SL0191	E1801056-006	✓	✓														
	SL0197	E1801056-012	✓	✓														
	SL0175	E1801056-023	✓	✓														
	SL0203	E1801056-039	✓	✓														
	SL0204	E1801056-040	✓	✓														
	SL0221	E1801056-057	✓	✓														
	SL0227	E1801056-063	✓	✓														
	FW0007	E1801056-069	✓	✓														
E1801058	SL0243	E1801058-011	✓	✓														
	SL0249	E1801058-017	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801058	SL0250	E1801058-018	✓	✓														
	SL0256	E1801058-024	✓	✓														
	FW0008	E1801058-030	✓	✓														
	FW0009	E1801058-031	✓	✓														
	FW0010	E1801058-032	✓	✓														
E1801093	SL0017	E1801093-001	✓	✓														
	SL0018	E1801093-002	✓	✓														
	SL0019	E1801093-003	✓	✓														
	SL0020	E1801093-004	✓	✓														
	SL0021	E1801093-005	✓	✓														
	SL0023	E1801093-006	✓	✓														
	SL0024	E1801093-007	✓	✓														
	SL0025	E1801093-008	✓	✓														
	SL0026	E1801093-009	✓	✓														
	SL0027	E1801093-010	✓	✓														
	SL0006	E1801093-011	✓	✓														
	SL0007	E1801093-012	✓	✓														
	SL0008	E1801093-013	✓	✓														
	SL0009	E1801093-014	✓	✓														
	SL0010	E1801093-015	✓	✓														
	SL0001	E1801093-016	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801093	SL0002	E1801093-017	✓	✓														
	SL0003	E1801093-018	✓	✓														
	SL0004	E1801093-019	✓	✓														
	SL0005	E1801093-020	✓	✓														
E1801094	SL0028	E1801094-001	✓	✓														
	SL0029	E1801094-002	✓	✓														
	SL0030	E1801094-003	✓	✓														
	SL0031	E1801094-004	✓	✓														
	SL0032	E1801094-005	✓	✓														
	SL0035	E1801094-006	✓	✓														
	SL0036	E1801094-007	✓	✓														
	SL0037	E1801094-008	✓	✓														
	SL0038	E1801094-009	✓	✓														
	SL0039	E1801094-010	✓	✓														
	SL0053	E1801094-011	✓	✓														
	SL0054	E1801094-012	✓	✓														
	SL0055	E1801094-013	✓	✓														
	SL0056	E1801094-014	✓	✓														
	SL0057	E1801094-015	✓	✓														
	SL0012	E1801094-016	✓	✓														
	SL0013	E1801094-017	✓	✓														

Sample Index
San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801094	SL0014	E1801094-018	✓	✓														
	SL0015	E1801094-019	✓	✓														
	SL0016	E1801094-020	✓	✓														
E1801096	SL0059	E1801096-001	✓	✓														
	SL0060	E1801096-002	✓	✓														
	SL0061	E1801096-003	✓	✓														
	SL0062	E1801096-004	✓	✓														
	SL0063	E1801096-005	✓	✓														
	SL0206	E1801096-006	✓	✓														
	SL0207	E1801096-007	✓	✓														
	SL0208	E1801096-008	✓	✓														
	SL0209	E1801096-009	✓	✓														
	SL0210	E1801096-010	✓	✓														
	SL0066	E1801096-011	✓	✓														
	SL0067	E1801096-012	✓	✓														
	SL0068	E1801096-013	✓	✓														
	SL0069	E1801096-014	✓	✓														
	SL0070	E1801096-015	✓	✓														
	SL0233	E1801096-016	✓	✓														
	SL0234	E1801096-017	✓	✓														
	SL0235	E1801096-018	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801096	SL0236	E1801096-019	✓	✓														
	SL0237	E1801096-020	✓	✓														
E1801136	SL0079	E1801136-001	✓	✓														
	SL0080	E1801136-002	✓	✓														
	SL0081	E1801136-003	✓	✓														
	SL0082	E1801136-004	✓	✓														
	SL0083	E1801136-005	✓	✓														
	SL0085	E1801136-006	✓	✓														
	SL0086	E1801136-007	✓	✓														
	SL0087	E1801136-008	✓	✓														
	SL0088	E1801136-009	✓	✓														
	SL0089	E1801136-010	✓	✓														
	SL0116	E1801136-011	✓	✓														
	SL0117	E1801136-012	✓	✓														
	SL0118	E1801136-013	✓	✓														
	SL0124	E1801136-014	✓	✓														
	SL0126	E1801136-015	✓	✓														
	SL0127	E1801136-016	✓	✓														
	SL0128	E1801136-017	✓	✓														
	SL0141	E1801136-018	✓	✓														
	SL0142	E1801136-019	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801136	SL0143	E1801136-020	✓	✓														
E1801137	SL0144	E1801137-001	✓	✓														
	SL0145	E1801137-002	✓	✓														
	SL0136	E1801137-003	✓	✓														
	SL0137	E1801137-004	✓	✓														
	SL0138	E1801137-005	✓	✓														
	SL0139	E1801137-006	✓	✓														
	SL0140	E1801137-007	✓	✓														
	SL0131	E1801137-008	✓	✓														
	SL0132	E1801137-009	✓	✓														
	SL0133	E1801137-010	✓	✓														
	SL0134	E1801137-011	✓	✓														
	SL0135	E1801137-012	✓	✓														
	SL0186	E1801137-013	✓	✓														
	SL0187	E1801137-014	✓	✓														
	SL0188	E1801137-015	✓	✓														
	SL0189	E1801137-016	✓	✓														
	SL0190	E1801137-017	✓	✓														
	SL0192	E1801137-018	✓	✓														
	SL0193	E1801137-019	✓	✓														
	SL0194	E1801137-020	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801138	SL0195	E1801138-001	✓	✓														
	SL0196	E1801138-002	✓	✓														
	SL0170	E1801138-003	✓	✓														
	SL0171	E1801138-004	✓	✓														
	SL0172	E1801138-005	✓	✓														
	SL0173	E1801138-006	✓	✓														
	SL0174	E1801138-007	✓	✓														
	SL0176	E1801138-008	✓	✓														
	SL0177	E1801138-009	✓	✓														
	SL0178	E1801138-010	✓	✓														
	SL0179	E1801138-011	✓	✓														
	SL0180	E1801138-012	✓	✓														
	SL0198	E1801138-013	✓	✓														
	SL0199	E1801138-014	✓	✓														
	SL0200	E1801138-015	✓	✓														
	SL0201	E1801138-016	✓	✓														
	SL0202	E1801138-017	✓	✓														
	SL0211	E1801138-018	✓	✓														
	SL0212	E1801138-019	✓	✓														
	SL0213	E1801138-020	✓	✓														
E1801139	SL0214	E1801139-001	✓	✓														

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San Jacinto Waste Pits

South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
E1801139	SL0215	E1801139-002	✓	✓														
	SL0216	E1801139-003	✓	✓														
	SL0217	E1801139-004	✓	✓														
	SL0218	E1801139-005	✓	✓														
	SL0219	E1801139-006	✓	✓														
	SL0220	E1801139-007	✓	✓														
	SL0222	E1801139-008	✓	✓														
	SL0223	E1801139-009	✓	✓														
	SL0224	E1801139-010	✓	✓														
	SL0225	E1801139-011	✓	✓														
	SL0226	E1801139-012	✓	✓														
	SL0228	E1801139-013	✓	✓														
	SL0229	E1801139-014	✓	✓														
	SL0230	E1801139-015	✓	✓														
	SL0231	E1801139-016	✓	✓														
	SL0232	E1801139-017	✓	✓														
	SL0244	E1801139-018	✓	✓														
	SL0245	E1801139-019	✓	✓														
	SL0246	E1801139-020	✓	✓														
	SL0247	E1801139-021	✓	✓														
	SL0248	E1801139-022	✓	✓														

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San Jacinto Waste Pits
South Impoundments

SDG	SAMPLE ID	LABORATORY ID	Dioxins/Furans	Solids	GRO	DRO/RRO	TCLP VOCs	TCLP SVOCs	TCLP OCPs	PCB Aroclors	TCLP Herbicides	TCLP Metals	Reactive Cyanide	Reactive Sulfide	Sulfate	Sulfur	pH	Flash Point
K1811120	SL0084	K1811120-001		✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
	SL0064	K1811120-002		✓		✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
	SL0065	K1811120-003		✓		✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
	SL0022	K1811120-004		✓			✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
	FW0001	K1811120-005								✓				✓	✓	✓	✓	✓
	FB0001	K1811120-006								✓				✓	✓	✓	✓	✓
	SL0064	K1811120-007			✓													
	SL0065	K1811120-008			✓													
	SL0084	1901287-01											✓					
	SL0064	1901287-02											✓					
	SL0065	1901287-03											✓					
	SL0022	1901287-04											✓					
	FW0001	1901287-05											✓					
	FB0001	1901287-06											✓					
K1811381	SL0205	K1811381-001			✓													
	SL0153	K1811381-004			✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓
	SL0146	K1811381-005			✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓
	SL0153	18111900-01											✓					
	SL0146	18111900-02											✓					

DATA VALIDATION REPORT
San Jacinto South Impoundments
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by ALS Environmental, Houston, Texas. Refer to the Sample Index for a complete list of samples.

SDG	Number of Samples	Validation Level
E1801012	5 Soil, 2 Filter Wipe	EPA Stage 4 & EPA Stage 2B
E1801020	7 Soil, 1 Filter Blank, 1 Filter Wipe	EPA Stage 4
E1801035	2 Soil	EPA Stage 2B
E1801039	7 Soil, 3 Filter Wipe	EPA Stage 2B
E1801045	3 Soil	EPA Stage 4
E1801056	7 Soil, 1 Filter Wipe	EPA Stage 4 & EPA Stage 2B
E1801058	4 Soil, 3 Filter Wipe	EPA Stage 2B
E1801093	20 Soil	EPA Stage 2B
E1801094	20 Soil	EPA Stage 2B
E1801096	20 Soil	EPA Stage 2B
E1801136	20 Soil	EPA Stage 2B
E1801137	20 Soil	EPA Stage 2B
E1801138	20 Soil	EPA Stage 2B
E1801139	22 Soil	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG E1801039: The data package was missing the CCAL for analysis date 12/8/18. The documentation for this CCAL was provided in North Impoundments SDG E1801065. No action was taken.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package.

SDG E1801058: The filter wipes were logged in with incorrect IDs. The sample IDS are FW0008, FW0009, and FW0010 instead of FW008, FW009, and FW010. The database has the correct IDs; no further action was taken.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	1	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
✓	System Performance and Resolution Checks	1	Field Duplicate Samples
✓	Initial Calibration (ICAL)	✓	Target Analyte List
✓	Calibration Verification	✓	Reporting Limits
2	Laboratory Blanks	1	Reported Results
1	Field Blanks	2	Compound Identification
2	Labeled Compound Recovery	2	Compound Quantitation
1	Laboratory Control Samples (LCS/LCSD)	1	Calculation Verification

✓ ***Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.***
1 ***Quality control results are discussed below, but no data were qualified.***
2 ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG E1801012: Sample SL0072 was analyzed, although it was not marked for analysis on the COC. No action was taken.

SDG E1801020: The cooler temperature was less than the lower control limit, at -1.4ºC. Samples were not affected by the temperature outlier; no action was taken.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level was established at five times (5x) the concentration reported in the blank. If a contaminant was reported in an associated field sample and the concentration was less than the action level, the result was qualified as not detected (U-7). No action was taken if the sample result was greater than the action level, or for non-detected results. Analytes reported as an "estimated maximum possible concentration" (EMPC) are considered to be false positives. No action levels were established for these analytes. Total homolog groups were also not evaluated.

Method blanks were analyzed at the appropriate frequency. Several analytes were detected in the method blanks; however, only the following outliers resulted in qualification of data:

Blank ID	Batch	SDG	Analyte	Samples Qualified	Qualifier
EQ1800463-01	326161	E1801012 E1801020 E1801039	1,2,3,7,8,9-HxCDF	SL0045, SL0052	U-7
EQ1800467-01	326300		1,2,3,7,8,9-HxCDD	FW0003	U-7
			OCDF	FW0001, FB0001, FW0003, FW0005	U-7
EQ1800510-01	328121	E1801094	1,2,3,4,6,7,8-HpCDF	SL0037	U-7

Field Blanks

Filter wipes were submitted as field blanks. The filter wipe amounts of total pg were converted to ng/kg in order to compare them to the field sample concentrations. This was done using conversion factors 32 oz (two 16 oz jars collected for each sample), 29.57 cc/oz, and 1.6 g/cc. Any positive results remaining in the filter wipes after method blank evaluation were used to evaluate the potential impact of field contamination on the samples. Action levels were established at 5x the amount reported for the filter wipes. Positive results in the associated samples that were less than the action levels were qualified as not-detected (U-6).

SDG E1801012: Two filter wipes, FW0002 and FW0003, were submitted. Filter wipe FW0002 is associated with all samples collected on 11/5/18. These samples are in SDGs E1801020, E1801094, and E1801096. After qualification based on method blank contamination, positive results remained for 1,2,3,6,7,8-HxCDD, 1,2,3,4,6,7,8-HpCDD, OCDD, and OCDF. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

Filter wipe FW0003 is associated with all samples collected on 11/6/18 and 11/7/18. These samples are in SDGs E1801020, E1801035, and E1801096. After qualification based on method blank contamination, positive results remained for 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, and OCDD. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

SDG E1801020: One filter blank, FB0001, was submitted. This filter blank is associated with all filter wipe samples. After qualification based on method blank contamination, positive results remained for 1,2,3,4,6,7,8-HxCDF and OCDD. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

One filter wipe, FW0001, was also submitted. This filter wipe is associated with all samples collected on 11/3/18 and 11/4/18. These samples are in SDGs E1801020, E1801093, and E1801094. After qualification based on method blank contamination, positive results remained for 1,2,3,6,7,8-HxCDF, 1,2,3,7,8-PeCDF, and 2,3,4,7,8-PeCDF. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

SDG E1801039: Three filter wipes were submitted: FW0004, FW0005, and FW0006. Filter wipe FW0004 is associated with the sample collected on 11/8/18 in SDG E1801035 and E1801136. After qualification based on method blank contamination, positive results remained for 1,2,3,6,7,8-HxCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDD. All associated sample results were greater than the action levels. No qualification of data was necessary.

Filter wipe FW0005 is associated with all samples collected on 11/10/18. These samples are in SDG E1801039. After qualification based on method blank contamination, a positive result remained for 1,2,3,4,7,8-HxCDF. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

Filter wipe FW0006 is associated with all samples collected on 11/11/18, 11/12/18, and 11/13/18. These samples are in SDGs E1801039, E1801045, E1801136, and E1801137. After qualification based on method blank contamination, positive results remained for 1,2,3,4,7,8-HxCDF and 1,2,3,4,6,7,8-HpCDF. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

SDG E1801056: One filter wipe, FW0007, was submitted. This filter wipe is associated with all samples collected on 11/15/18 in SDGs E1801056 and E1801139. There were no target analytes detected.

SDG E1801058: Three filter wipes were submitted: FW0008, FW0009, and FW0010. These are all associated with samples collected on 11/16/18 in SDGs E1801058, E1801096, and E1801139. After qualification based on method blank contamination, positive results remained for 2,3,7,8-TCDF in FW0008 and 1,2,3,4,6,7,8-HpCDD and OCDD in FW0009. All associated sample results were either greater than the action levels or were not detected. No qualification of data was necessary.

Labeled Compound Recovery

Isotope-stable labeled compounds were added to each field and QC sample. With the following exceptions, the percent recovery (%R) values were within the method acceptance criteria.

SDG	Sample	Labeled Compound Outlier	Bias	Qualifier
E1801035	SL0078	13C-OCDD	Low	J-13L
		13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
E1801039	SL0129	13C-OCDD	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
	SL0130	13C-OCDD	Low	J-13L
		13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
E1801056	SL0197	13C-2,3,7,8-TCDD	Low	J-13L
		13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
E1801058	FW0008	13C-2,3,7,8-TCDD	Low	UJ-13L
E1801093	SL0001	13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
		13C-OCDD	Low	J-13L
E1801094	SL0035	All labeled compounds at or below lower control limit	Low	J/UJ-13L
	SL0038	All labeled compounds at or below lower control limit	Low	J/UJ-13L
	SL0056	13C-OCDD	Low	J-13L
E1801096	SL0237	13C-2,3,7,8-TCDD	Low	J-13L
E1801137	SL0144	13C-OCDD	Low	J-13L
	SL0138	13C-OCDD	Low	J-13L
		13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	UJ-13L

SDG	Sample	Labeled Compound Outlier	Bias	Qualifier
E1801137	SL0139	13C-OCDD	Low	J-13L
		13C-1,2,3,4,6,7,8-HpCDF	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
	SL0140	13C-OCDD	Low	J-13L
		13C-1,2,3,4,7,8,9-HpCDF	Low	J-13L
	SL0190	13C-2378-TCDD	Low	J-13L
		13C-2378-TCDF	Low	J-13L

Laboratory Control Samples

Laboratory control sample/Laboratory control sample duplicate (LCS/LCSD) samples were analyzed at the proper frequency. With the following exceptions, recovery values and RPD values were within the control limits.

SDG E1801094: The LCSD %R value for 2,3,7,8-TCDD was greater than the upper control limit. The LCS %R value was acceptable; no action was taken on this basis.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples are not required by the method and were not analyzed. Accuracy and precision were evaluated using the labeled compound and laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results.

Field Duplicates

The relative percent difference (RPD) control limit is 50% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the difference between the sample and duplicate must be less than 2x the RL.

No qualifiers were applied based on field duplicate precision outliers. However, data users should take field precision into account when interpreting sample data. Field duplicate pairs and any outliers are noted below:

SDG	Field Duplicate Set	Compound	Outlier Type
E1801012	SL0064/SL0065	OCDF	RPD
	SL0071/SL0072	No outliers	
E1801020	SL0045/SL0046	Total TCDD	RPD
	SL0033/SL0034	1,2,3,6,7,8-HxCDD	RPD
		Total HxCDD	RPD
E1801039	SL0100/SL0101	1,2,3,4,6,7,8-HpCDD	Diff>2xRL
		1,2,3,4,6,7,8-HpCDF	RPD
		OCDD	RPD
		OCDF	RPD
		Total HpCDD	RPD

SDG	Field Duplicate Set	Compound	Outlier Type
E1801039	SL0100/SL0101	Total HpCDF	RPD
		Total HxCDD	Diff>2xRL
		Total HxCDF	RPD
	SL0107/SL0108	No outliers	
	SL0129/SL0130	1,2,3,4,7,8,9-HpCDF	Diff>2xRL
		1,2,3,4,7,8-HxCDD	RPD
		1,2,3,6,7,8-HxCDD	RPD
		1,2,3,7,8,9-HxCDD	Diff>2xRL
		1,2,3,7,8-PeCDD	RPD
		1,2,3,7,8-PeCDF	Diff>2xRL
		2,3,4,7,8-PeCDF	RPD
		2,3,7,8-TCDD	RPD
		2,3,7,8-TCDF	RPD
		Total HxCDD	RPD
		Total PeCDD	RPD
		Total TCDD	RPD
		Total TCDF	RPD
E1801056	SL0203/SL0204	1,2,3,4,6,7,8-HpCDD	RPD
		1,2,3,4,6,7,8-HpCDF	RPD
		1,2,3,4,7,8,9-HpCDF	Diff>2xRL
		1,2,3,4,7,8-HxCDF	RPD
		1,2,3,6,7,8-HxCDF	RPD
		1,2,3,7,8,9-HxCDF	Diff>2xRL
		1,2,3,7,8-PeCDD	Diff>2xRL
		1,2,3,7,8-PeCDF	RPD
		2,3,4,7,8-PeCDF	RPD
		OCDD	RPD
		OCDF	RPD
		Total HpCDD	RPD
		Total HpCDF	RPD
		Total PeCDD	Diff>2xRL
		Total PeCDF	RPD
E1801058	SL0249/SL0250		No Outliers

Reported Results

Reporting limits were adjusted for percent solids, starting sample size, and required dilutions. Non-detected results were reported as ND at the reporting limit (RL).

Compound Identification

The laboratory assigned K-flags to results where a peak was detected but did not meet ion ratio quantitation criteria. The reported values cannot be considered as positive identifications for these analytes. These results were considered potential false positives or estimated maximum possible concentrations (EMPC) and were qualified as not detected (U-25) at the reported values.

The method requires the confirmation of 2,3,7,8-TCDF using an alternate GC column as the DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory did not perform a second column confirmation; however, the laboratory uses a DB-5MSUI column. This column provides adequate resolution of the TCDF isomers as indicated by the acceptable peak to valley ratios. Since the 2,3,7,8-TCDF resolution was acceptable, no action was necessary.

Compound Quantitation

SDG E1801012: The results for 1,2,3,6,7,8-HxCDF in Sample SL0058 was flagged "P" indicating chlorodiphenyl ether interference. These result was estimated (J-23).

SDG E1801020: The results for 1,2,3,6,7,8-HxCDF in Sample SL0022 and 1,2,3,7,8-PeCDF in Sample SL0033 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

The results for OCDD in samples SL0045 and SL0046 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

SDG E1801045: The result for OCDD in Sample SL0146 exceeded the calibration range of the instrument and was flagged with an "E". This result was estimated (J-20).

SDG E1801039: The result for 1,2,3,6,7,8-HxCDF in Sample SL0129 was flagged "P" indicating chlorodiphenyl ether interference. This result was estimated (J-23).

SDG E1801093: The results for 1,2,3,6,7,8-HxCDF and 1,2,3,7,8-PeCDF in Sample SL0024 and 1,2,3,4,7,8-HxCDF in Sample SL0026 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

The OCDD results for samples SL0017, SL0018, SL0024, and SL0025 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

SDG E1801094: The results for 1,2,3,6,7,8-HxCDF in samples SL0014, SL0028, SL0035, SL0054, SL0055, and SL0057 and 1,2,3,7,8-PeCDF in Sample SL0029 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

The OCDD results for samples SL0013, SL0028, SL0035, and SL0055 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

SDG E1801096: The results for 1,2,3,6,7,8-HxCDF in samples SL0062, SL0206, SL0233 and 1,2,3,4,6,7,8-HpCDF in Sample SL0060 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

The OCDD results for samples SL0059 and SL0206 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

SDG E1801136: The OCDD results for samples SL0085, SL0124, SL0141, and SL0143 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

The results for 1,2,3,6,7,8-HxCDF in samples SL0124, SL0142, and SL0143 and 1,2,3,4,6,7,8-HpCDF in sample SL0128 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

SDG E1801137: The OCDD results for samples SL0136 and SL0131 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

The result for 1,2,3,6,7,8-HxCDF in sample SL0133 was flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

SDG E1801138: The OCDD results for samples SL0172 and SL0179 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

SDG E1801139: The OCDD result for sample SL0244 exceeded the calibration range of the instrument and were flagged with an "E". These results were estimated (J-20).

The result for 1,2,3,6,7,8-HxCDF in samples SL0225, SL0226, and SL0245 were flagged "P" indicating chlorodiphenyl ether interference. These results were estimated (J-23).

Calculation Verification

SDGs E1801012 and E1801020: Several results were verified by recalculation from the raw data for batch 326161. No calculation or transcription errors were found.

SDGs E1801045 and E1801056: Several results were verified by recalculation from the raw data for batch 327285. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory performed an acceptable modification of the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by labeled compound and LCS/LCSD %R values and precision was acceptable as demonstrated by the LCS/LCSD and field duplicate RPD values.

Detection limits were elevated due to ion ratio outliers and method blank contamination. Results were estimated due to chlorodiphenyl ether interferences, labeled compound recovery outliers, and results that exceeded the calibration range of the instrument.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
TCLP Volatile Organic Compounds - Method SW8260C

This report documents the review of analytical data from the analyses of TCLP leachate samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
K1811120	4 TCLP Leachate	Stage 2B
K1811381	2 TCLP Leachate	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exception, no discrepancies were found.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with collection date 11/3/18. The EDD was revised to reflect the correct client ID as SL0065 with collection date 11/5/18. Multiple entries were observed for pyridine. These entries were flagged as do-not-report (DNR) to indicate which results among multiple reported results not to use.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	GC/MS Instrument Performance (Tune)	1	Field Duplicates
✓	Initial Calibration (ICAL)	✓	Internal Standards
✓	Continuing Calibration (CCAL)	✓	Target Analyte List
✓	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Compound Identification
1	Surrogate Compounds	✓	Reported Results
2	Laboratory Control Samples (LCS)	1	Calculation Verification

✓Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control outliers are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Field Blanks

Field blanks were not submitted with this sampling event.

Surrogate Compounds

The surrogate compounds toluene-d8, 4-bromofluorobenzene, and dibromofluoromethane, were added to all samples. With the following exceptions, surrogate recoveries were within the laboratory control limits.

Both SDGs: Several samples exhibited recoveries of dibromofluoromethane slightly greater than the upper control limit indicating a potential high bias. Target analytes were not detected in the affected samples; no qualification was required.

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed at the required frequency of one per batch of 20 or fewer samples. With the exceptions noted below, spike recoveries were within the laboratory control limits.

SDGs K1811120 and K1811381: The LCS recovery for 2-butanone (MEK) was less than the lower control limit; associated results were estimated (UJ-10L).

Matrix Spike/Matrix Spike Duplicates

Matrix spikes were not analyzed with the data set. Accuracy was assessed using the surrogate and LCS recoveries. Precision could not be evaluated.

Field Duplicates

No field duplicates were submitted.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate and laboratory control sample (LCS) recovery values. Precision could not be evaluated.

Data were estimated due to LCS recovery outliers.

Extraneous results were flagged as do-not-report (DNR) to indicate which results among multiple reported results not to use. Data flagged as DNR should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
TCLP Semi-Volatile Organic Compounds by 8270D

This report documents the review of analytical data from the analyses of TCLP leachate samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples	Validation Level
K1811120	4 TCLP Leachate	EPA Stage 2B
K1811381	2 TCLP Leachate	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

SDG K1811381: The sample results forms indicate an extraction date of 1/3/18, however this date should be 1/3/19. The laboratory was contacted and confirmed that the correct date of extraction was 1/3/19 and corrected the forms in an updated data package.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with collection date 11/3/18. The EDD was revised to reflect the correct client ID as SL0065 with collection date 11/5/18.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

2	Sample Receipt, Preservation, and Holding Times	**1**	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	Tune	**1**	Field Duplicates
✓	Initial Calibration	✓	Internal Standards
✓	Continuing Calibration	✓	Target Analyte List
✓	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Surrogate Compounds	**1**	Compound Identification
2	Laboratory Control Sample (LCS)	1	Calculation Verification (Full validation only)

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811120: The leaching procedure for samples SL0064, SL0065, and SL0022 was conducted after the 14-day holding time had expired. All results were estimated (UJ-1).

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Both field samples were extracted for SVOC analysis after the 7-day holding time had expired. There were no target analytes detected in the samples; all results were estimated (UJ-1).

Field Blanks

No field blanks were submitted.

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed at the required frequency of one per batch of 20 or fewer samples. With the exceptions noted below, spike recoveries were within the laboratory control limits.

SDG K1811120: The LCS recovery for 2,4,6-trichlorophenol was less than the lower control limit; associated sample results were estimated (UJ-10L).

Matrix Spike/Matrix Spike Duplicates

Matrix spikes were not analyzed with the data set. Accuracy was assessed using the surrogate and LCS recoveries. Precision could not be evaluated.

Field Duplicates

No field duplicates were submitted.

Calculation Verification

SDG K1811381: Several results were verified by recalculation form the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. With the exception noted above, accuracy was acceptable, as demonstrated by the surrogate and LCS percent recoveries. Precision could not be evaluated.

Results were estimated based on exceeded holding times and an LCS recovery outlier.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
TCLP Chlorinated Pesticides by 8081B

This report documents the review of analytical data from the analyses of TCLP leachate samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples	Validation Level
K1811120	4 TCLP Leachate	EPA Stage 2B
K1811381	2 TCLP Leachate	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG K1811381: The initial calibration quantitation reports were missing from the data package. The laboratory was contacted and provided the missing information.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exception, no discrepancies were found.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with collection date 11/3/18. The EDD was revised to reflect the correct client ID as SL0065 with a collection date of 11/5/18. Multiple entries were observed for endrin, toxaphene, g-BHC, heptachlor, heptachlor epoxide, methoxychlor, and chlordane. These entries were flagged as do-not-report (DNR) to indicate which results among multiple reported results not to use.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

2	Sample Receipt, Preservation, and Holding Times	**1**	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration	**1**	Field Duplicates
✓	Continuing Calibration	✓	Target Analyte List
✓	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Reported Results
2	Surrogate Compounds	**1**	Compound Identification
1	Laboratory Control Sample (LCS)	1	Calculation Verification (Full validation only)

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811120: The leaching procedure for samples SL0064, SL0065, and SL0022 was conducted after the 14-day holding time had expired. All results were estimated (UJ-1).

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Field Blanks

No field blanks were submitted.

Surrogates

SDG K1811120: The tetrachloro-m-xylene recoveries were less than the lower control limit in all samples. No target analytes were detected; results were estimated (UJ-13L).

SDG K1811381: The decachlorobiphenyl recovery was less than the lower control limit in Sample SL0146; results were estimated (UJ-13L) for this sample.

Laboratory Control Sample

SDG K1811120: The recovery values for methoxychlor and toxaphene were greater than the upper control limit of 130%. These analytes were not detected in the associated field samples; no data were qualified.

Matrix Spikes/Matrix Spike Duplicates

SDG K1811120: Sample SL0084 was used for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The recovery values for methoxychlor were greater than the upper control limit. This analyte was not detected in the parent sample; no qualification was required.

Field Duplicates

No field duplicates were submitted.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, laboratory control sample, and MS/MSD recoveries. Precision was also acceptable as demonstrated by the MS/MSD relative percent difference values.

Results were estimated due to the holding time being exceeded for the leaching procedure and surrogate recovery outliers.

Extraneous results were flagged as do-not-report (DNR) to indicate which results among multiple reported results not to use. Data flagged as DNR should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
PCB Aroclors by Method SW8082A

This report documents the review of analytical data from the analyses of soil and wipe samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples	Validation Level
K1811120	2 Wipe	EPA Stage 2B
K1811381	1 Soil	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG K1811381: The initial calibration quantitation reports were missing from the data package. The laboratory was contacted and provided the missing documentation.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. No errors were noted.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed in the following table

1	Sample Receipt, Preservation, and Holding Times	✓	Laboratory Control Samples (LCS/LCSD)
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Continuing Calibration (CCAL)	✓	Target Analyte List
✓	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Compound Identification
✓	Surrogate Compounds	✓	Reported Results
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification (Full validation only)

✓Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control outliers are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Field Blanks

SDG K1811120: Two field blanks were submitted: FB0001 and FW0001. No target analytes were detected.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the appropriate frequency. No action is taken unless both the MS and MSD %R values are outside the control limits for MS/MSD %R outliers. Precision is indicated by the relative percent difference (RPD) between the MS and MSD values. Any RPD values outside the control limits indicate uncertainty in the measured results for the sample. Qualifiers were only issued to the parent sample.

SDG K1811381: The MS %R value for Aroclor 1260 was greater than the upper control limit. The MSD recovery was acceptable; no data were qualified based on this single outlier.

Field Duplicates

No field duplicates were submitted.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the surrogate, laboratory control sample/laboratory control sample duplicate (LCS/LCSD), and MS/MSD percent recovery values. Precision was also acceptable as demonstrated by the LCS/LCSD and MS/MSD relative percent difference values.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
TCLP Herbicides by 8151A

This report documents the review of analytical data from the analyses of TCLP leachates and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples	Validation Level
K1811120	4 TCLP Leachate	EPA Stage 2B
K1811381	2 TCLP Leachate	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

K1811120: The laboratory report was missing the continuing calibration summaries and raw data. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exception, no discrepancies were found.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with a collection date of 11/3/18. The EDD was revised to reflect the correct client ID of SL0065 with a collection date of 11/5/18.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

2	Sample Receipt, Preservation, and Holding Times	✓	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	Tune	**1**	Field Duplicates
✓	Initial Calibration	✓	Internal Standards
✓	Continuing Calibration	✓	Target Analyte List
✓	Laboratory Blanks	**1**	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Labeled Compounds/ Surrogate Compounds	✓	Compound Identification
✓	Laboratory Control Sample (LCS)	1	Calculation Verification

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811120: The leaching procedure for samples SL0064, SL0065, and SL0022 was conducted after the 14-day holding time had expired. All results were estimated (UJ-1).

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Field Blanks

No field blanks were submitted.

Field Duplicates

No field duplicates were submitted.

Reporting Limits

Reporting limits are greater than the those specified in the QAPP.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, laboratory control sample, and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Precision was also acceptable as demonstrated by the MS/MSD relative percent difference values.

Results were estimated due to the holding time being exceeded for the leaching procedure..

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
Gasoline Range Organics (GRO), Diesel Range Organics (DRO), and Residual Range Organics (RRO) - Method SW8015C & TX 1005

This report documents the review of analytical data from the analyses of soil and wipe samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Houston, Texas and ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
E1801020	1 Soil	Stage 4
K1811120	3 Soil & 2 Wipe	EPA Stage 2B
K1811381	3 Soil	Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exception, no discrepancies were found.

SDG K1811120: For the DRO/RRO reports, the laboratory mislabeled Sample K1811120-003 as FB0001 with a collection date of 11/3/18. The EDD was revised to reflect the correct client ID of SL0065 with a collection date of 11/5/18.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

2	Sample Receipt, Preservation, and Holding Times	✓	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration (ICAL)	1	Field Duplicates
2	Continuing Calibration (CCAL)	✓	Target Analyte List
1	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	2	Compound Identification
2	Surrogate Compounds	✓	Reported Results
1	Laboratory Control Samples (LCS)	1	Calculation Verification

✓Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control outliers are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of 2° to 6°C. With the following exception noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG K1811120: Samples FW0001 and FB0001 were extracted for DRO and RRO after the 14-day holding time, at 18 days. No target analytes were detected in these samples; results were estimated (UJ-1).

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Continuing Calibration

With the exception noted below, the percent difference (%D) values were within the 25% control limits for all continuing calibrations (CCAL).

SDG K1811120: In the CCAL from 12/06/18, the %D values for DRO and RRO were greater than the control limit of 25% and indicated a potential high bias. The associated sample results were not detected; no data were qualified.

SDG K1811381: In the CCAL from 10/24/18, the %D value for DRO was greater than the control limit of 25% and indicated a potential high bias. The DRO results in the associated samples were estimated (J-5BH).

Laboratory Blanks

A method blank was analyzed at the required frequency of one per batch of 20 or fewer samples. Action levels were established at five times (5x) the concentration reported in the field blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results.

SDG K1811120: DRO and RRO were detected in the extraction batch associated with the soil samples. Results for both analytes in the associated samples were greater than the action limit; no qualification was required.

SDG K1811381: DRO and RRO were detected. Results for both analytes in the associated samples were greater than the action limit; no qualification was required.

Field Blanks

SDG K1811120: Two field blanks, FW0001 and FB0001, were submitted. No target analytes were detected.

Surrogate Compounds

The surrogate compound 4-bromofluorobenzene was added to all samples for GRO analysis. The surrogate compounds o-terphenyl and n-triacontane were added to all samples for DRO/RRO analysis. With the following exception, the surrogate recoveries were within the laboratory control limits.

SDG K1811381: The 4-bromofluorobenzene recovery value was greater than the upper control limit in Sample SL0146. The GRO result for this sample was estimated (J-13H).

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed at the required frequency of one per batch of 20 or fewer samples. With the following exceptions, all spike recoveries were within the laboratory control limits.

SDG K1811120: The recovery values for DRO and RRO were greater than the upper control limits for the extraction batch associated with the wipe samples. These analytes were not detected in the associated samples; no data were qualified.

Field Duplicates

Field duplicates were not submitted.

Reporting Limits

The DRO and GRO reporting limits exceeded those specified in the QAPP.

Compound Identification

Both SDGs: For the DRO/RRO analyses, several reported results were flagged with an "O" or a "Y" indicating the chromatographic fingerprint matched petroleum but did not match the calibration standard. The associated results were estimated (J-14).

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, laboratory control sample, and MS/MSD recovery values and precision was acceptable as demonstrated by the MS/MSD relative percent difference values.

Data were estimated due to exceeded holding times, a CCAL %D outlier, a surrogate recovery outlier, and for chromatographic patterns that did not match those of the calibration standards.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
TCLP Metals - Method SW6010C and 7470A

This report documents the review of analytical data from the analyses of TCLP leachates and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples and Matrix	Validation Level
K1811120	4 TCLP Leachate	Stage 2B
K1811381	2 TCLP Leachate	EPA Stage 3

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exception, no discrepancies were found.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with a collection date of 11/3/18. The EDD was revised to reflect the correct client ID of SL0065 with a collection date of 11/5/18.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	✓	Laboratory Duplicates
✓	Initial Calibration	✓	Interference Check Samples
✓	Calibration Verification	✓	Serial Dilutions
✓	CRDL Standards	1	Field Duplicates
2	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Laboratory Control Samples (LCS)	✓	Calculation Verification
2	Matrix Spikes		

✓Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control outliers are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

Guidance documents state that the cooler temperature upon receipt at the laboratory should be between 0ºC and 6ºC.

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. For laboratory blanks that are less than the negative MDL, positive results less than the action level of five times the absolute value of the blank concentration are estimated (J-7) and non-detects are estimated (UJ-7L) to indicate a potential low bias.

Laboratory blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets.

SDG K1811120: One instrument blank had a selenium value that was greater than the detection limit. The selenium result for Sample AL0064 was qualified as not detected (U-7). One instrument blank had a result for cadmium that was less than the negative detection limit. Associated sample results were greater than the 5x action level; no data were qualified.

Field Blanks

No field blanks were submitted.

Matrix Spike

Matrix spike (MS) were analyzed at the proper frequency of one per 20 samples or one per batch for soil samples. Where analyte concentrations were less than 4x the spike amount, the percent recovery (%R) and relative percent difference (RPD) values were evaluated. If the percent recovery values indicate a potential low bias, associated results are estimated (J/UJ-8). If the %R values indicate a potential high bias, only the associated positive results are estimated (J-8).

The following analytes were qualified in one or more samples based on %R value outliers. Qualifiers were issued to all samples associated with a QC batch.

SDG K1811120: For batch 326966, Sample SL0022 was used for the matrix spike analysis. The MS recovery for silver was less than the lower control limit of 75%, at 57%. This was the only associated sample; the silver result was estimated (UJ-8L) to indicate a potential low bias.

Field Duplicates

No field duplicates were submitted.

Reporting Limits

Several samples were diluted due to interferences or other factors. Reporting limits were elevated accordingly.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical methods. With the exception noted above, accuracy was acceptable as demonstrated by the laboratory control sample and matrix spike recoveries. Precision was also acceptable as demonstrated by the laboratory duplicate relative percent difference values.

One detection limit was elevated based on an instrument blank value and one result was estimated due to a matrix spike recovery outlier.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto South Impoundments
Conventional Tests

This report documents the review of analytical data from the analysis of soil and wipe samples and the associated laboratory quality control (QC) samples. Samples were analyzed by ALS Environmental, Kelso, Washington and ALS Environmental, Holland, Michigan. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples and Matrix	Validation Level
K1811120	4 Soil & 2 Wipe	EPA Stage 2B
K1811381	3 Soil	EPA Stage 3

The analytical tests that were performed are summarized below:

Laboratory	Parameter	Method
ALS-Kelso	Sulfate	EPA 300.0
	Sulfur	SW9056A mod
	Flashpoint	SW 1020A
	pH	SW 9045D
	Reactive Sulfide	SW 9034M
	Total Solids	EPA 160.3 mod
ALS-Holland	Reactive Cyanide	SW 7.3.3.2

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the laboratory data package. With the following exceptions, no discrepancies were found.

The reactive cyanide results in the EDD were reported as not-detected (ND) at the method detection limit (MDL), but the summary forms had results reported as ND at the reporting limit (RL). The EDD is correct, no action was taken.

SDG K1811120: The laboratory mislabeled Sample K1811120-003 as FB0001 with a collection date of 11/3/18. The EDD was revised to reflect the correct client ID of SL0065 with a collection date of 11/5/18.

TECHNICAL DATA VALIDATION

This report documents the review of analytical QC requirements as listed in the following table.

2	Sample Receipt, Preservation, and Holding Times	✓	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration	✓	Laboratory Duplicates
✓	Calibration Verification	1	Field Duplicates
✓	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Laboratory Control Samples (LCS)	1	Calculation Verification (Full validation only)

✓Method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control results are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of ≤6°C. With the following exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG K1811120: Several samples were analyzed for reactive cyanide, moisture, pH, and total solids after the holding times had expired. Results for these analytes were estimated (J/UJ-1).

SDG K1811381: One cooler temperature was less than the lower control limit, at -5.5ºC. Samples were not affected by the temperature outlier; no action was taken.

All samples were analyzed for pH, sulfate, and total solids after the holding times had expired. Results for these analytes were estimated (J-1).

Field Blanks

SDG K1811120: Two field blanks were submitted, FW0001 and FB0001. No target analytes were detected.

Field Duplicate

No field duplicates were submitted.

Calculation Verification

SDG K1811381: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the laboratory control sample and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Precision was also acceptable as demonstrated by the laboratory duplicate and MS/MSD relative percent difference values.

Results were estimated based on exceeded holding times.

All data, as qualified, are acceptable for use.

ECOCHEM
Data Quality

APPENDIX A

DATA QUALIFIER DEFINITIONS
REASON CODES
AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler temperature, pH, summa canister pressure); Exceeded Holding Times
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
	5A	Initial Calibration (RF, %RSD, r^2)
	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L)[1] where appropriate
	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L)[1] where appropriate
Blank Contamination	6	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
	7	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L)[1] for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L)[1] where appropriate
	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L)[1] where appropriate
	12	Reference Material Use bias flags (H,L)[1] where appropriate
	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L)[1] where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L)[1] where appropriate
	19	Internal Standard Performance (i.e., area, retention time, recovery)
	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
	3	2nd column confirmation (RPD or %D)
	4	Tentatively Identified Compound (TIC) (associated with NJ only)
	20	Calibration Range or Linear Range Exceeded
	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, re-extractions, etc. Associated with “R” and “DNR” only)
	14	Other (See DV report for details)
	26	Method QC information not provided

[1] H = high bias indicated
L = low bias indicated

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues <-10°C & in the dark **Preservation Aqueous:** If Cl_2 is present Thiosulfate must be added and if pH > 9 it must be adjusted to 7 - 9	NFG [1] Method[2]	J(pos)/R(ND) if thiosulfate not added if Cl_2 present; J(pos)/UJ(ND) if pH not adjusted J(pos)/UJ(ND) if temp > 20°C	1	**EcoChem PJ, see TM-05**
Holding Time	**If properly stored, 1 year or:** **Extraction (all matrices):** 30 days from collection **Analysis (all matrices)**: 45 days from extraction	NFG [1] Method[2]	If not properly stored or HT exceedance: J(pos)/UJ(ND)	1	**EcoChem PJ, see TM-05** Gross exceedance = > 1 year 2011 NFG **Note:** Under CWA, SDWA, and RCRA the HT for H2O is 7 days.
Instrument Performance					
Mass Resolution (Tuning)	PFK (Perfluorokerosene) ≥10,000 resolving power at m/z 304.9824. Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift.	NFG [1] Method [2]	R(pos/ND) all analytes in all samples associated with the tune	24	Notify PM
Windows Defining Mix	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level)	NFG [1] Method [2]	If peaks are not completely within windows (clipped): If natives are ok, J(pos)/UJ(ND) homologs (Totals) If natives are affected, R all results for that selector group	24	Notify PM
Column Performance Mix	Both mixes must be analyzed before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) where x = ht. of TCDD (or TCDF) & y = baseline to bottom of valley For all isomers eluting near the 2378-TCDD (TCDF) peak (TCDD only for 8290)	NFG [1] Method [2]	J(pos) if valley > 25%	24	**EcoChem PJ, see TM-05, Rev. 2**; Note: TCDF is evaluated only if second column confirmation is performed
Initial Calibration **Sensitivity**	S/N ratio > 10 for all native and labeled compounds in CS1 std.	NFG [1] Method [2]	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration **Selectivity**	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG [1] Method [2]	If 2 or more ion ratios are out for one compound in ICAL, J(pos)	5A	**EcoChem PJ, see TM-05, Rev. 2**

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration (Minimum 5 stds.) **Stability**	%RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD < 35% for labeled compounds under 1613b)	NFG (1) Method (2)	J(pos) natives if %RSD > 20%	5A	
	Absolute RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 & >15 min on DB-225	NFG (1) Method (2)	Narrate, no action		**EcoChem PJ, see TM-05, Rev. 2**
Continuing Calibration (Prior to each 12 hr. shift) **Sensitivity**	S/N ratio for CS3 standard > 10	NFG (1) Method (2)	If <10, elevate Det. Limit or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) **Selectivity**	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG (1) Method (2)	For congener with ion ratio outlier, J(pos) natives in all samples associated with CCAL. No action for labeled congener ion ratio outliers.	25	**EcoChem PJ, see TM-05**
Continuing Calibration (Prior to each 12 hr. shift) **Stability**	%D+/-20% for native compounds %D +/-30% for labeled compounds **(Must meet limits in Table 6, Method 1613B)** If %D in the closing CCAL are within 25%/35%, the mean RF from the two CCAL may be used to calculate samples **(Section 8.3.2.4 of 8290**).	NFG (1) Method (2)	**Labeled compounds:** Narrate, no action. **Native compounds:** 1613: J(pos)/UJ(ND)if %D is outside Table 6 limits J(pos)/R(ND) if %D is +/-75% of Table 6 limits 8290: J(pos)/UJ(ND) if %D = 20% - 75% J(pos)/R(ND) if %D > 75%	5B (H,L)[3]	
	Absolute RT of $^{13}C_{12}$-1234-TCDD and $^{13}C_{12}$-123789-HxCDD should be ± 15 seconds of ICAL RRT for all other compounds must meet criteria listed in Table 2 Method 1316.	NFG (1) Method (2)	Narrate, no action	5B	**EcoChem PJ, see TM-05**
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG (1) Method (2)	U(pos) if result is < 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review FB , qualify as needed**
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL		U(pos) if result is < 5X action level.	6	

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias **PJ if only one %R outlier**	8 (H,L)[3]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) Use most current laboratory control limits **or** Limits from Table 6 of 1613B	NFG (1) Method (2)	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L)[3]	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	**LCSD not typically required for HRMS analyses.** One set per matrix and batch of 20 samples RPD < 35%	Method (2) Ecochem standard policy	J(pos) assoc. compound in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD)	**Lab Dup not typically required for HRMS analyses.** One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	
Labeled Compounds (Internal Standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG (1) Method (2)	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	13 (H,L)[3]	
Field Duplicates	Solids: RPD <50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project	9	**Use professional judgment**

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within ± 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in Table 8 Method 8290, or Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG (1) Method (2)	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	**EcoChem PJ, see TM-05**
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	NFG (1) Method (2)	If laboratory correctly reported an EMPC value, qualify the native compound U(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	**Use professional judgment See TM-18**
Interferences	Interferences from chlorodiphenyl ether compounds	NFG (1) Method (2)	J(pos)/UJ(ND) if present	23	**See TM-16**
	Lock masses must not deviate ± 20% from values in Table 8 of 1613B	Method (2)	J(pos)/UJ(ND) if present	24	**See TM-17**
Second Column Confirmation	All 2,3,7,8-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC criteria must also be met for the confirmation analysis.	NFG (1) Method (2)	Report the DB-225 value. If not performed use PJ.	3	DNR-11 DB5 result if both results from both columns are reported. **EcoChem PJ, see TM-05**
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

(pos) - positive (detected) results; (ND) - not detected results

[1] National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2011

[2] Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), USEPA SW-846, Method 8290

[2] EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994

[3] NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

Volatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8260C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C±2°C Aqueous: HCl to pH < 2 Current SW846 criterion is ≤ 6° C (3)	NFG (1) Method (3)	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use **PJ** for temp outliers; see **TM20** if pH ≤ 2, reject 2-chloroethyl vinyl ether (R-1) some projects may require methanol preserved soils/seds
Holding Time	**Aqueous:** 14 days preserved 7 Days: unpreserved **Solid:** 14 Days	NFG (1) Method (3)	J (pos)/UJ (ND) if HT exceeded J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Gross exceedance = > 2x HT, as per 1999 NFG
Instrument Performance					
Tuning	BFB Beginning of each 12 hour period Use method or project acceptance criteria	NFG (1) Method (3)	R (pos/ND) all analytes in all samples associated with the tune	24	
Initial Calibration **Sensitivity**	Minimum 5 standards RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders * RRF ≥ 0.005 1,4-dioxane	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5A	**TM-06** EcoChem Policy for the Evaluation and Qualification of GCMS Instrument Performance **PJ** - no action if response is stable (ICAL RSD and CCAL %D acceptable)
Initial Calibration **Stability**	%RSD ≤ 20% except: %RSD ≤ 40% poor responders * %RSD ≤ 50% 1,4-dioxane	NFG (1) Method (3)	J (pos) if %RSD > limit	5A	
Initial Calibration Verification	Second source analyzed immediately after ICAL %R 70% - 130%	Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) %R < LCL	5A (H,L)[4]	QAPP may have overriding accuracy limits.
Continuing Calibration **Sensitivity**	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders * RRF ≥ 0.005 1,4-dioxane	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5B	see ICAL RRF guidance
Continuing Calibration **Stability**	%D ≤ 25% except: %D ≤ 40% poor responders * %D ≤ 50% 1,4-dioxane	NFG (1) Method (3)	J (pos) - %D > control limit (high bias) J (pos)/UJ (ND) - %D < -control limit (low bias)	5B (H,L)[4]	

Volatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8260C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch (of ≤ 20 samples) No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	7	10X action level for methylene chloride, acetone, & 2-butanone. 5X for all other target analytes **Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review TB, qualify as needed** **#3 - Review FB, qualify as needed** **Note: Actions as per NFG 1999**
	No TICs present		R (pos) TICs using 10X rule		
Trip Blank (TB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Field Blank (FB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Precision and Accuracy					
LCS/LCSD (recovery)	One per matrix per batch (of ≤ 20 samples) LCSD not required by NFG or method Use method acceptance criteria/laboratory limits	Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND)%R < 10%	10 (H,L)[4]	No action if only one spike %R is outside criteria when LCSD is analyzed, unless one recovery is <10%. QAPP may have overriding accuracy limits.
LCS/LCSD RPD	If LCSD analyzed RPD < lab limits	Method (3)	J (pos)	9	Qualify all associated samples. QAPP may have overriding precision limits.
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[4]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Surrogates	Added to all samples Within method/laboratory control limits	NFG (1) Method (3)	J (pos) if %R >UCL J (pos)/UJ (ND) if %R <LCL J (pos)/R (ND) if <10%	13 (H,L)[4]	No action if there are 4+ surrogates and only 1 outlier Qualify all compounds if qualification is required.
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	NFG (1) Method (3)	J (pos) if > 200% J (pos)/UJ (ND) if < 50% J (pos)/R (ND) if < 25% if RT >30 seconds use **PJ**	19	Qualify compounds quantified using particular internal standard

Volatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8260C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy (continued)					
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) if both %R < LCL J (pos)/R (ND) if both %R < 10% J (pos)/UJ (ND) if one > UCL & one < LCL, with no bias	8 (H,L)[4]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only.
MS/MSD (RPD)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) If RPD > control limit	9	Qualify parent sample only
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified
Compound Identification and Quantitation					
Retention Time Relative Ion Intensities	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	NFG (1) Method (3)	U (pos) if identification criteria not met	25	
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NFG (1) Method (3)	NJ TIC R (pos) if common laboratory contaminants	4	Common laboratory contaminants: aldol condensation products, solvent preservatives, and reagent contaminants
Calibration Range	Results greater than highest calibration standard	EcoChem standard policy	Qualify J (pos)	20	If result from dilution analysis is not reported.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

1 National Functional Guidelines for Organic Data Review, June, 2008
2 National Functional Guidelines for Organic Data Review, Oct, 1999
3 Method SW846 8260C Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
4 NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

(pos): Positive Result
(ND): Non-detect

* "Poor responder" compounds: Acetone, 2-butanone, carbon disulfide, chloroethane, chloromethane, cyclohexane, 1,2-dibromoethane, dichlorodifluoromethane, cis-1,2-dichloroethene, 1,2-dichloropropane, 1,2-dibromo-3-chloropropane, 2-hexanone, isopropylbenzene, methyl acetate, methylene chloride, methylcyclohexane, 4-methyl-2-pentanone, methyl tert-butyl ether, trans-1,2-dichloroethene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane **criterion is 0.010 RRF;** 1,4-dioxane RRF **criterion is 0.005**.

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C±2°C sediment/tissues may require storage at -20°C	NFG (1) Method (3)	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use **PJ** for temp outliers; see **TM20** Current SW846 criterion is ≤ 6° C (3)
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Analysis (all matrices)**: 40 days from extraction Holding time may be extended to 1 year for frozen sediments/tissues	NFG (1) Method (3)	J (pos)/UJ (ND) if HT exceeded J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Gross exceedance = > 2x HT, as per 1999 NFG
Instrument Performance					
Tuning	DFTPP Beginning of each 12 hour period Use method or project acceptance criteria	NFG (1) Method (3)	R (pos/ND) all analytes in all samples associated with the tune	24	
Initial Calibration **Sensitivity**	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5A	**TM-06** EcoChem Policy for the Evaluation and Qualification of GCMS Instrument Performance **PJ** - no action if response is stable (ICAL RSD and CCAL %D acceptable)
Initial Calibration **Stability**	Minimum 5 standards %RSD ≤ 20.0% except: %RSD ≤ 40.0% poor responders * **or** co-efficient of determination (r^2) > 0.99	NFG (1) Method (3)	J (pos) if %RSD > limit **or** r^2 value <0.99	5A	
Initial Calibration Verification Check	Prepared from second source; analyze after each ICAL Percent recovery limits = 70-130%	Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) %R < LCL	5A (H,L)[4]	QAPP may have overriding accuracy limits.

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Continuing Calibration **Sensitivity**	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5B	see ICAL RRF guidance
Continuing Calibration **Stability**	Prior to sample analysis and every 12 hours %D ≤ 25% except: %D ≤ 40.0% poor responders *	NFG (1) Method (3)	J (pos) - %D > control limit (high bias) J (pos)/UJ (ND) - %D < -control limit (low bias)	5B (H,L)[4]	
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > MDL	NFG (2) Method (3)	U(pos) if result is < 5X or 10X action level	7	10X action level applies to phthalates only. 5X for all other target analytes **Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review FB , qualify as needed** **Note: Actions as per 1999 NFG**
	No TICs present		R (pos) TICs using 10X rule	7	
Field Blank (FB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Precision and Accuracy					
LCS/LCSD (recovery)	One per matrix per batch (of ≤ 20 samples) LCSD not required by NFG or method Use method acceptance criteria/laboratory limits	Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND)%R < 10%	10 (H,L)[4]	No action if only one spike %R is outside criteria when LCSD is analyzed, unless one recovery is <10%. QAPP may have overriding accuracy limits. Qualify all associated samples.
LCS/LCSD (RPD)	If LCSD analyzed RPD < lab limits	Method (3)	J (pos)	9	Qualify all associated samples. QAPP may have overriding precision limits.

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy (continued)					
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[4]	QAPP may have overriding accuracy limits. Some manufacturers have different RM control limits
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) if both %R < LCL J (pos)/R (ND) if both %R < 10% J (pos)/UJ (ND) if one > UCL & one < LCL, with no bias	8 (H,L)[4]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only.
MS/MSD (RPD)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (2)	J (pos) in parent sample if RPD > CL	9	Qualify parent sample only
Surrogates	Minimum of 3 acid & 3 base/neutral (B/N) compounds added to all samples Within method control limits	NFG (1) Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	13 (H,L)[4]	Qualify all compounds in associated fraction. Do not qualify if only 1 acid and/or 1 B/N surrogate is out, unless <10%. If 1 surrogate outlier < 10% then J (pos)/R (ND)
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	NFG (1) Method (3)	J (pos) if > 200% J (pos)/UJ (ND) if < 50% J (pos)/R (ND) if < 25% if RT >30 seconds use **PJ**	19	Qualify compounds quantified using particular internal standard
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification and Quantitation and Calculation					
Retention times and relative ion intensities	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	NFG (1) Method (3)	U (pos) if identification criteria not met	25	
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NFG (1) Method (3)	NJ the TIC unless: R (pos) common laboratory contaminants	4	
Calibration Range	Results greater than highest calibration standard	EcoChem standard policy	Qualify J (pos)	20	If result from dilution analysis is not reported.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

1 National Functional Guidelines for Organic Data Review, June, 2008

2 National Functional Guidelines for Organic Data Review, October, 1999

3 Method SW846 8270D Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 4, February 2007.

4 NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

(pos): Positive Result(s)
(ND): Non-detects

* "Poor responder" compounds: acetophenone, atrazine, benzaldehyde, 1,1'-biphenyl, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, caprolactam, carbazole, 4-chloroaniline, diethylphthalate, di-n-butylphthalate, 3-3'-dichlorobenzidine, dimethylphthalate, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, di-n-octylphthalate, hexachlorobutadiene, hexachlorocyclopentadiene, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 4-nitrophenol, N-nitrosodiphenylamine, 2,2'-oxybis-(1-chloropropane), 1,2,4,5-tetrachlorobenzene use a 0.010 RRF criterion.

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C ± 2°C Tissue/sediments (may be frozen -20°C)	NFG (2) Method (3)	J (pos)/UJ (ND) if greater than 6° C	1	Use Professional Judgment (PJ) to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C(3)
Holding Time	*Extraction Aqueous:* 7 days from collection *Extraction Solid:* 14 days from collection *Exraction Tissue/Sediment (frozen):* 1 year *Analysis (all matrices):* 40 days from extraction	NFG (2) Method (3)	J (pos)/UJ (ND) if ext/analyzed > HT J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Gross exceedance > 2x HT, as per NFG 1999
Instrument Performance					
Resolution Check	Beginning of ICAL sequence Within RTW and resolution > 60%	NFG (2)	NJ (pos)/R (ND) results	14	CLP criterion; might not be submitted with SW846 data package
Retention Times	Surrogates: TCMX (± 0.05); DCB (± 0.10) Target analytes: within RTW	NFG (2) Method (3)	NJ (pos)/R (ND) results for analytes with RT shifts	24	Use PJ based on examination of raw data
Breakdown	DDT Breakdown: ≤ 20% Endrin Breakdown: ≤ 20% Combined Breakdown: ≤ 30% Compounds within RTW	NFG (2) Method (3)	If 4,4'-DDT is detected: J (pos) 4,4'-DDT, 4,4'-DDD and 4,4'-DDE If 4,4'-DDT is ND and either 4,4'-DDD or 4,4'-DDE are detected: R (ND) 4,4'-DDT, NJ (pos) DDD and DDE If Endrin is detected: J (pos) Endrin, Endrin Aldehyde and Endrin Ketone If Endrin is ND and either EA or EK are detected: R (ND) Endrin, NJ (pos) EA and EK	5A	Method 8081B breakdown criterion: ≤ 15%. For combined breakdown outliers, apply qualifiers considering the degree of individual breakdown.

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration	Single Component Compounds: RSD ≤ 20% alpha-BHC and delta-BHC: RSD ≤ 25% toxaphene and surrogates: RSD ≤ 30% **or** correlation coefficient (r-value) ≥ 0.995 OR Minimum 6-point with coefficient of determination (r^2-value) ≥ 0.99	NFG (2) Method (4)	J (pos) if %RSD greater than control limit **or** r-value < 0.995 **or** r^2-value < 0.99	5A	Refer to TM-01 for additional information. Use bias flags (H,L) (6) where appropriate
Initial Calibration Verification (ICV)	No NFG criteria Project specific	Project QAPP	J (pos) if > UCL J (pos)/UJ (ND) if < LCL	5B	Use bias flags (H,L) (6) where appropriate
Continuing Calibration	%D ± 20% Analyzed prior to each 12 hour shift	Method (3)	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5B	Refer to TM-01 for additional information. Use bias flags (H,L)(6) where appropriate
Blank Contamination					
Method Blank (MB)	One per matrix per batch (of ≤ 20 samples) No detected compounds > RL	NFG (1) Method (3)	U (pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** #1 - Review MB and IB, qualify as needed #2 - Review FB , qualify as needed **Note: Actions as per NFG 1999** Note: IB not required by method
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG (1) Method (3)	U (pos) if result is less than appropriate 5X action level.	6	
Instrument Blanks (IB)	Analyzed at the beginning and end of every 12 hour sequence No analyte > CRQL	NFG (1)	U (pos) if result is less than appropriate 5X action level.	7	

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2) Method (3)	Qualify parent only unless other QC indicates systematic problems. J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL) J (pos)/R (ND) if both %R < 10%	8	No action if only one spike %R is outside criteria No action if native analyte conc. > 5x the amount spiked Use bias flags (H,L) (6) where appropriate
MS/MSD (RPD)	One set per matrix per batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2) Method (3)	Qualify parent only unless other QC indicates systematic problems. J (pos) if RPD > control limit	9	No action if parent is ND
LCS	One per lab batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	10	Qualify all associated samples. Use bias flags (H,L) (6) where appropriate
LCS/LCSD (RPD)	if analyzed use MS/MSD RPD criteria	NFG (2)	J (pos) assoc. compound in all samples	9	LCSD not required by method or NFG
Surrogates	TCMX and DCBP added to every sample %R = 30% - 150% **or** project limits	NFG (2) Method (3)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCL J (pos)/R (ND) if either %R < 10%	13	If %R < 10% (dilution is a factor), use PJ Use bias flags (H,L) (6) where appropriate
Internal Standards (if used)	Acceptable Range: IS area = 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (3)	J (pos) if area > 200% J (pos)/UJ (ND) if area < 50% J (pos)/R (ND) if area < 25% RT > 30 seconds, narrate	19	

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy (continued)					
Field Duplicates	**Solids:** RPD < 50% **or** difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% **or** difference < 1X RL (for results < 5X RL)	EcoChem standard practice	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified
Compound Identification/Quantification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D < 25% Within Retention Time Windows on both columns.	NFG (2) Method (3)	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60% R (pos) if RTW criterion not met	3	See TM-08 for additional info
Calibration Range	On-column concentration < high calibration standard	NFG (2) Method (3)	J (pos) if conc > high standard and sample was not diluted	20	
Dilutions Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	TM-04 for additional info
Sample Clean-up					
GPC/Sulfur/ Florisil	GPC or Florisil cleanup stndards 80% - 120%	NFG (2)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	14	Cleanups are optional under SW846 Use bias flags (H,L) (6) where appropriate

1 National Functional Guidelines for Organic Data Review, October 1999
2 National Functional Guidelines for Organic Data Review, June, 2008
3 Organochlorine Pesticides by Gas Chromatography USEPA Method SW846 8081B, Feb 2007, Rev. 2
4 SW846, Chapter 4, Organic Analytes
5 Determinative Chromatographic Separations , Method 8000C , March 2003, Rev.3
6 NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample					
Cooler/Storage Temperature Preservation	4°C ± 2°C Tissue/sediments (may be frozen -20°C)	NFG (1) Method (2)	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use Professional Judgment (PJ) to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C (3)
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Exraction Tissue/Sediment (frozen):** 1 year **Analysis (all matrices)**: 40 days from extraction	NFG (1) Method (2)	**If required by project:** J (pos)/UJ (ND) if ext/analyzed > HT J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Use PJ to qualify for holding time outlier. ***Current SW846 does not have an extraction holding time limit.*** (3) Gross exceedance > 2x HT, as per NFG 1999
Instrument Performance					
Retention Times	Surrogates: TCMX (± 0.05); DCB (± 0.10) Aroclors (± 0.07)	NFG (1)	NJ (pos)/R (ND) results for analytes with RT shifts	24	
Initial Calibration	Minimum 5 point with RSD ≤ 20% OR correlation coefficient (r-value) ≥ 0.995 OR Minimum 6-point with co-efficient of determination (r2-value) ≥ 0.99	NFG (1) Method (4)	J (pos) if %RSD greater than 20% OR r-value < 0.995 OR r^2-value < 0.99	5A	Refer to TM-01 for additional information. Use bias flags (H,L)(5) where appropriate
Initial Calibration Verification (ICV)	No NFG criteria. Project specific.	Project	J (pos) if > UCL J (pos)/UJ (ND) if < LCL	5B	Use bias flags (H,L) where appropriate
Continuing Calibration (Prior to each 12 hr. shift)	%D ± 20%	Method (2)	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5B	Refer to TM-01 for additional information. Use bias flags (H,L) where appropriate
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG (1) Method (2)	U (pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB and IB, qualify as needed** **#2 - Review FB , qualify as needed** Note: Actions as per NFG 1999 Note: IB not required by method
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG (1) Method (2)	U (pos) if result is less than appropriate 5X action level.	6	
Instrument Blanks (IB)	Analyzed at the beginning and end of every 12 hour sequence No analyte > CRQL	NFG (1)	U (pos) if result is less than appropriate 5X action level.	7	

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) AR1016 and AR1260: %R = 29% - 135%, or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL) J (pos)/R (ND) if both %R < 10%	8	No action if only one spike %R is outside criteria. No action if native analyte conc. > 5x the amount spiked. Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in parent sample.
MS/MSD (RPD)	One set per matrix per batch (of ≤ 20 samples) AR1016: RPD < 15%, AR1260: RPD < 20% or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if RPD > control limit	9	No action if parent is ND.
LCS	One per lab batch (of ≤ 20 samples) AR1016 and AR1260: %R = 50% - 150%, or project limits	NFG (1)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	10	Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in associated samples.
LCS/LCSD (RPD)	if analyzed use MS/MSD RPD criteria	NFG (1)	J (pos) assoc. compound in all samples	9	LCSD not required by method or NFG
Precision and Accuracy					
Surrogates	TCMX and DCBP added to every sample %R = 30% - 150% or project limits	NFG (1) Method (2)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCL J (pos)/R (ND) if either %R < 10%	13	If %R < 10% (sample dilution is a factor), use PJ Use bias flags (H,L) where appropriate
Internal Standards (if used)	Acceptable Range: IS area = 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (2)	J (pos) if area > 200% J (pos)/UJ (ND) if area < 50% J (pos)/R (ND) if area < 25% RT > 30 seconds, narrate	19	
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	use project limits if specified

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification/Quantification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D < 25% Within Retention Time Windows on both columns.	NFG (1) Method (2)	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60% R (pos) if RTW criterion not met	3	See TM-08 for additional info.
Calibration Range	on column concentration < high calibration standard	NFG (1) Method (2)	J (pos) if conc > high standard and sample was not diluted	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	TM-04 Rev. 1 for additional info.
Sample Clean-up					
GPC/Sulfur/ Florisil/Acid	No criteria - cleanups are optional	NFG (1) Method (2)	Use Professional Judgment	14	special cleanups may be required for project cleanup standards may be associated with GPC/florisil cleanups

[1] National Functional Guidelines for Organic Data Review, June, 2008
[2] Polychlorinated Biphenyls (PCBs) by Gas Chromatography USEPA Method SW846 8082A, Feb 2007, Rev. 1
[3] SW846, Chapter 4, Organic Analytes
[4] Determinative Chromatographic Separations , Method 8000C , March 2003, Rev.3
[5] "H" = high bias indicated; "L" = low bias indicated

Chlorinated Herbicides by GC, SW-846 Method 8151A

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C±2°C Protected from light	NFG (1) Method (2)	J(pos)/UJ(ND) if > 6 deg. C (EcoChem PJ)	1	Use Professional Judgment (PJ) to qualify for temperature outlier.
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Analysis (all matrices)**: 40 days from extraction	NFG (1) Method (2)	J(pos)/UJ(ND) if HT exceeded J(pos)/R(ND) if gross exceedance(> 2X HT)	1	Use PJ to qualify for holding time outlier. Gross exceedance = > 2X HT, as per 1999 NFG
Instrument Performance					
Retention Times	Target compounds: Within RTW etablished by the laboratory.	NFG (1) Method (2)	NJ(pos)/R(ND) results for analytes with RT shifts	5B	Analyte RRT should be within ± 0.06 RRT units of the standard RRT (opening CCAL or midpoint ICAL standard). For full DV, use **PJ** based on examination of raw data.
Initial Calibration	5 standard minimum. Calibration may be internal or external. RSD ≤20%	NFG (1) Method (2)	J (pos) if > UCL J (pos)/UJ (ND) if < LCL OR r-value ≥ 0.99	5A	**TM-01** for additional information EcoChem Policy for the Evaluation of GC & HPLC Initial and Continuing Calibration using Method-Specific Control Limits. Calibration from methyl ester compounds (that have not undergone hydrolysis and esterfication) will need MW correction.
Continuing Calibration (Prior to each 12 hour shift or bracketing for external standard calibration)	%D ± 20%	NFG (1) Method (2)	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5A (H,L)[3]	**TM-01** for additional information EcoChem Policy for the Evaluation of GC & HPLC Initial and Continuing Calibration using Method-Specific Control Limits
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG (1) Method (2)	U(pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review FB , qualify as needed** No common lab contaminants for Herbacide analyses
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG (1) Method (2)	U(pos) if result is less than appropriate 5X action level.	6	

Chlorinated Herbicides by GC, SW-846 Method 8151A

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) Method acceptance criteria or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL)J (pos)/R (ND) if both %R < 10%	8 (H,L)[3]	A sample duplicate may be run in place of the MSD. No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only.
MS/MSD or duplicate (RPD)	One set per matrix per batch (of ≤ 20 samples) Method acceptance criteria or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J(pos) if RPD > control limit	9	No action if parent is ND.
LCS	One per lab batch (of ≤ 20 samples) Method acceptance criteria or project limits	NFG (1) Method (2)	Qualify all associated samples J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias **PJ if only one %R outlier**	10 (H,L)[3]	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	One set per lab batch (of ≤ 20 samples) Method acceptance criteria or project limits	NFG (1) Method (2)	J(pos) assoc. compound in all samples	9	
Surrogates	2,4-Dichlorophenylacetic acid (DCAA) added to every sample Method acceptance criteria or project limits	NFG (1) Method (2)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCLJ (pos)/R (ND) if either %R < 10%	13 (H,L)[3]	If %R < 10% (sample dilution is a factor), use PJ
Internal Standards (if used)	Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (2)	J (pos) if > 200% J (pos)/UJ (ND) if < 50% J (pos)/R (ND) if < 25% if RT >30 seconds use PJ	19	Suggested internal standards: 4,4'-dibromooctafluorobiphenyl (DBOB) or 1,4-dichlorobenzene.
Field Duplicates	**Solids**: RPD <50% OR difference < 2X RL (for results < 5X RL) **Aqueous**: RPD <35% OR difference < 1X RL (for results < 5X RL)		J(pos)/UJ(ND) Qualify only field duplicate samples	9	

Chlorinated Herbicides by GC, SW-846 Method 8151A

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D<25% Within Retention Time Windows on both columns. Alternitively GC/MS may be used for confirmation.	NFG [(1)] Method [(2)]	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60%R (pos) if RTW criterion not met	3 25 (false pos)	See TM-08 for additional info.
Calibration Range	Results exceed the upper calibration range	EcoChem standard policy	J (pos) if conc > high standard and sample was not diluted	20	
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.	EcoChem standard policy	Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04 Rev. 1** EcoChem Policy for for additional info.

[1] National Functional Guidelines for Organic Data Review, June, 2008, based on Pesticide Review
[2] Organochlorine Herbicides by GC using Methlyation or Pentafluorobenzylation Derivatization USEPA Method SW846 8151A, Dec. 1
[3] "H" = high bias indicate; "L" = low bias indicated

(pos): Positive Result(s)
(ND): Non-detects

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons
(Based on EPA National Functional Guidelines as applied to Method 8015B)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature & Preservation	4°C ±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6°C for volatiles (use EcoChem PJ for semi-volatiles)	1
Holding Time	Waters: 14 days preserved 7 days unpreserved Solids: 14 Days Analysis: 40 days from extraction	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded by > 2X (EcoChem PJ)	1
Retention Time Windows	Volatile Range: Lower limit of 2-methylpentane and Upper limit of 1,2,4-Trimethylbenzene Extractable Range : Lower limit of C10 and Upper limit of C28	J(+)/UJ(-) (EcoChem PJ)	N/A
Initial Calibration	Minimum 5 calibration levels Linear regression: $R^2 \geq 0.990$ RSD of response factors: $\leq$20%	J(+)/UJ(-) if R^2 <0.990 J(+)/UJ(-) if %RSD > 20%	5A
Continuing Calibration Verification (CCV)	Prior to analysis and after max. 20 samples or 12 hours, whichever comes first. %D <15%	Narrate if frequency criteria not met. J(+) If %R > 115% J(+)/UJ(-) If %R < 85% J(+)R(-) if %D > 90% (EcoChem PJ)	5B
Method Blank	One per matrix per batch (max. 20 samples) No results $\geq$RL	U (at RL) if sample result is less than RL and less than 5X blank result	7
		U (at reported sample value) if sample result is greater than or equal to RL and less than 5X blank result	7
Field Blank (Not Required)	Not addressed by NFG or SW-846 No results > RL	Same as method blank for positive results remaining in field blank after method blank qualifiers are assigned	6
MS/MSD	One per matrix per batch Lab limits or QAPP criteria	Narrate if frequency not met. Qualify parent only unless other QC indicates systematic problems. J(+) if both %R > UCL; J(+)/UJ(-) if both %R < LCL EcoChem PJ if only one %R outlier No action if parent conc. > 5x the amount spiked.	8

EcoChem Validation Guidelines for Total Petroleum Hydrocarbons
(Based on EPA National Functional Guidelines as applied to Method 8015B)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Precision: MS/MSD or LCS/LCSD or Sample/Duplicate	One per matrix per batch Lab limits or QAPP criteria	J(+) if RPD > laboratory CL	9
LCS or LCS/LCSD	One per matrix per batch Lab limits or QAPP criteria	J(+)/UJ(-) If %R < LCL J(+) If > UCL J(+)/R(-) If any %R <10%	10
Surrogates	Added to all samples (inc. QC samples) Lab limits or QAPP criteria	J(+)/UJ(-) If %R < LCL J(+) If > UCL J(+)/R(-) If any %R <10% No action if 2 or more surrogates are used and only one is <LCL or >UCL (EcoChem PJ)	13
Pattern Identification	Compare sample chromatograms with standards to ensure that range and pattern are a reasonable match. Laboratory may flag results which have a poor match.	J (+)	3
Field Duplicate	Water: RPD < 35% Soil: RPD < 50%	Narrate (J/UJ if required by project instructions)	9
Two analyses for one sample (e.g. dilution)	Report only one result per analyte	"DNR" results that should not be used to avoid reporting multiple results for one sample. Refer to Tech. Memo TM-04	11

Metals by ICP-AES
(Based on Inorganic NFG 2010 and SW-846 6010C)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler / Storage Temperature Preservation	**Solid:** Cooler temperature 4°C±2°C **Aqueous:** Nitric Acid to pH < 2 **Dissolved Metals:** 0.45 µm filter, preserve to pH < 2 after filtration	NFG (1) Method (2)	Cooler Temps: **If required by project** J (pos)/UJ (ND) if greater than 6° C Aqueous: J (pos)/UJ (ND) if pH > 2	1	Use **PJ** to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C (4) No quals for pH if samples preserved by lab upon receipt and within 1 day of collection.
Holding Time	All matrices: 180 days from date sampled Frozen soils, sediments, tissues (-20°C) - HT extended to 1 year	NFG (1) Method (2) EcoChem standard policy	J (pos)/UJ (ND) if holding time exceeded	1	
Instrument Performance					
Initial Calibration (ICAL)	Based on instrument requirements, blank + 1 standard minimum requirement for calibration If more than 1 standard used, r ≥ 0.995	NFG (1) Method (2)	J (pos)/UJ (ND) if r < 0.995	5A	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ± 10% of true value	NFG (1) Method (2)	R (pos/ND) if %R < 75% J (pos)/UJ (ND) if %R 75% - 89% J (pos) if %R >111%	5A (H,L)[3]	Qualify all samples in run
Reporting Limit (RL) Standard Low Level ICV/CCV	concentration at RL %R = 70%-130%	Method (2)	J (pos) < 2x RL / R (ND) if %R <50% J (pos) < 2x RL / UJ (ND) if %R 50 - 69% J (pos) < 2x RL if %R > 130%	5A (H,L)[3]	Qualify all samples in run
Continuing Calibration Verification (CCV)	Immediately following ICV/ICB, then every two hours or ten samples, and at end of run. %R within ± 10% of true value	NFG (1) Method (2)	R (pos/ND) if %R < 75% J (pos)/UJ (ND) if %R 75% - 89% J (pos) if %R >111%	5B (H,L)[3]	Qualify samples bracketed by CCV outliers
Interference Check Samples (ICSA / ICSAB)	ICSAB %R 80% - 120% for all spiked elements | ICSA | < MDL for all unspiked elements	NFG (1) Method (2)	For samples with Al, Ca, Fe, Mg > ICS levels: **ICSAB**: J(pos)/R (ND) if %R < 50% J (pos)/UJ (ND) if %R = 50% - 79% J (pos) if %R > 120% **ICSA:** J (pos)< 2x ICSA/UJ (ND) for ICSA <Neg MDL J (pos) < 2x ICSA for ICSA > MDL	17 (H,L)[3]	Use **PJ** and inter-element correction factors to evaluate ICSA to determine if bias is present. Refer to **TM-09** for additional information.

Metals by ICP-AES
(Based on Inorganic NFG 2010 and SW-846 6010C)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG (1) Method (2)	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blanks: 7 Neg Blanks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.
Precision and Accuracy					
LCS (recovery)	One per matrix per batch (of ≤ 20 samples); LCSD not required %R between 80-120%	Method (2)	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits. NFG Limits 70% -130% (50% - 150% Ab, Ag)
LCS/LCSD (RPD)	LCSD not required, if analyzed: RPD ≤ 20%	Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	Qualify all samples in batch QAPP may have overriding precision limits.
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples); MSD not required %R between 75-125%	NFG (1) Method (2)	J (pos) if %R > 125% J (pos)/UJ (ND) if %R <75% J (pos)/R (ND) if %R < 30%, unless post digestion spike analyzed, J (pos)/UJ (ND) if post digestion spike %R OK	8 (H,L)[3]	No action if only one spike %R is outside criteria. NA if parent concentration >4x the amount spiked. Qualify all samples in batch. QAPP may have overriding accuracy limits.

Metals by ICP-AES
(Based on Inorganic NFG 2010 and SW-846 6010C)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy con't					
Post Digestion Spikes	If MS is outside 75-125%, post-spike should be analyzed %R 80%-120% (method); 75%-125% (NFG)	NFG (1) Method (2)	Only used to support MS qualification decisions	NA	No qualifiers assigned based solely on this element.
MS/MSD (RPD)	MSD not required, if analyzed: RPD ≤ 20%	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	QAPP may have overriding precision limits.
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Serial Dilution	Analyze one sample per matrix at a 5x dilution %D <10% for original sample conc. > 50x MDL	NFG (1) Method (2)	J (pos)/UJ (ND) if %D > 10% and native sample concentration > 50x MDL	16	Qualify all samples in batch.
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.

Metals by ICP-AES
(Based on Inorganic NFG 2010 and SW-846 6010C)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Quantitation					
Total and Dissolved Comparison	Total > Dissolved	EcoChem standard policy	J (pos)/UJ (ND) if Dissolved > Total and results fall outside of standard duplicate precision criteria	14	
Calibration Range	Results < instrument linear range	NFG (1) Method (2)	J (pos) if result exceeds linear range and sample was not diluted	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] Method SW846 6010C Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES), Revision 3, February 2007.
[3] "H" = high bias indicated; "L" = low bias indicated
[4] SW846, Chapter 3, Inorganic Analytes

(pos): Positive Result
(ND): Not Detected

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler / Storage Temperature Preservation	**Solid:** Cooler temperature 4°C±2°C **Aqueous:** Nitric Acid to pH < 2 **Dissolved Metals:** 0.45 µm filter, preserve to pH < 2 after filtration	NFG (1) Method (2)	Cooler Temps: **If required by project** J (pos)/UJ (ND) if greater than 6° C Aqueous: J (pos)/UJ (ND) if pH > 2	1	Use **PJ** to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C (4) No quals for pH if samples preserved by lab immediately upon receipt and within 1 day of collection.
Holding Time	28 days from date sampled Frozen solids and tissues HT extended to 6 months	NFG (1) Method (2) EcoChem standard policy	J (pos)/UJ (ND) if HT exceeded	1	
Instrument Performance					
Initial Calibration (ICAL)	Daily Calibration Blank + 5 standards, one ≤ RL Correlation coefficient (r) ≥ 0.995	NFG (1) Method (2)	J (pos)/UJ (ND) if r < 0.995	5A (H,L)3	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after ICAL %R within ± 15% of true value	NFG (1) Method (2)	R(pos/ND) if %R <70% J(pos)/UJ(ND) if %R = 70-84% J(pos) if %R = > 116%	5A (H,L)3	Qualify all samples in run
Reporting Limit (RL) Standard	Conc = RL %R = 70-130%	Method (2)	J (pos) < 2x RL / R (ND) if %R <50% J (pos) < 2x RL / UJ (ND) if %R 50 - 69% J (pos) < 2x RL if %R > 130%	5A (H,L)3	Qualify all samples in run
Continuing Calibration Verification (CCV)	At beginning of run, every ten samples, and again after last sample. %R within ± 15% of true value	NFG (1) Method (2)	R(pos/ND) if %R <70% J(pos)/UJ(ND) if %R = 70-84% J(pos) if %R = > 116%	5B (H,L)3	Qualify samples bracketed by CCV outliers
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG (1) Method (2)	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blanks: 7 Neg Blanks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.
Precision and Accuracy					
Laboratroy Control Sample (recovery)	One per matrix per batch (of ≤ 20 samples); LCSD not required %R between 80-120%	Method (2)	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits. NFG does not address LCS
LCS/LCSD (RPD)	LCSD not required, if analyzed: RPD ≤ 20%	Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	Qualify all samples in batch QAPP may have overriding precision limits.
Matris Spike/Matrix Spike Duplicate MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples); MSD not required %R between 75-125%	NFG (1) Method (2)	J (pos) if %R > 125% J (pos)/UJ (ND) if %R <75% J (pos)/R (ND) if %R < 30%	8 (H,L)[3]	No action if only one spike %R is outside criteria. NA if parent concentration >4x the amount spiked. Qualify all samples in batch. QAPP may have overriding accuracy limits.
MS/MSD (RPD)	MSD not required, if analyzed: RPD ≤ 20%	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	QAPP may have overriding precision limits.
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Total and Dissolved Comparison	Total > Dissolved	EcoChem standard policy	J (pos)/UJ (ND) if Dissolved > Total and results fall outside of standard duplicate precision criteria	14	
Calibration Range	Results < instrument linear range	NFG (1) Method (2)	if result exceeds linear range and sample was not diluted J (pos)	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] Method SW846 7470A Mercury in Liquid Waste (Manual Cold-Vapor Technique), Revision 1, September 1994.
Method SW846 7471B Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique), Revision 2, February 2007.
[3] "H" = high bias indicated; "L" = low bias indicated
[4] SW846, Chapter 3, Inorganic Analytes

(pos): Positive Result
(ND): Not Detected

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Cooler temperature: 4°C±2°C Preservation: Analyte/Method Specific	NFG (1) Method (2)	J (pos)/UJ (ND) if preservation requirements not met	1	Use **PJ** to qualify for cooler temp outliers.
Holding Time	Analyte/Method Specific	NFG (1) Method (2)	J (pos)/UJ (ND) if holding time exceeded	1	
Instrument Performance					
Initial Calibration (ICAL)	blank + multiple standards as per method requirements $r \geq 0.995$	NFG (1) Method (2)	J (pos)/UJ (ND) for $r < 0.995$	5A	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R method specific	NFG (1) Method (2)	J (pos)/UJ (ND) if %R < lower control limit (LCL) J (pos) if %R > upper control limit (UCL)	5A (H,L)[3]	Qualify all samples in run
Continuing Calibration Verification (CCV)	Immediately following ICV, every 10 samples, and end of run %R method specific	NFG (1) Method (2)	J(pos)/UJ(ND) if %R < LCL J(pos) if %R > UCL	5B (H,L)[3]	Qualify samples bracketed by CCV outliers
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG [(1)] Method [(2)]	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blanks: 7 Neg Blanks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.
Precision and Accuracy					
Laboratory Control Sample (LCS)	One per matrix per batch (of ≤ 20 samples) %R within Method control limits (or Laboratory control limtis if none specified in method)	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) if %R < LCL J (pos) if %R > UCL	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits.
Reference Materials (RM, CRM, SRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Where applicable to method; MSD may not be required One per matrix per batch (of ≤ 20 samples) For samples <4x spike level, %R within method control limits (or Laboratory control limtis if none specified in method)	NFG (1) Method (2)	J (pos)/UJ (ND) if %R < LCL J (pos) if %R > UCL	8 (H,L)3	Qualify all samples in batch No action if native analyte concentration ≥ 4x spike added. Qualify all samples in batch. QAPP may have overriding accuracy limits.
Laboratory Duplicate (or MS/MSD)	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Linear Range	Sample concentrations less than highest calibration standard	NFG (1) Method (2)	If result exceeds linear range & sample was not diluted J (pos)	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] SW846 or EPA Standard Methods
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result
(ND): Not Detected

Conventional Analyses by Probe (i.e., pH, conductivity, dissolved oxygen)
(Based Inorganic NFG 2010 and EPA Methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Cooler temperature: 4°C±2°C Preservation: Analyte/Method Specific	NFG (1) Method (2)	J (pos)/UJ (ND) if preservation requirements not met	1	Use **PJ** to qualify for cooler temp outliers.
Holding Time	Analyte/Method Specific	NFG (1) Method (2)	J (pos)/UJ (ND) if holding time exceeded	1	
Instrument Performance/Accuracy					
Calibration	Where applicable to method porbe calibrated according to manufacturer specifications	NFG (1) Method (2)	J (pos)/UJ (ND) if not calibrated	5A	
Calibration Verification/ Laboratory Control Sample	Where applicable to method check standard analyzed to verifiy calibration of probe	NFG (1) Method (2)	J(D)/UJ(ND) if %R < LCL J(D) if %R > UCL	5B (H,L)[3]	H for high bias; L for low bias
Precision					
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	Method (1) NFG(2)	J (pos)/UJ (ND) if RPD > 20% or difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.

Conventional Analyses by Probe (i.e., pH, conductivity, dissolved oxygen)
(Based Inorganic NFG 2010 and EPA Methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Quantitation					
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported	11	na

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] SW846 or EPA Standard Methods
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result
(ND): Not Detected

Conventional Methods by Gravimetric Analysis
(i.e., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Cooler temperature: 4°C±2°C Preservation: Analyte/Method Specific	Method (1) NFG(2)	J (pos)/UJ (ND) if preservation requirements not met	1	Use **PJ** to qualify for cooler temp outliers.
Holding Time	Analyte/Method Specific	Method NFG(2)	J (pos)/UJ (ND) if holding time exceeded	1	
Blank Contamination					
Method Blank (MB)	If required by method,one per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994
Precision and Accuracy					
LCS (If appropriate to method)	One per matrix per batch (of ≤ 20 samples) %R between 80-120%	Method (2)	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)3	Qualify all samples in batch QAPP may have overriding accuracy limits.
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)3	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits

Conventional Methods by Gravimetric Analysis
(i.e., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20% For Grain Size, no action if results for fraction are less than 5%	9	Qualify all samples in batch, except Grain Size - qualify parent only. QAPP may have overriding precision limits.
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte per sample	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] SW846 or EPA Standard Methods
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result
(ND): Not Detected

ECOCHEM
Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801012	FW0002	E1801012-021	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	15.5	pg	JK	U	25
E1801012	SL0064	E1801012-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.758	ng/kg	JK	U	25
E1801012	SL0071	E1801012-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.01	ng/kg	JK	U	25
E1801012	SL0064	E1801012-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	6.65	ng/kg	K	U	25
E1801012	SL0058	E1801012-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	278	ng/kg	P	J	23
E1801012	SL0071	E1801012-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.15	ng/kg	JK	U	25
E1801012	FW0003	E1801012-022	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.46	pg	BJ	U	7
E1801012	FW0003	E1801012-022	EPA1613B	Octachlorodibenzofuran	100	pg	B	U	7
E1801020	FW0001	E1801020-053	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.56	pg	BJK	U	25
E1801020	FB0001	E1801020-054	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.72	pg	BJK	U	25
E1801020	FW0001	E1801020-053	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.41	pg	JK	U	25
E1801020	FB0001	E1801020-054	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	5.59	pg	JK	U	25
E1801020	SL0045	E1801020-006	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.09	ng/kg	JK	U	25
E1801020	SL0034	E1801020-051	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.21	ng/kg	JK	U	25
E1801020	FW0001	E1801020-053	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	5.26	pg	JK	U	25
E1801020	FB0001	E1801020-054	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.87	pg	JK	U	25
E1801020	SL0022	E1801020-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	105	ng/kg	P	J	23
E1801020	SL0046	E1801020-052	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.5	ng/kg	JK	U	25
E1801020	FW0001	E1801020-053	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	3.17	pg	JK	U	25
E1801020	SL0052	E1801020-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.411	ng/kg	BJK	U	25
E1801020	SL0011	E1801020-034	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.94	ng/kg	K	U	25
E1801020	SL0045	E1801020-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.314	ng/kg	BJ	U	7
E1801020	SL0052	E1801020-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.145	ng/kg	BJ	U	7
E1801020	SL0045	E1801020-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.384	ng/kg	JK	U	25
E1801020	SL0046	E1801020-052	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.69	ng/kg	JK	U	25
E1801020	SL0033	E1801020-045	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	498	ng/kg	P	J	23
E1801020	SL0046	E1801020-052	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	1.21	ng/kg	JK	U	25
E1801020	SL0052	E1801020-012	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.0866	ng/kg	JK	U	25
E1801020	SL0046	E1801020-052	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	1.24	ng/kg	JK	U	25
E1801020	SL0052	E1801020-012	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.651	ng/kg	JK	U	25
E1801020	SL0045	E1801020-006	EPA1613B	Octachlorodibenzo-p-dioxin	4600	ng/kg	E	J	20

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801020	SL0046	E1801020-052	EPA1613B	Octachlorodibenzo-p-dioxin	4870	ng/kg	E	J	20
E1801020	FW0001	E1801020-053	EPA1613B	Octachlorodibenzo-p-dioxin	10.5	pg	BJK	U	25
E1801020	FW0001	E1801020-053	EPA1613B	Octachlorodibenzofuran	82	pg	BJ	U	7
E1801020	FB0001	E1801020-054	EPA1613B	Octachlorodibenzofuran	89.9	pg	BJ	U	7
E1801035	SL0078	E1801035-017	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	22.3	ng/kg		J	13L
E1801035	SL0078	E1801035-017	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.31	ng/kg	J	J	13L
E1801035	SL0084	E1801035-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.506	ng/kg	JK	U	25
E1801035	SL0078	E1801035-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.772	ng/kg	JK	U	25
E1801035	SL0078	E1801035-017	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.04	ng/kg	JK	U	25
E1801035	SL0078	E1801035-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	1.53	ng/kg	JK	U	25
E1801035	SL0078	E1801035-017	EPA1613B	Octachlorodibenzo-p-dioxin	2060	ng/kg		J	13L
E1801039	FW0004	E1801039-041	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.04	pg	BJK	U	25
E1801039	SL0130	E1801039-037	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	189	ng/kg		J	13L
E1801039	FW0005	E1801039-039	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.29	pg	JK	U	25
E1801039	SL0129	E1801039-036	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	14.6	ng/kg		J	13L
E1801039	SL0130	E1801039-037	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	30.2	ng/kg		J	13L
E1801039	FW0006	E1801039-040	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.59	pg	JK	U	25
E1801039	FW0004	E1801039-041	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.71	pg	JK	U	25
E1801039	FW0004	E1801039-041	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.68	pg	JK	U	25
E1801039	SL0101	E1801039-038	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.14	ng/kg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.62	ng/kg	JK	U	25
E1801039	SL0100	E1801039-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	2.82	ng/kg	JK	U	25
E1801039	SL0107	E1801039-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.509	ng/kg	JK	U	25
E1801039	SL0129	E1801039-036	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	23.6	ng/kg	P	J	23
E1801039	SL0101	E1801039-038	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	2.45	ng/kg	JK	U	25
E1801039	FW0005	E1801039-039	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.31	pg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.47	ng/kg	JK	U	25
E1801039	SL0100	E1801039-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.56	ng/kg	JK	U	25
E1801039	SL0108	E1801039-031	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.21	ng/kg	JK	U	25
E1801039	SL0101	E1801039-038	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.814	ng/kg	JK	U	25
E1801039	SL0100	E1801039-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	1.07	ng/kg	JK	U	25

Qualified Data Summary Table

San Jacinto Waste Pits

South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801039	SL0107	E1801039-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.537	ng/kg	JK	U	25
E1801039	SL0108	E1801039-031	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.561	ng/kg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.16	ng/kg	JK	U	25
E1801039	SL0101	E1801039-038	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.09	ng/kg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.276	ng/kg	BJK	U	25
E1801039	SL0108	E1801039-031	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.357	ng/kg	JK	U	25
E1801039	FW0006	E1801039-040	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	2.17	pg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.857	ng/kg	JK	U	25
E1801039	SL0107	E1801039-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.543	ng/kg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.151	ng/kg	JK	U	25
E1801039	SL0107	E1801039-017	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	1.06	ng/kg	JK	U	25
E1801039	Comp-SL0119-0123	E1801039-042	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.811	ng/kg	JK	U	25
E1801039	SL0129	E1801039-036	EPA1613B	Octachlorodibenzo-p-dioxin	65300	ng/kg		J	13L
E1801039	SL0130	E1801039-037	EPA1613B	Octachlorodibenzo-p-dioxin	87000	ng/kg		J	13L
E1801039	FW0005	E1801039-039	EPA1613B	Octachlorodibenzo-p-dioxin	8.24	pg	BJK	U	25
E1801039	FW0006	E1801039-040	EPA1613B	Octachlorodibenzo-p-dioxin	9.88	pg	BJK	U	25
E1801039	SL0129	E1801039-036	EPA1613B	Octachlorodibenzofuran	2650	ng/kg		J	13L
E1801039	SL0130	E1801039-037	EPA1613B	Octachlorodibenzofuran	3420	ng/kg		j	13L
E1801039	FW0005	E1801039-039	EPA1613B	Octachlorodibenzofuran	75.3	pg	BJ	U	7
E1801039	FW0006	E1801039-040	EPA1613B	Octachlorodibenzofuran	64.3	pg	BJK	U	25
E1801039	FW0004	E1801039-041	EPA1613B	Octachlorodibenzofuran	59.2	pg	BJK	U	25
E1801045	SL0146	E1801045-023	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.15	ng/kg	JK	U	25
E1801045	SL0164	E1801045-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2.32	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.77	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.796	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.403	ng/kg	JK	U	25
E1801045	SL0164	E1801045-017	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.935	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	1.11	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.867	ng/kg	JK	U	25
E1801045	SL0153	E1801045-006	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	8.6	ng/kg	K	U	25
E1801045	SL0146	E1801045-023	EPA1613B	Octachlorodibenzo-p-dioxin	14500	ng/kg	E	J	20
E1801056	SL0197	E1801056-012	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	37.4	ng/kg		J	13L

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801056	SL0197	E1801056-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.841	ng/kg	JK	U	25
E1801056	SL0203	E1801056-039	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.731	ng/kg	JK	U	25
E1801056	SL0221	E1801056-057	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.82	ng/kg	JK	U	25
E1801056	SL0221	E1801056-057	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	6.96	ng/kg	K	U	25
E1801056	SL0175	E1801056-023	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.52	ng/kg	K	U	25
E1801056	SL0203	E1801056-039	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.75	ng/kg	JK	U	25
E1801056	SL0204	E1801056-040	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.961	ng/kg	JK	U	25
E1801056	SL0227	E1801056-063	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.28	ng/kg	K	U	25
E1801056	SL0197	E1801056-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	2.18	ng/kg	JK	U	25
E1801056	SL0197	E1801056-012	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2.6	ng/kg	JK	U	25
E1801056	SL0204	E1801056-040	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	7.99	ng/kg	K	U	25
E1801056	SL0197	E1801056-012	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	2.2	ng/kg	JK	U	25
E1801056	SL0197	E1801056-012	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	199	ng/kg		J	13L
E1801056	FW0007	E1801056-069	EPA1613B	Octachlorodibenzo-p-dioxin	25	pg	BJK	U	25
E1801058	FW0008	E1801058-030	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.55	pg	BJK	U	25
E1801058	FW0010	E1801058-032	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.16	pg	BJK	U	25
E1801058	FW0008	E1801058-030	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.39	pg	JK	U	25
E1801058	FW0010	E1801058-032	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.58	pg	JK	U	25
E1801058	SL0243	E1801058-011	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.434	ng/kg	JK	U	25
E1801058	SL0250	E1801058-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.764	ng/kg	JK	U	25
E1801058	SL0250	E1801058-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.93	ng/kg	JK	U	25
E1801058	SL0256	E1801058-024	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.287	ng/kg	JK	U	25
E1801058	SL0243	E1801058-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.804	ng/kg	JK	U	25
E1801058	SL0243	E1801058-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.669	ng/kg	JK	U	25
E1801058	SL0249	E1801058-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.04	ng/kg	JK	U	25
E1801058	SL0256	E1801058-024	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.277	ng/kg	JK	U	25
E1801058	SL0243	E1801058-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.219	ng/kg	BJK	U	25
E1801058	SL0256	E1801058-024	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.01	ng/kg	JK	U	25
E1801058	SL0243	E1801058-011	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.897	ng/kg	JK	U	25
E1801058	FW0008	E1801058-030	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	18.9	pg	U	UJ	13L
E1801058	FW0009	E1801058-031	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	7.92	pg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801058	FW0010	E1801058-032	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	11.4	pg	K	U	25
E1801058	FW0008	E1801058-030	EPA1613B	Octachlorodibenzo-p-dioxin	36.3	pg	BJK	U	25
E1801058	FW0010	E1801058-032	EPA1613B	Octachlorodibenzo-p-dioxin	60.7	pg	BJK	U	25
E1801058	FW0010	E1801058-032	EPA1613B	Octachlorodibenzofuran	6.41	pg	JK	U	25
E1801093	SL0001	E1801093-016	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	257	ng/kg		J	13L
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.85	ng/kg	K	U	25
E1801093	SL0017	E1801093-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.83	ng/kg	JK	U	25
E1801093	SL0024	E1801093-007	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	20.4	ng/kg	K	U	25
E1801093	SL0006	E1801093-011	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.19	ng/kg	JK	U	25
E1801093	SL0001	E1801093-016	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	38.1	ng/kg		J	13L
E1801093	SL0002	E1801093-017	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.367	ng/kg	JK	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.258	ng/kg	JK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.214	ng/kg	JK	U	25
E1801093	SL0019	E1801093-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.941	ng/kg	JK	U	25
E1801093	SL0021	E1801093-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.218	ng/kg	JK	U	25
E1801093	SL0023	E1801093-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.97	ng/kg	JK	U	25
E1801093	SL0027	E1801093-010	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.348	ng/kg	JK	U	25
E1801093	SL0008	E1801093-013	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	5.61	ng/kg	K	U	25
E1801093	SL0010	E1801093-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.54	ng/kg	JK	U	25
E1801093	SL0002	E1801093-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.731	ng/kg	JK	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.483	ng/kg	JK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.346	ng/kg	JK	U	25
E1801093	SL0026	E1801093-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	664	ng/kg	P	J	23
E1801093	SL0002	E1801093-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	1.54	ng/kg	JK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.26	ng/kg	JK	U	25
E1801093	SL0019	E1801093-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	4.77	ng/kg	K	U	25
E1801093	SL0021	E1801093-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.501	ng/kg	BJK	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.66	ng/kg	JK	U	25
E1801093	SL0004	E1801093-019	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.29	ng/kg	JK	U	25
E1801093	SL0017	E1801093-001	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	2.04	ng/kg	JK	U	25
E1801093	SL0021	E1801093-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.822	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801093	SL0023	E1801093-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.14	ng/kg	JK	U	25
E1801093	SL0024	E1801093-007	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	26.9	ng/kg	P	J	23
E1801093	SL0027	E1801093-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.63	ng/kg	JK	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.246	ng/kg	BJK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.444	ng/kg	BJK	U	25
E1801093	SL0019	E1801093-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.36	ng/kg	JK	U	25
E1801093	SL0021	E1801093-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.634	ng/kg	JK	U	25
E1801093	SL0017	E1801093-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.78	ng/kg	JK	U	25
E1801093	SL0018	E1801093-002	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	2.03	ng/kg	JK	U	25
E1801093	SL0021	E1801093-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.328	ng/kg	BJK	U	25
E1801093	SL0023	E1801093-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.436	ng/kg	JK	U	25
E1801093	SL0006	E1801093-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.31	ng/kg	BJK	U	25
E1801093	SL0007	E1801093-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	6.6	ng/kg	JK	U	25
E1801093	SL0001	E1801093-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	17.5	ng/kg	K	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.152	ng/kg	BJK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.204	ng/kg	BJK	U	25
E1801093	SL0023	E1801093-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.555	ng/kg	JK	U	25
E1801093	SL0024	E1801093-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	6.79	ng/kg	K	U	25
E1801093	SL0009	E1801093-014	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	5.37	ng/kg	K	U	25
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.464	ng/kg	JK	U	25
E1801093	SL0004	E1801093-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.51	ng/kg	JK	U	25
E1801093	SL0018	E1801093-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	3.07	ng/kg	JK	U	25
E1801093	SL0023	E1801093-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.915	ng/kg	JK	U	25
E1801093	SL0024	E1801093-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	11.8	ng/kg	P	J	23
E1801093	SL0003	E1801093-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.317	ng/kg	JK	U	25
E1801093	SL0021	E1801093-005	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.234	ng/kg	JK	U	25
E1801093	SL0002	E1801093-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.361	ng/kg	JK	U	25
E1801093	SL0004	E1801093-019	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	1.72	ng/kg	JK	U	25
E1801093	SL0005	E1801093-020	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.139	ng/kg	JK	U	25
E1801093	SL0017	E1801093-001	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.733	ng/kg	JK	U	25
E1801093	SL0008	E1801093-013	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	4960	ng/kg	K,D	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801093	SL0018	E1801093-002	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	3.35	ng/kg	K	U	25
E1801093	SL0002	E1801093-017	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	17.9	ng/kg	K	U	25
E1801093	SL0017	E1801093-001	EPA1613B	Octachlorodibenzo-p-dioxin	4840	ng/kg	E	J	20
E1801093	SL0018	E1801093-002	EPA1613B	Octachlorodibenzo-p-dioxin	25500	ng/kg	E	J	20
E1801093	SL0024	E1801093-007	EPA1613B	Octachlorodibenzo-p-dioxin	29900	ng/kg	E	J	20
E1801093	SL0025	E1801093-008	EPA1613B	Octachlorodibenzo-p-dioxin	31700	ng/kg	E	J	20
E1801093	SL0001	E1801093-016	EPA1613B	Octachlorodibenzo-p-dioxin	111000	ng/kg	D	J	13L
E1801093	SL0001	E1801093-016	EPA1613B	Octachlorodibenzofuran	680	ng/kg		J	13L
E1801093	SL0002	E1801093-017	EPA1613B	Octachlorodibenzofuran	2.73	ng/kg	JK	U	25
E1801093	SL0003	E1801093-018	EPA1613B	Octachlorodibenzofuran	1.29	ng/kg	BJK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	893	ng/kg		J	13L
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	16.7	ng/kg		J	13L
E1801094	SL0032	E1801094-005	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.551	ng/kg	BJK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	249	ng/kg		J	13L
E1801094	SL0037	E1801094-008	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.456	ng/kg	BJ	U	7
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.265	ng/kg	BJK	UJ	13L,25
E1801094	SL0015	E1801094-019	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.25	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	17.4	ng/kg		J	13L
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0054	E1801094-012	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	25.8	ng/kg	K	U	25
E1801094	SL0055	E1801094-013	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.58	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	25.2	ng/kg		J	13L
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.534	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.295	ng/kg	JK	UJ	13L,25
E1801094	SL0055	E1801094-013	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	5.84	ng/kg	K	U	25
E1801094	SL0057	E1801094-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.75	ng/kg	JK	U	25
E1801094	SL0012	E1801094-016	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.41	ng/kg	JK	U	25
E1801094	SL0013	E1801094-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.88	ng/kg	K	U	25
E1801094	SL0014	E1801094-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	10.1	ng/kg	K	U	25
E1801094	SL0032	E1801094-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	1.29	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	25.1	ng/kg		J	13L

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801094	SL0037	E1801094-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.122	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0015	E1801094-019	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	1.24	ng/kg	JK	U	25
E1801094	SL0016	E1801094-020	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.424	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	50	ng/kg		J	13L
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.864	ng/kg	J	J	13L
E1801094	SL0039	E1801094-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.692	ng/kg	JK	U	25
E1801094	SL0057	E1801094-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	26.6	ng/kg	K	U	25
E1801094	SL0015	E1801094-019	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.782	ng/kg	JK	U	25
E1801094	SL0028	E1801094-001	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	12.5	ng/kg	P	J	23
E1801094	SL0032	E1801094-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.433	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	42.5	ng/kg	P	J	13L,23
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.797	ng/kg	JK	U	25
E1801094	SL0037	E1801094-008	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.169	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0053	E1801094-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.51	ng/kg	JK	U	25
E1801094	SL0054	E1801094-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	43.3	ng/kg	P	J	23
E1801094	SL0055	E1801094-013	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	17.1	ng/kg	P	J	23
E1801094	SL0057	E1801094-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	223	ng/kg	P	J	23
E1801094	SL0014	E1801094-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	111	ng/kg	P	J	23
E1801094	SL0032	E1801094-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.43	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19.4	ng/kg	K	UJ	13L,25
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.7	ng/kg	JK	U	25
E1801094	SL0037	E1801094-008	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.492	ng/kg	BJK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.943	ng/kg	BJ	J	13L
E1801094	SL0053	E1801094-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.61	ng/kg	JK	U	25
E1801094	SL0057	E1801094-015	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	10.8	ng/kg	K	U	25
E1801094	SL0015	E1801094-019	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.53	ng/kg	JK	U	25
E1801094	SL0028	E1801094-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	2.32	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	3.72	ng/kg	U	UJ	13L
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.191	ng/kg	BJK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample ID	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0012	E1801094-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.536	ng/kg	BJK	U	25
E1801094	SL0028	E1801094-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	4.69	ng/kg	K	U	25
E1801094	SL0032	E1801094-005	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.257	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	6.55	ng/kg		J	13L
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.574	ng/kg	JK	U	25
E1801094	SL0037	E1801094-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.344	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2.84	ng/kg	U	UJ	13L
E1801094	SL0039	E1801094-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.519	ng/kg	JK	U	25
E1801094	SL0053	E1801094-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.04	ng/kg	JK	U	25
E1801094	SL0054	E1801094-012	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	12.1	ng/kg	K	U	25
E1801094	SL0055	E1801094-013	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.994	ng/kg	JK	U	25
E1801094	SL0012	E1801094-016	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.486	ng/kg	JK	U	25
E1801094	SL0029	E1801094-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	1110	ng/kg	P	J	23
E1801094	SL0035	E1801094-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	7.6	ng/kg		J	13L
E1801094	SL0036	E1801094-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.678	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0039	E1801094-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.419	ng/kg	JK	U	25
E1801094	SL0053	E1801094-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.808	ng/kg	JK	U	25
E1801094	SL0015	E1801094-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.773	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	26.2	ng/kg		J	13L
E1801094	SL0036	E1801094-007	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.71	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0053	E1801094-011	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	2.58	ng/kg	JK	U	25
E1801094	SL0032	E1801094-005	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.609	ng/kg	JK	U	25
E1801094	SL0035	E1801094-006	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	10.9	ng/kg	K	UJ	13L,25
E1801094	SL0036	E1801094-007	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	1.25	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	2.84	ng/kg	U	UJ	13L
E1801094	SL0039	E1801094-010	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.351	ng/kg	JK	U	25
E1801094	SL0056	E1801094-014	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	7730	ng/kg	K	U	25
E1801094	SL0015	E1801094-019	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.376	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801094	SL0028	E1801094-001	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	3.33	ng/kg	K	U	25
E1801094	SL0035	E1801094-006	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	18.4	ng/kg		J	13L
E1801094	SL0037	E1801094-008	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.98	ng/kg	K	U	25
E1801094	SL0038	E1801094-009	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.38	ng/kg	U	UJ	13L
E1801094	SL0039	E1801094-010	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.962	ng/kg	K	U	25
E1801094	SL0053	E1801094-011	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	4.27	ng/kg	K	U	25
E1801094	SL0031	E1801094-004	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	1550	ng/kg	K	U	25
E1801094	SL0035	E1801094-006	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	45.3	ng/kg		J	13L
E1801094	SL0038	E1801094-009	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	3.79	ng/kg		J	13L
E1801094	SL0053	E1801094-011	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	11.4	ng/kg	K	U	25
E1801094	SL0028	E1801094-001	EPA1613B	Octachlorodibenzo-p-dioxin	28200	ng/kg	E	J	20
E1801094	SL0035	E1801094-006	EPA1613B	Octachlorodibenzo-p-dioxin	15600	ng/kg	E	J	13L,20
E1801094	SL0038	E1801094-009	EPA1613B	Octachlorodibenzo-p-dioxin	459	ng/kg		J	13L
E1801094	SL0055	E1801094-013	EPA1613B	Octachlorodibenzo-p-dioxin	19200	ng/kg	E	J	20
E1801094	SL0056	E1801094-014	EPA1613B	Octachlorodibenzo-p-dioxin	279000	ng/kg		J	13L
E1801094	SL0013	E1801094-017	EPA1613B	Octachlorodibenzo-p-dioxin	53600	ng/kg	E	J	20
E1801094	SL0035	E1801094-006	EPA1613B	Octachlorodibenzofuran	355	ng/kg		J	13L
E1801094	SL0036	E1801094-007	EPA1613B	Octachlorodibenzofuran	11.9	ng/kg	K	U	25
E1801094	SL0037	E1801094-008	EPA1613B	Octachlorodibenzofuran	0.93	ng/kg	JK	U	25
E1801094	SL0038	E1801094-009	EPA1613B	Octachlorodibenzofuran	5.68	ng/kg	U	UJ	13L
E1801094	SL0056	E1801094-014	EPA1613B	Octachlorodibenzofuran	2020	ng/kg		J	13L
E1801094	SL0015	E1801094-019	EPA1613B	Octachlorodibenzofuran	4.13	ng/kg	JK	U	25
E1801096	SL0060	E1801096-002	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	56	ng/kg	P	J	23
E1801096	SL0063	E1801096-005	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.48	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.554	ng/kg	JK	U	25
E1801096	SL0059	E1801096-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.922	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0715	ng/kg	JK	U	25
E1801096	SL0066	E1801096-011	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	28.4	ng/kg	K	U	25
E1801096	SL0233	E1801096-016	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.71	ng/kg	JK	U	25
E1801096	SL0060	E1801096-002	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.771	ng/kg	JK	U	25
E1801096	SL0063	E1801096-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.402	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801096	SL0066	E1801096-011	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.754	ng/kg	JK	U	25
E1801096	SL0067	E1801096-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.01	ng/kg	JK	U	25
E1801096	SL0069	E1801096-014	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.94	ng/kg	JK	U	25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.53	ng/kg	JK	U	25
E1801096	SL0235	E1801096-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.775	ng/kg	JK	U	25
E1801096	SL0236	E1801096-019	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.522	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.258	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.243	ng/kg	JK	U	25
E1801096	SL0210	E1801096-010	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.229	ng/kg	JK	U	25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.526	ng/kg	JK	U	25
E1801096	SL0063	E1801096-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.906	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.621	ng/kg	JK	U	25
E1801096	SL0067	E1801096-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	5.69	ng/kg	K	U	25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.06	ng/kg	JK	U	25
E1801096	SL0234	E1801096-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.59	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.558	ng/kg	JK	U	25
E1801096	SL0062	E1801096-004	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	13.7	ng/kg	P	J	23
E1801096	SL0206	E1801096-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.23	ng/kg	JKP	UJ	23,25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.176	ng/kg	JK	U	25
E1801096	SL0233	E1801096-016	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	2.88	ng/kg	JP	J	23
E1801096	SL0235	E1801096-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.353	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.215	ng/kg	JK	U	25
E1801096	SL0209	E1801096-009	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.21	ng/kg	JK	U	25
E1801096	SL0210	E1801096-010	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.58	ng/kg	JK	U	25
E1801096	SL0066	E1801096-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.06	ng/kg	K	U	25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.44	ng/kg	JK	U	25
E1801096	SL0235	E1801096-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.51	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.799	ng/kg	JK	U	25
E1801096	SL0206	E1801096-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.406	ng/kg	JK	U	25
E1801096	SL0233	E1801096-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.699	ng/kg	JK	U	25
E1801096	SL0235	E1801096-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.203	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801096	SL0059	E1801096-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.965	ng/kg	JK	U	25
E1801096	SL0063	E1801096-005	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.625	ng/kg	JK	U	25
E1801096	SL0206	E1801096-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.09	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.373	ng/kg	JK	U	25
E1801096	SL0209	E1801096-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.542	ng/kg	JK	U	25
E1801096	SL0070	E1801096-015	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.353	ng/kg	JK	U	25
E1801096	SL0235	E1801096-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.685	ng/kg	JK	U	25
E1801096	SL0236	E1801096-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.576	ng/kg	JK	U	25
E1801096	SL0237	E1801096-020	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.346	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.246	ng/kg	JK	U	25
E1801096	SL0236	E1801096-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.396	ng/kg	JK	U	25
E1801096	SL0059	E1801096-001	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.729	ng/kg	JK	U	25
E1801096	SL0063	E1801096-005	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.201	ng/kg	JK	U	25
E1801096	SL0067	E1801096-012	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	46	ng/kg	K	U	25
E1801096	SL0235	E1801096-018	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.129	ng/kg	JK	U	25
E1801096	SL0236	E1801096-019	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.168	ng/kg	JK	U	25
E1801096	SL0208	E1801096-008	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.151	ng/kg	JK	U	25
E1801096	SL0235	E1801096-018	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.603	ng/kg	JK	U	25
E1801096	SL0210	E1801096-010	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	3.01	ng/kg	K	U	25
E1801096	SL0237	E1801096-020	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	8.81	ng/kg		J	13L
E1801096	SL0237	E1801096-020	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	14.4	ng/kg	K	U	25
E1801096	SL0059	E1801096-001	EPA1613B	Octachlorodibenzo-p-dioxin	9120	ng/kg	E	J	20
E1801096	SL0206	E1801096-006	EPA1613B	Octachlorodibenzo-p-dioxin	16300	ng/kg	E	J	20
E1801096	SL0208	E1801096-008	EPA1613B	Octachlorodibenzofuran	0.716	ng/kg	JK	U	25
E1801096	SL0236	E1801096-019	EPA1613B	Octachlorodibenzofuran	5.55	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.38	ng/kg	JP	J	23
E1801136	SL0083	E1801136-005	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.479	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.751	ng/kg	JK	U	25
E1801136	SL0117	E1801136-012	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.405	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.181	ng/kg	JK	U	25
E1801136	SL0141	E1801136-018	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.6	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801136	SL0081	E1801136-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.25	ng/kg	JK	U	25
E1801136	SL0083	E1801136-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.21	ng/kg	JK	U	25
E1801136	SL0085	E1801136-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.48	ng/kg	JK	U	25
E1801136	SL0086	E1801136-007	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.331	ng/kg	JK	U	25
E1801136	SL0087	E1801136-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.523	ng/kg	JK	U	25
E1801136	SL0088	E1801136-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.293	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.439	ng/kg	JK	U	25
E1801136	SL0124	E1801136-014	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.72	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.47	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.75	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.141	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.184	ng/kg	JK	U	25
E1801136	SL0141	E1801136-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.618	ng/kg	JK	U	25
E1801136	SL0079	E1801136-001	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.05	ng/kg	JK	U	25
E1801136	SL0083	E1801136-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.474	ng/kg	JK	U	25
E1801136	SL0088	E1801136-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.12	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.659	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.2	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.355	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.901	ng/kg	JK	U	25
E1801136	SL0083	E1801136-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.61	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.839	ng/kg	JK	U	25
E1801136	SL0117	E1801136-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.276	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.107	ng/kg	JK	U	25
E1801136	SL0124	E1801136-014	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.757	ng/kg	JP	J	23
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.271	ng/kg	JK	U	25
E1801136	SL0141	E1801136-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.547	ng/kg	JK	U	25
E1801136	SL0142	E1801136-019	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.23	ng/kg	JP	J	23
E1801136	SL0143	E1801136-020	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	3.9	ng/kg	JP	J	23
E1801136	SL0087	E1801136-008	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.92	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.804	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.32	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.775	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.33	ng/kg	JK	U	25
E1801136	SL0085	E1801136-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.525	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.306	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.598	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.117	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.138	ng/kg	JK	U	25
E1801136	SL0089	E1801136-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.547	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.12	ng/kg	JK	U	25
E1801136	SL0117	E1801136-012	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.136	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.235	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.635	ng/kg	JK	U	25
E1801136	SL0142	E1801136-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.707	ng/kg	JK	U	25
E1801136	SL0143	E1801136-020	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2	ng/kg	JK	U	25
E1801136	SL0141	E1801136-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.269	ng/kg	JK	U	25
E1801136	SL0142	E1801136-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.494	ng/kg	JK	U	25
E1801136	SL0083	E1801136-005	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.424	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.372	ng/kg	JK	U	25
E1801136	SL0118	E1801136-013	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.102	ng/kg	JK	U	25
E1801136	SL0124	E1801136-014	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.866	ng/kg	JK	U	25
E1801136	SL0128	E1801136-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.197	ng/kg	JK	U	25
E1801136	SL0141	E1801136-018	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.691	ng/kg	JK	U	25
E1801136	SL0085	E1801136-006	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	2.28	ng/kg	JK	U	25
E1801136	SL0116	E1801136-011	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	3.41	ng/kg	K	U	25
E1801136	SL0124	E1801136-014	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.429	ng/kg	JK	U	25
E1801136	SL0124	E1801136-014	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.696	ng/kg	K	U	25
E1801136	SL0141	E1801136-018	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.27	ng/kg	K	U	25
E1801136	SL0124	E1801136-014	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	1.01	ng/kg	K	U	25
E1801136	SL0085	E1801136-006	EPA1613B	Octachlorodibenzo-p-dioxin	4850	ng/kg	E	J	20
E1801136	SL0124	E1801136-014	EPA1613B	Octachlorodibenzo-p-dioxin	41500	ng/kg	E	J	20

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801136	SL0141	E1801136-018	EPA1613B	Octachlorodibenzo-p-dioxin	72700	ng/kg	E	J	20
E1801136	SL0143	E1801136-020	EPA1613B	Octachlorodibenzo-p-dioxin	7360	ng/kg	E	J	20
E1801136	SL0089	E1801136-010	EPA1613B	Octachlorodibenzofuran	1.84	ng/kg	JK	U	25
E1801137	SL0138	E1801137-005	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	62	ng/kg		J	13L
E1801137	SL0139	E1801137-006	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	592	ng/kg		J	13L
E1801137	SL0190	E1801137-017	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.398	ng/kg	BJK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.01	ng/kg	JK	U	25
E1801137	SL0138	E1801137-005	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	4.18	ng/kg	K	UJ	13L,25
E1801137	SL0139	E1801137-006	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	141	ng/kg		J	13L
E1801137	SL0140	E1801137-007	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	80.9	ng/kg		J	13L
E1801137	SL0186	E1801137-013	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.941	ng/kg	JK	U	25
E1801137	SL0193	E1801137-019	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.65	ng/kg	JK	U	25
E1801137	SL0144	E1801137-001	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	4.42	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.24	ng/kg	JK	U	25
E1801137	SL0137	E1801137-004	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.14	ng/kg	JK	U	25
E1801137	SL0138	E1801137-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.69	ng/kg	JK	U	25
E1801137	SL0131	E1801137-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.39	ng/kg	JK	U	25
E1801137	SL0132	E1801137-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.418	ng/kg	JK	U	25
E1801137	SL0134	E1801137-011	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.259	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.325	ng/kg	JK	U	25
E1801137	SL0188	E1801137-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.75	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.538	ng/kg	JK	U	25
E1801137	SL0194	E1801137-020	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.43	ng/kg	JK	U	25
E1801137	SL0137	E1801137-004	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.14	ng/kg	JK	U	25
E1801137	SL0131	E1801137-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.119	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.398	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2.66	ng/kg	JK	U	25
E1801137	SL0134	E1801137-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.533	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.493	ng/kg	JK	U	25
E1801137	SL0193	E1801137-019	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2.83	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.927	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801137	SL0138	E1801137-005	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	5.82	ng/kg	K	U	25
E1801137	SL0131	E1801137-008	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.198	ng/kg	JK	U	25
E1801137	SL0132	E1801137-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.266	ng/kg	JK	U	25
E1801137	SL0133	E1801137-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	308	ng/kg	P	J	23
E1801137	SL0187	E1801137-014	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.09	ng/kg	JK	U	25
E1801137	SL0190	E1801137-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.328	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.23	ng/kg	JK	U	25
E1801137	SL0144	E1801137-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	10.4	ng/kg	K	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.09	ng/kg	JK	U	25
E1801137	SL0134	E1801137-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.581	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.582	ng/kg	JK	U	25
E1801137	SL0189	E1801137-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	4.56	ng/kg	K	U	25
E1801137	SL0190	E1801137-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.755	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.382	ng/kg	JK	U	25
E1801137	SL0134	E1801137-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.488	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.441	ng/kg	JK	U	25
E1801137	SL0187	E1801137-014	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.445	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.502	ng/kg	JK	U	25
E1801137	SL0194	E1801137-020	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.905	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.01	ng/kg	JK	U	25
E1801137	SL0137	E1801137-004	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.09	ng/kg	JK	U	25
E1801137	SL0138	E1801137-005	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.71	ng/kg	JK	U	25
E1801137	SL0131	E1801137-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.861	ng/kg	JK	U	25
E1801137	SL0132	E1801137-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.305	ng/kg	JK	U	25
E1801137	SL0187	E1801137-014	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.794	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.605	ng/kg	JK	U	25
E1801137	SL0193	E1801137-019	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.931	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.423	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	1.91	ng/kg	JK	U	25
E1801137	SL0136	E1801137-003	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	1.17	ng/kg	JK	U	25
E1801137	SL0135	E1801137-012	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.292	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801137	SL0186	E1801137-013	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.944	ng/kg	JK	U	25
E1801137	SL0192	E1801137-018	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.703	ng/kg	JK	U	25
E1801137	SL0137	E1801137-004	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.909	ng/kg	JK	U	25
E1801137	SL0131	E1801137-008	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.235	ng/kg	JK	U	25
E1801137	SL0190	E1801137-017	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.418	ng/kg	JK	U	25
E1801137	SL0138	E1801137-005	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	25	ng/kg	K	U	25
E1801137	SL0132	E1801137-009	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.798	ng/kg	K	U	25
E1801137	SL0190	E1801137-017	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	7.95	ng/kg		J	13L
E1801137	SL0137	E1801137-004	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	4.8	ng/kg	K	U	25
E1801137	SL0138	E1801137-005	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	45.9	ng/kg	K	U	25
E1801137	SL0190	E1801137-017	EPA1613B	2,3,7,8-Tetrachlorodibenzofuran	15.7	ng/kg		J	13L
E1801137	SL0144	E1801137-001	EPA1613B	Octachlorodibenzo-p-dioxin	32700	ng/kg		J	13L
E1801137	SL0136	E1801137-003	EPA1613B	Octachlorodibenzo-p-dioxin	22700	ng/kg	E	J	20
E1801137	SL0138	E1801137-005	EPA1613B	Octachlorodibenzo-p-dioxin	3990	ng/kg		J	13L
E1801137	SL0139	E1801137-006	EPA1613B	Octachlorodibenzo-p-dioxin	26900	ng/kg		J	13L
E1801137	SL0140	E1801137-007	EPA1613B	Octachlorodibenzo-p-dioxin	20000	ng/kg		J	13L
E1801137	SL0131	E1801137-008	EPA1613B	Octachlorodibenzo-p-dioxin	32700	ng/kg	E	J	20
E1801137	SL0144	E1801137-001	EPA1613B	Octachlorodibenzofuran	30100	ng/kg		J	13L
E1801137	SL0138	E1801137-005	EPA1613B	Octachlorodibenzofuran	109	ng/kg		J	13L
E1801137	SL0139	E1801137-006	EPA1613B	Octachlorodibenzofuran	943	ng/kg		J	13L
E1801137	SL0140	E1801137-007	EPA1613B	Octachlorodibenzofuran	23200	ng/kg		J	13L
E1801137	SL0190	E1801137-017	EPA1613B	Octachlorodibenzofuran	0.985	ng/kg	JK	U	25
E1801138	SL0171	E1801138-004	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.89	ng/kg	K	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	9.44	ng/kg	K	U	25
E1801138	SL0195	E1801138-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.93	ng/kg	JK	U	25
E1801138	SL0171	E1801138-004	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.436	ng/kg	JK	U	25
E1801138	SL0172	E1801138-005	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.96	ng/kg	K	U	25
E1801138	SL0195	E1801138-001	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.11	ng/kg	JK	U	25
E1801138	SL0172	E1801138-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.26	ng/kg	JK	U	25
E1801138	SL0173	E1801138-006	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.33	ng/kg	JK	U	25
E1801138	SL0176	E1801138-008	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.11	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.698	ng/kg	JK	U	25
E1801138	SL0180	E1801138-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.6	ng/kg	JK	U	25
E1801138	SL0201	E1801138-016	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.319	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	2.33	ng/kg	JK	U	25
E1801138	SL0201	E1801138-016	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.558	ng/kg	BJK	U	25
E1801138	SL0202	E1801138-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.391	ng/kg	BJK	U	25
E1801138	SL0170	E1801138-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.93	ng/kg	JK	U	25
E1801138	SL0171	E1801138-004	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.6	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.916	ng/kg	JK	U	25
E1801138	SL0178	E1801138-010	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	1.17	ng/kg	JK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.741	ng/kg	JK	U	25
E1801138	SL0170	E1801138-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.08	ng/kg	K	U	25
E1801138	SL0171	E1801138-004	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.875	ng/kg	JK	U	25
E1801138	SL0172	E1801138-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.1	ng/kg	K	U	25
E1801138	SL0176	E1801138-008	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.96	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.96	ng/kg	JK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.99	ng/kg	K	U	25
E1801138	SL0198	E1801138-013	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.24	ng/kg	K	U	25
E1801138	SL0200	E1801138-015	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.94	ng/kg	JK	U	25
E1801138	SL0202	E1801138-017	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.422	ng/kg	JK	U	25
E1801138	SL0212	E1801138-019	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.72	ng/kg	JK	U	25
E1801138	SL0195	E1801138-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.492	ng/kg	BJK	U	25
E1801138	SL0170	E1801138-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.756	ng/kg	JK	U	25
E1801138	SL0172	E1801138-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	1.47	ng/kg	JK	U	25
E1801138	SL0176	E1801138-008	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.634	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.475	ng/kg	BJK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.452	ng/kg	BJK	U	25
E1801138	SL0201	E1801138-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.618	ng/kg	JK	U	25
E1801138	SL0195	E1801138-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.94	ng/kg	JK	U	25
E1801138	SL0196	E1801138-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	7.76	ng/kg	K	U	25
E1801138	SL0170	E1801138-003	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.73	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801138	SL0172	E1801138-005	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.889	ng/kg	JK	U	25
E1801138	SL0174	E1801138-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	6.51	ng/kg	K	U	25
E1801138	SL0176	E1801138-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.26	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.04	ng/kg	JK	U	25
E1801138	SL0178	E1801138-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.25	ng/kg	JK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.17	ng/kg	JK	U	25
E1801138	SL0198	E1801138-013	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.737	ng/kg	JK	U	25
E1801138	SL0201	E1801138-016	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.744	ng/kg	JK	U	25
E1801138	SL0171	E1801138-004	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.653	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	1.26	ng/kg	JK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.638	ng/kg	JK	U	25
E1801138	SL0171	E1801138-004	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.317	ng/kg	JK	U	25
E1801138	SL0177	E1801138-009	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.922	ng/kg	JK	U	25
E1801138	SL0202	E1801138-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.467	ng/kg	JK	U	25
E1801138	SL0170	E1801138-003	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	2.71	ng/kg	JK	U	25
E1801138	SL0179	E1801138-011	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.742	ng/kg	JK	U	25
E1801138	SL0198	E1801138-013	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	3.42	ng/kg	K	U	25
E1801138	SL0176	E1801138-008	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	17.5	ng/kg	K	U	25
E1801138	SL0172	E1801138-005	EPA1613B	Octachlorodibenzo-p-dioxin	7700	ng/kg	E	J	20
E1801138	SL0179	E1801138-011	EPA1613B	Octachlorodibenzo-p-dioxin	108000	ng/kg	E	J	20
E1801139	SL0219	E1801139-006	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.52	ng/kg	JK	U	25
E1801139	SL0214	E1801139-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.291	ng/kg	JK	U	25
E1801139	SL0232	E1801139-017	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.282	ng/kg	JK	U	25
E1801139	SL0246	E1801139-020	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.534	ng/kg	JK	U	25
E1801139	SL0247	E1801139-021	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.33	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0462	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.342	ng/kg	JK	U	25
E1801139	SL0216	E1801139-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.601	ng/kg	JK	U	25
E1801139	SL0217	E1801139-004	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.74	ng/kg	JK	U	25
E1801139	SL0226	E1801139-012	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.12	ng/kg	JK	U	25
E1801139	SL0230	E1801139-015	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.472	ng/kg	JK	U	25

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801139	SL0231	E1801139-016	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.551	ng/kg	JK	U	25
E1801139	SL0247	E1801139-021	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.93	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.342	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.427	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzofuran	0.194	ng/kg	JK	U	25
E1801139	SL0219	E1801139-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.649	ng/kg	JK	U	25
E1801139	SL0230	E1801139-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.828	ng/kg	JK	U	25
E1801139	SL0231	E1801139-016	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.866	ng/kg	JK	U	25
E1801139	SL0244	E1801139-018	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.3	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.604	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.38	ng/kg	JK	U	25
E1801139	SL0219	E1801139-006	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.546	ng/kg	JK	U	25
E1801139	SL0220	E1801139-007	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.471	ng/kg	JK	U	25
E1801139	SL0225	E1801139-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	4.85	ng/kg	P	J	23
E1801139	SL0226	E1801139-012	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	4.19	ng/kg	P	J	23
E1801139	SL0232	E1801139-017	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.661	ng/kg	JK	U	25
E1801139	SL0245	E1801139-019	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	251	ng/kg	P	J	23
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzofuran	0.162	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.44	ng/kg	JK	U	25
E1801139	SL0216	E1801139-003	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.75	ng/kg	JK	U	25
E1801139	SL0219	E1801139-006	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.29	ng/kg	JK	U	25
E1801139	SL0226	E1801139-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.07	ng/kg	K	U	25
E1801139	SL0230	E1801139-015	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.63	ng/kg	JK	U	25
E1801139	SL0244	E1801139-018	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.1	ng/kg	JK	U	25
E1801139	SL0214	E1801139-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.252	ng/kg	BJK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.446	ng/kg	BJK	U	25
E1801139	SL0225	E1801139-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	1.43	ng/kg	JK	U	25
E1801139	SL0226	E1801139-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	1.85	ng/kg	JK	U	25
E1801139	SL0231	E1801139-016	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.573	ng/kg	BJK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzofuran	0.0893	ng/kg	BJK	U	25
E1801139	SL0214	E1801139-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.316	ng/kg	JK	U	25

Qualified Data Summary Table
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SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.564	ng/kg	JK	U	25
E1801139	SL0219	E1801139-006	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.451	ng/kg	JK	U	25
E1801139	SL0220	E1801139-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.606	ng/kg	JK	U	25
E1801139	SL0230	E1801139-015	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.26	ng/kg	JK	U	25
E1801139	SL0231	E1801139-016	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.527	ng/kg	JK	U	25
E1801139	SL0246	E1801139-020	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.926	ng/kg	JK	U	25
E1801139	SL0247	E1801139-021	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	3.14	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.319	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.35	ng/kg	JK	U	25
E1801139	SL0220	E1801139-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	1.25	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	1,2,3,7,8-Pentachlorodibenzofuran	0.149	ng/kg	JK	U	25
E1801139	SL0214	E1801139-001	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.104	ng/kg	JK	U	25
E1801139	SL0219	E1801139-006	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.361	ng/kg	JK	U	25
E1801139	SL0220	E1801139-007	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.184	ng/kg	JK	U	25
E1801139	SL0226	E1801139-012	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	3.05	ng/kg	K	U	25
E1801139	SL0230	E1801139-015	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.929	ng/kg	JK	U	25
E1801139	SL0231	E1801139-016	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.288	ng/kg	JK	U	25
E1801139	SL0232	E1801139-017	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.223	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzofuran	0.134	ng/kg	JK	U	25
E1801139	SL0215	E1801139-002	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.358	ng/kg	JK	U	25
E1801139	SL0232	E1801139-017	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	1.61	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	2,3,4,7,8-Pentachlorodibenzofuran	0.246	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.896	ng/kg	K	U	25
E1801139	SL0244	E1801139-018	EPA1613B	Octachlorodibenzo-p-dioxin	26100	ng/kg	E	J	20
E1801139	SL0214	E1801139-001	EPA1613B	Octachlorodibenzofuran	2.52	ng/kg	JK	U	25
E1801139	SL0248	E1801139-022	EPA1613B	Octachlorodibenzofuran	0.202	ng/kg	JK	U	25
K1811120	SL0064	K1811120-002	SW8151A_1311	2,4-Dichlorophenoxyacetic acid	100	ug/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8151A_1311	2,4-Dichlorophenoxyacetic acid	100	ug/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8151A_1311	2,4-Dichlorophenoxyacetic acid	100	ug/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	2,4,5-Trichlorophenol	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	2,4,5-Trichlorophenol	0.1	mg/L	U	UJ	1

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SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811120	SL0022	K1811120-004	SW8270D13113510	2,4,5-Trichlorophenol	0.1	mg/L	U	UJ	1
K1811120	SL0084	K1811120-001	SW8270D13113510	2,4,6-Trichlorophenol	0.1	mg/L	U	UJ	10L
K1811120	SL0064	K1811120-002	SW8270D13113510	2,4,6-Trichlorophenol	0.1	mg/L	U	UJ	1,10L
K1811120	SL0065	K1811120-003	SW8270D13113510	2,4,6-Trichlorophenol	0.1	mg/L	U	UJ	1,10L
K1811120	SL0022	K1811120-004	SW8270D13113510	2,4,6-Trichlorophenol	0.1	mg/L	U	UJ	1,10L
K1811120	SL0064	K1811120-002	SW8270D13113510	2,4-Dinitrotoluene	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	2,4-Dinitrotoluene	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	2,4-Dinitrotoluene	0.1	mg/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	2-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	2-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	2-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	4-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	4-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	4-Methylphenol	0.1	mg/L	U	UJ	1
K1811120	SL0084	1901287-01A	SWSW7.3.3.2	Cyanide	130	mg/kg	HU	UJ	1
K1811120	SL0064	1901287-02A	SWSW7.3.3.2	Cyanide	130	mg/kg	HU	UJ	1
K1811120	SL0065	1901287-03A	SWSW7.3.3.2	Cyanide	160	mg/kg	HU	UJ	1
K1811120	SL0022	1901287-04A	SWSW7.3.3.2	Cyanide	130	mg/kg	HU	UJ	1
K1811120	FW0001	1901287-05A	SWSW7.3.3.2	Cyanide	100	mg/kg	HU	UJ	1
K1811120	FB0001	1901287-06A	SWSW7.3.3.2	Cyanide	100	mg/kg	HU	UJ	1
K1811120	SL0064	K1811120-002	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	340	mg/kg	Y	J	14
K1811120	SL0065	K1811120-003	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	430	mg/kg	DY	J	14
K1811120	FW0001	K1811120-005	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	800	ug	U	UJ	1
K1811120	FB0001	K1811120-006	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	1600	ug	U	UJ	1
K1811120	SL0084	K1811120-001	SW80811311_3511	Endrin	0.0001	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Endrin	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Endrin	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Endrin	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Endrin	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Endrin	0.0001	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	Endrin	0.0001	mg/L	U	UJ	1,13L

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SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811120	SL0022	K1811120-004	SW80811311_3511	Endrin	0.0001	mg/L	U	DNR	11
K1811120	SL0084	K1811120-001	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	DNR	11
K1811120	SL0084	K1811120-001	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	UJ	13L
K1811120	SL0064	K1811120-002	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	DNR	11
K1811120	SL0084	K1811120-001	SW80811311_3511	Heptachlor	0.0001	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Heptachlor	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Heptachlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0064	K1811120-002	SW80811311_3511	Heptachlor	0.0001	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Heptachlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Heptachlor	0.0001	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	Heptachlor	0.0001	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	Heptachlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW8270D13113510	Hexachloroethane	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	Hexachloroethane	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Hexachloroethane	0.1	mg/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	Hexachlorobenzene	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	Hexachlorobenzene	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Hexachlorobenzene	0.1	mg/L	U	UJ	1

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SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811120	SL0064	K1811120-002	SW8270D13113510	Hexachlorobutadiene	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	Hexachlorobutadiene	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Hexachlorobutadiene	0.1	mg/L	U	UJ	1
K1811120	SL0084	K1811120-001	SW8260C13115035	2-Butanone	8	mg/L	U	UJ	10L
K1811120	SL0064	K1811120-002	SW8260C13115035	2-Butanone	8	mg/L	U	UJ	10L
K1811120	SL0065	K1811120-003	SW8260C13115035	2-Butanone	8	mg/L	U	UJ	10L
K1811120	SL0022	K1811120-004	SW8260C13115035	2-Butanone	8	mg/L	U	UJ	10L
K1811120	SL0084	K1811120-001	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0064	K1811120-002	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	DNR	11
K1811120	SL0084	1901287-01A	SW3550C	Moisture	22	percent	H	J	1
K1811120	SL0064	1901287-02A	SW3550C	Moisture	26	percent	H	J	1
K1811120	SL0065	1901287-03A	SW3550C	Moisture	36	percent	H	J	1
K1811120	SL0022	1901287-04A	SW3550C	Moisture	24	percent	H	J	1
K1811120	SL0064	K1811120-002	SW8270D13113510	Nitrobenzene	0.1	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	Nitrobenzene	0.1	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Nitrobenzene	0.1	mg/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	Pentachlorophenol	0.25	mg/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8270D13113510	Pentachlorophenol	0.25	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Pentachlorophenol	0.25	mg/L	U	UJ	1
K1811120	SL0084	K1811120-001	SW9045D	pH	8.13	SU	H	J	1
K1811120	SL0064	K1811120-002	SW9045D	pH	8.15	SU	H	J	1
K1811120	SL0065	K1811120-003	SW9045D	pH	8.29	SU	H	J	1
K1811120	SL0022	K1811120-004	SW9045D	pH	8.52	SU	H	J	1
K1811120	FW0001	K1811120-005	SW9045D	pH	5.53	SU	H	J	1
K1811120	FB0001	K1811120-006	SW9045D	pH	5.43	SU	H	J	1

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811120	SL0084	K1811120-001	SW8270D13113510	Pyridine	0.5	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW8270D13113510	Pyridine	0.25	mg/L	U	UJ	1
K1811120	SL0064	K1811120-002	SW8270D13113510	Pyridine	0.5	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW8270D13113510	Pyridine	0.5	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW8270D13113510	Pyridine	0.25	mg/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8270D13113510	Pyridine	0.5	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW8270D13113510	Pyridine	0.25	mg/L	U	UJ	1
K1811120	SL0084	K1811120-001	SW8015C	Residual Range Hydrocarbons (~C25-C36)	130	mg/kg	O	J	14
K1811120	SL0064	K1811120-002	SW8015C	Residual Range Hydrocarbons (~C25-C36)	510	mg/kg	O	J	14
K1811120	SL0065	K1811120-003	SW8015C	Residual Range Hydrocarbons (~C25-C36)	600	mg/kg	DO	J	14
K1811120	FW0001	K1811120-005	SW8015C	Residual Range Hydrocarbons (~C25-C36)	2000	ug	U	UJ	1
K1811120	FB0001	K1811120-006	SW8015C	Residual Range Hydrocarbons (~C25-C36)	4000	ug	U	UJ	1
K1811120	SL0064	K1811120-002	SW6010C13113010	Selenium	0.02	mg/L	J	U	7
K1811120	SL0022	K1811120-004	SW6010C13113010	Silver	0.05	mg/L	U	UJ	8L
K1811120	SL0064	K1811120-002	SW8151A_1311	Silvex	20	ug/L	U	UJ	1
K1811120	SL0065	K1811120-003	SW8151A_1311	Silvex	20	ug/L	U	UJ	1
K1811120	SL0022	K1811120-004	SW8151A_1311	Silvex	20	ug/L	U	UJ	1
K1811120	SL0064	K1811120-002	EPA_160.3	Solids	74.9	percent		J	1
K1811120	SL0065	K1811120-003	EPA_160.3	Solids	65.3	percent		J	1
K1811120	SL0022	K1811120-004	EPA_160.3	Solids	76.7	percent		J	1
K1811120	SL0084	K1811120-001	SW80811311_3511	Chlordane	0.001	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Chlordane	0.001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Chlordane	0.001	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Chlordane	0.001	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Chlordane	0.001	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Chlordane	0.001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Chlordane	0.001	mg/L	U	UJ	1,13L
K1811120	SL0022	K1811120-004	SW80811311_3511	Chlordane	0.001	mg/L	U	DNR	11
K1811120	SL0084	K1811120-001	SW80811311_3511	Toxaphene	0.002	mg/L	U	UJ	13L
K1811120	SL0084	K1811120-001	SW80811311_3511	Toxaphene	0.002	mg/L	U	DNR	11
K1811120	SL0064	K1811120-002	SW80811311_3511	Toxaphene	0.002	mg/L	U	UJ	1,13L

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811120	SL0064	K1811120-002	SW80811311_3511	Toxaphene	0.002	mg/L	U	DNR	11
K1811120	SL0065	K1811120-003	SW80811311_3511	Toxaphene	0.002	mg/L	U	UJ	1,13L
K1811120	SL0065	K1811120-003	SW80811311_3511	Toxaphene	0.002	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	Toxaphene	0.002	mg/L	U	DNR	11
K1811120	SL0022	K1811120-004	SW80811311_3511	Toxaphene	0.002	mg/L	U	UJ	1,13L
K1811381	SL0153	K1811381-004	SW8270D13113510	2,4,5-Trichlorophenol	0.011	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	2,4,5-Trichlorophenol	0.014	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	2,4,6-Trichlorophenol	0.0084	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	2,4,6-Trichlorophenol	0.011	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	2,4-Dinitrotoluene	0.016	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	2,4-Dinitrotoluene	0.021	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	2-Methylphenol	0.011	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	2-Methylphenol	0.014	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	4-Methylphenol	0.0058	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	4-Methylphenol	0.0074	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	8.1	mg/kg	J	J	5BH
K1811381	SL0146	K1811381-005	SW8015C	Diesel Range Hydrocarbons (~C12-C28)	1300	mg/kg	Y	J	5BH,14
K1811381	SL0146	K1811381-005	SW80811311_3511	Endrin	0.0001	mg/L	U	UJ	13L
K1811381	SL0146	K1811381-005	SW80811311_3511	gamma-Benzenehexachloride	0.0001	mg/L	U	UJ	13L
K1811381	SL0146	K1811381-005	SW8015C	Gasoline Range Hydrocarbons (~C6-C12)	52	mg/kg		J	13H
K1811381	SL0146	K1811381-005	SW80811311_3511	Heptachlor	0.0001	mg/L	U	UJ	13L
K1811381	SL0146	K1811381-005	SW80811311_3511	Heptachlor epoxide	0.0001	mg/L	U	UJ	13L
K1811381	SL0153	K1811381-004	SW8270D13113510	Hexachloroethane	0.0058	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Hexachloroethane	0.0075	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	Hexachlorobenzene	0.012	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Hexachlorobenzene	0.015	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	Hexachlorobutadiene	0.0078	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Hexachlorobutadiene	0.01	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8260C13115035	2-Butanone	0.76	mg/L	U	UJ	10L
K1811381	SL0146	K1811381-005	SW8260C13115035	2-Butanone	0.76	mg/L	U	UJ	10L
K1811381	SL0146	K1811381-005	SW80811311_3511	Methoxychlor	0.0001	mg/L	U	UJ	13L

Qualified Data Summary Table
San Jacinto Waste Pits
South Impoundments Sampling

SDG	Sample ID	Lab Sample II	Method	Analyte	Result	Units	Lab Flag	DV Qualifier	DV Reason
K1811381	SL0153	K1811381-004	SW8270D13113510	Nitrobenzene	0.0097	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Nitrobenzene	0.013	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8270D13113510	Pentachlorophenol	0.014	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Pentachlorophenol	0.017	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW9045D	pH	8.33	SU	H	J	1
K1811381	SL0146	K1811381-005	SW9045D	pH	9.62	SU	H	J	1
K1811381	SL0153	K1811381-004	SW8270D13113510	Pyridine	0.31	mg/L	U	UJ	1
K1811381	SL0146	K1811381-005	SW8270D13113510	Pyridine	0.4	mg/L	U	UJ	1
K1811381	SL0153	K1811381-004	SW8015C	Residual Range Hydrocarbons (~C25-C36)	60	mg/kg	O	J	14
K1811381	SL0146	K1811381-005	SW8015C	Residual Range Hydrocarbons (~C25-C36)	1500	mg/kg	O	J	14
K1811381	SL0153	K1811381-001	EPA_160.3	Solids	69.1	percent		J	1
K1811381	SL0153	K1811381-004	EPA_160.3	Solids	82	percent		J	1
K1811381	SL0146	K1811381-005	EPA_160.3	Solids	63.5	percent		J	1
K1811381	SL0146	K1811381-005	EPA_300.0	Sulfate	746	mg/kg		J	1
K1811381	SL0146	K1811381-005	SW80811311_3511	Chlordane	0.001	mg/L	U	UJ	13L
K1811381	SL0146	K1811381-005	SW80811311_3511	Toxaphene	0.002	mg/L	U	UJ	13L

Appendix A-3
First Phase Pre-Design Investigation Photographic Log

Photo 1 - Chemistry Sample from location SJSB008-E1 at 0 to 2 feet (ft).

Photo 2 - Chemistry Sample from location SJSB008-E1 at 2 to 4 ft.

Photo 3 - Chemistry Sample from location SJSB008-E1 at 4 to 6 ft.

Photo 4 - Chemistry Sample from location SJSB008-E1 6 to 8 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 5 - Chemistry Sample from location SJSB008-E1 8 to 10 ft.

Photo 6 - Chemistry Sample from location SJSB008-E2 0 to 2 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 7 - Chemistry Sample from location SJSB008-E2 2 to 4 ft.

Photo 8 - Chemistry Sample from location SJSB008-E2 4 to 6 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 9 - Chemistry Sample from location SJSB008-E2 6 to 8 ft.

Photo 10 - Chemistry Sample from location SJSB008-E2 8 to 10 ft.

Photo 11 - Chemistry Sample from location SJSB008-N1 0 to 2 ft.

Photo 12 - Chemistry Sample from location SJSB008-N1 2 to 4 ft.

Photo 13 - Chemistry Sample from location SJSB008-N1 4 to 6 ft.

Photo 14 - Chemistry Sample from location SJSB008-N1 6 to 8 ft.

Photo 15 - Chemistry Sample from location SJSB008-N1 8 to 10 ft.

Photo 16 - Chemistry Sample from location SJSB008-S1 0 to 2 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 17 - Chemistry Sample from location SJSB008-S1 2 to 4 ft.

Photo 18 - Chemistry Sample from location SJSB008-S1 4 to 6 ft.

Photo 19 - Chemistry Sample from location SJSB008-S1 6 to 8 ft.

Photo 20 - Chemistry Sample from location SJSB008-S1 8 to 10 ft.

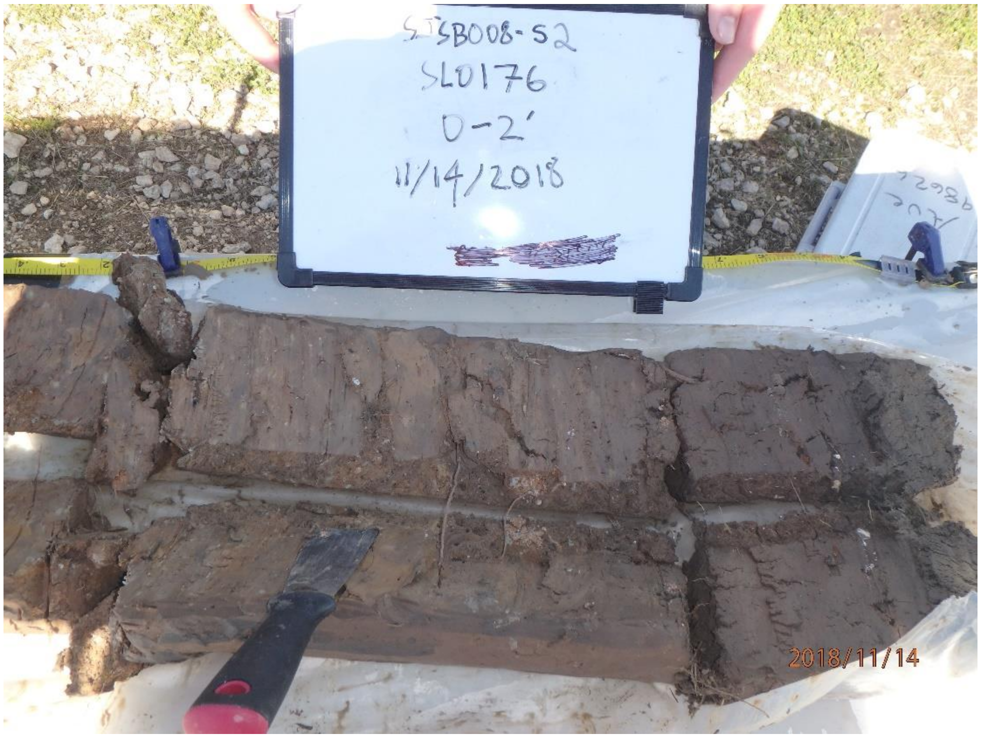

Photo 21 - Chemistry Sample from location SJSB008-S2 0 to 2 ft.

Photo 22 - Chemistry Sample from location SJSB008-S2 2 to 4 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 23 - Chemistry Sample from location SJSB008-S2 4 to 6 ft.

Photo 24 - Chemistry Sample from location SJSB008-S2 6 to 8 ft.

Photo 25 - Chemistry Sample from location SJSB008-S2 8 to 10 ft.

Photo 26 - Chemistry Sample from location SJSB008-W1 0 to 2 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 27 - Chemistry Sample from location SJSB008-W1 2 to 4 ft.

Photo 28 - Chemistry Sample from location SJSB008-W1 4 to 6 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 29 - Chemistry Sample from location SJSB008-W1 6 to 8 ft.

Photo 30 - Chemistry Sample from location SJSB008-W1 8 to 10 ft.

Photo 31 - Chemistry Sample from location SJSB008-W2 0 to 2 ft.

Photo 32 - Chemistry Sample from location SJSB008-W2 2 to 4 ft.

First Phase Pre-Design Investigation Sample Photographs

Photo 33 - Chemistry Sample from location SJSB008-W2 4 to 6 ft.

Photo 34 - Chemistry Sample from location SJSB008-W2 6 to 8 ft.

Photo 35 - Chemistry Sample from location SJSB008-W2 8 to 10 ft.

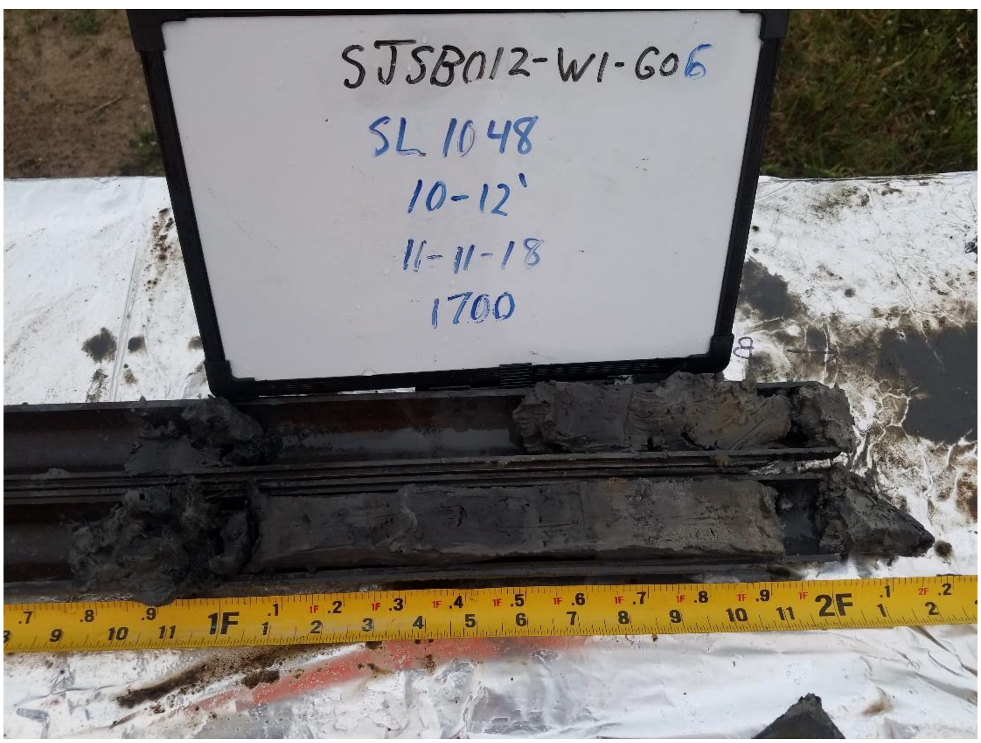

Photo 36 - Geotechnical sample from location SJSB012-W1 at 10 to 12 ft.

First Phase Pre-Design Investigation Sample Photographs

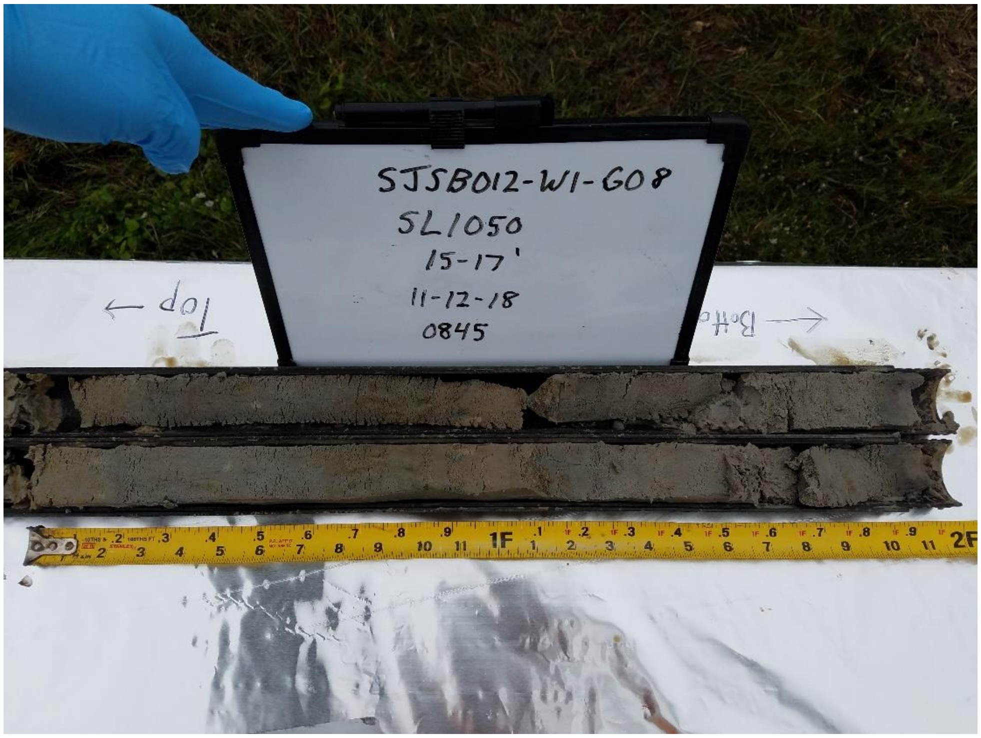

Photo 37 - Geotechnical sample from location SJSB012-W1 at 15 to 17 ft.

Photo 38 - Geotechnical sample from location SJSB012-W1 at 20 to 22 ft.

Photo 39 - Geotechnical sample from location SJSB012-W1 at 25 to 27 ft.

Photo 40 - Geotechnical sample from location SJSB023-E1 at 10 to 12 ft.

First Phase Pre-Design Investigation Sample Photographs

Appendix A-4
Second Phase Pre-Design Investigation Laboratory Reports

Appendix A-5
Second Phase Pre-Design Investigation Data Validation Report

Memorandum

March 4, 2020

To:	Charles Munce	Ref. No.:	11187072
	DJB		
From:	Deborah Brennan/cs/3-NF	Tel:	513-285-1104
CC:	Janie Smith Stefanie Castracane		

Subject: **Analytical Results and Validation - High Resolution**
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event – South Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

1. Introduction

This document details a validation of analytical results for soil boring samples collected in support of the Predesign Investigation Sampling Event – Southern Impoundment Area at the San Jacinto River Waste Pits Superfund Site from September through November 2019. Samples were submitted to Eurofins TestAmerica, Inc. at locations in Sacramento, California, and Knoxville, Tennessee. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. The sample delivery groups covered in the report are identified in Table 1. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, recovery data from surrogate spikes/laboratory control samples (LCS), matrix spikes (MS) and field Quality Assurance/Quality Control (QA/QC) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "Quality Assurance Project Plan, Final Second Phase Pre-Design Investigation", San Jacinto River Waste Pits Site, Harris County, Texas, Report No 6, June 3 2019

ii) "National Functional Guidelines for High Resolution Superfund Methods Data Review", OLEM 9200.3-115, EPA 542-B-16-001, April 2016

Item ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criterion for the analyses are summarized in Table 3. The sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were delivered on ice and stored by the laboratory at the required temperature (0-6°C).

3. Gas Chromatography/Mass Spectrometry (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check)

Prior to dioxin/furans analyses, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the method requires the analysis of the specific tuning compound perfluorokerosene (PFK). The resulting spectra must meet the criteria cited in the method before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout the analysis period. All tuning criteria were met, indicating that proper optimization of the instrumentation was achieved.

4. Initial Calibration

To quantify dioxin/furans of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a minimum of a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the criteria cited in the methods.

The initial calibration data were reviewed. All compounds met the method criteria for sensitivity and linearity.

5. Continuing Calibration

To ensure that instrument calibration for the analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

Calibration standards were analyzed at the required frequency, and all results met the method criteria for instrument sensitivity and stability.

6. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with the investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per analytical batch.

Several method blank results had low-level detections. Those investigative results of similar concentrations to those found in the method blanks were qualified as non-detect (U) as shown in Table 4.

7. Spiked C-13 Labeled PCDD/PCDF

In accordance with the method employed, all samples, blanks, and QC samples analyzed for Polychlorinated Dibenzodioxins/Polychlorinated Dibenzo-p-furan (PCDD/PCDF) are spiked with labeled congeners prior to extraction to be an internal standard for the quantitation of native congeners, and to serve as surrogates for the assessment of method performance in the sample matrix.

All samples submitted for PCDD/PCDF determinations were spiked with the appropriate number of labeled compounds prior to sample extraction and analysis.

Labeled congener recoveries and ion abundance ratios were assessed against method control limits. All Dioxin/Furan recoveries were within the method acceptance ranges. However, a few ion abundance ratios were outside of the acceptable limits and the associated sample results were qualified as estimated as shown in Table 5.

8. Cleanup Standard Recoveries

C-37 labeled cleanup standards are added to all samples, blanks, and QC samples subsequent to extraction, but prior to the cleanup procedures to assess the efficiency of the cleanup procedures.

Cleanup standards were added to all samples, blanks, and QC samples prior to cleanup. All Dioxin/Furan recoveries were within the method acceptance ranges.

9. Laboratory Control Sample Analyses

LCS and/or LCS/laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS and/or LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

10. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, no qualification of the data was performed based on the acceptable recovery of the companion spike and the acceptable RPD.

MS/MSD analyses was performed as specified in Table 1. The laboratory performed additional site-specific MS/MSD analyses internally.

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision with the exception of those shown in Table 6.

11. Field QA/QC Samples

The field QA/QC consisted of eight field duplicate sample sets.

To assess the analytical and sampling protocol precision, eight field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with this duplicate sample were assessed per the Guidelines.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision with the exception of those shown in Table 7 that showed elevated variability.

12. Analyte Reporting

The laboratory reported detected results down to the laboratory's estimated detection limit (EDL) for each analyte. Positive analyte detections less than the reporting limit (RL) but greater than the EDL were reported as estimated (J) in Table 2 unless otherwise qualified in the Memorandum. Non-detect results were presented as non-detect at the estimated detection limit (EDL) in Table 2.

All results were reported on a dry weight basis.

Those sample results that exceeded the range of the calibration curve were qualified as estimated (J) as shown in Table 8.

Diphenyl ether interferences were observed at the exact retention time and mass channel for several furans. All associated sample results were qualified as estimated as shown in Table 9.

13. Target Compound Identification/Sample Quantitation

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time, ion abundance ratio, and chromatography were evaluated according to the identification criteria established by the methods. An erroneous identification can be either a false-positive (reporting a target compound when it is not present in the sample) or false-negative (not reporting a compound that is present in the sample).

The samples identified in Table 1 were reviewed. Most congeners reported adhered to the specified identification criteria.

Some sample results were reported as positive hits although the ion abundance ratio was not met. The associated results were qualified as the estimated maximum possible concentration. A summary of these qualified data is presented in Table 10.

14. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)	Comments
140-16673-1	11187072-091619-BN-DUP2	SJSB063	Soil	8	10	09/16/2019	-	X	Field Duplicate of 11187072-091619-BN-SJSB063-S (8-10)
	11187072-091619-BN-DUP3	SJSB061	Soil	8	10	09/16/2019	-	X	Field Duplicate of 11187072-091619-BN-SJSB061-S (8-10)
	11187072-091619-BN-SJSB061-S (0-2)	SJSB061	Soil	0	2	09/16/2019	14:15	X	
	11187072-091619-BN-SJSB061-S (2-4)	SJSB061	Soil	2	4	09/16/2019	14:15	X	
	11187072-091619-BN-SJSB061-S (4-6)	SJSB061	Soil	4	6	09/16/2019	14:15	X	
	11187072-091619-BN-SJSB061-S (6-8)	SJSB061	Soil	6	8	09/16/2019	14:30	X	
	11187072-091619-BN-SJSB061-S (8-10)	SJSB061	Soil	8	10	09/16/2019	14:30	X	MS/MSD
	11187072-091619-BN-SJSB062-S (0-2)	SJSB062	Soil	0	2	09/16/2019	13:25	X	
	11187072-091619-BN-SJSB062-S (2-4)	SJSB062	Soil	2	4	09/16/2019	13:25	X	
	11187072-091619-BN-SJSB062-S (4-6)	SJSB062	Soil	4	6	09/16/2019	13:25	X	
	11187072-091619-BN-SJSB062-S (6-8)	SJSB062	Soil	6	8	09/16/2019	13:40	X	
	11187072-091619-BN-SJSB062-S (8-10)	SJSB062	Soil	8	10	09/16/2019	13:40	X	
	11187072-091619-BN-SJSB063-S (0-2)	SJSB063	Soil	0	2	09/16/2019	08:55	X	
	11187072-091619-BN-SJSB063-S (2-4)	SJSB063	Soil	2	4	09/16/2019	08:55	X	
	11187072-091619-BN-SJSB063-S (4-6)	SJSB063	Soil	4	6	09/16/2019	08:55	X	
	11187072-091619-BN-SJSB063-S (6-8)	SJSB063	Soil	6	8	09/16/2019	09:05	X	
	11187072-091619-BN-SJSB063-S (8-10)	SJSB063	Soil	8	10	09/16/2019	09:05	X	
140-16673-2	11187072-091619-BN-SJSB061-C1-S (0-2)	SJSB061-C1	Soil	0	2	09/16/2019	14:40	X	
	11187072-091619-BN-SJSB061-C1-S (2-4)	SJSB061-C1	Soil	2	4	09/16/2019	14:40	X	
	11187072-091619-BN-SJSB061-C1-S (4-6)	SJSB061-C1	Soil	4	6	09/16/2019	14:40	X	
	11187072-091619-BN-SJSB061-C1-S (6-8)	SJSB061-C1	Soil	6	8	09/16/2019	14:50	X	
	11187072-091619-BN-SJSB061-C1-S (8-10)	SJSB061-C1	Soil	8	10	09/16/2019	14:50	X	
140-16959-1	11187072-100819-BN-DUP4	SJSB060	Soil	4	6	10/08/2019	-	X	Field Duplicate of 11187072-100819-BN-SJSB060-S (4-6)
	11187072-100819-BN-SJSB060-S (0-2)	SJSB060	Soil	0	2	10/08/2019	14:35	X	
	11187072-100819-BN-SJSB060-S (2-4)	SJSB060	Soil	2	4	10/08/2019	14:35	X	
	11187072-100819-BN-SJSB060-S (4-6)	SJSB060	Soil	4	6	10/08/2019	14:35	X	
	11187072-100819-BN-SJSB060-S (6-8)	SJSB060	Soil	6	8	10/08/2019	14:40	X	
	11187072-100819-BN-SJSB060-S (8-10)	SJSB060	Soil	8	10	10/08/2019	14:40	X	MS/MSD
	11187072-100819-BN-SJSB066-S (0-2)	SJSB066	Soil	0	2	10/08/2019	08:50	X	
	11187072-100819-BN-SJSB066-S (2-4)	SJSB066	Soil	2	4	10/08/2019	08:50	X	
	11187072-100819-BN-SJSB066-S (4-6)	SJSB066	Soil	4	6	10/08/2019	08:50	X	
	11187072-100819-BN-SJSB066-S (6-8)	SJSB066	Soil	6	8	10/08/2019	09:00	X	
	11187072-100819-BN-SJSB066-S (8-10)	SJSB066	Soil	8	10	10/08/2019	09:00	X	
	11187072-100819-BN-SJSB068-S (0-2)	SJSB068	Soil	0	2	10/08/2019	10:10	X	
	11187072-100819-BN-SJSB068-S (2-4)	SJSB068	Soil	2	4	10/08/2019	10:10	X	
	11187072-100819-BN-SJSB068-S (4-6)	SJSB068	Soil	4	6	10/08/2019	10:10	X	
	11187072-100819-BN-SJSB068-S (6-8)	SJSB068	Soil	6	8	10/08/2019	10:15	X	
	11187072-100819-BN-SJSB068-S (8-10)	SJSB068	Soil	8	10	10/08/2019	10:15	X	
	11187072-100819-BN-SJSB069-S (0-2)	SJSB069	Soil	0	2	10/08/2019	13:05	X	
	11187072-100819-BN-SJSB069-S (2-4)	SJSB069	Soil	2	4	10/08/2019	13:05	X	
	11187072-100819-BN-SJSB069-S (4-6)	SJSB069	Soil	4	6	10/08/2019	13:05	X	
	11187072-100819-BN-SJSB069-S (6-8)	SJSB069	Soil	6	8	10/08/2019	13:10	X	
	11187072-100819-BN-SJSB069-S (8-10)	SJSB069	Soil	8	10	10/08/2019	13:10	X	

Table 1

Sample Collection and Analysis Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)	Comments
140-16960-1	11187072-100819-BN-SJSB060-C1-S (0-2)	SJSB060-C1	Soil	0	2	10/08/2019	15:05	X	
	11187072-100819-BN-SJSB060-C1-S (2-4)	SJSB060-C1	Soil	2	4	10/08/2019	15:05	X	
	11187072-100819-BN-SJSB060-C1-S (4-6)	SJSB060-C1	Soil	4	6	10/08/2019	15:05	X	
	11187072-100819-BN-SJSB060-C1-S (6-8)	SJSB060-C1	Soil	6	8	10/08/2019	15:10	X	
	11187072-100819-BN-SJSB060-C1-S (8-10)	SJSB060-C1	Soil	8	10	10/08/2019	15:10	X	
140-16960-2	11187072-100819-BN-SJSB068-C1-S (0-2)	SJSB068-C1	Soil	0	2	10/08/2019	10:40	X	
	11187072-100819-BN-SJSB068-C1-S (2-4)	SJSB068-C1	Soil	2	4	10/08/2019	10:40	X	
	11187072-100819-BN-SJSB068-C1-S (4-6)	SJSB068-C1	Soil	4	6	10/08/2019	10:40	X	
	11187072-100819-BN-SJSB068-C1-S (6-8)	SJSB068-C1	Soil	6	8	10/08/2019	10:45	X	
	11187072-100819-BN-SJSB068-C1-S (8-10)	SJSB068-C1	Soil	8	10	10/08/2019	10:45	X	
140-17005-1	11187072-101219-BN-SJSB059-S (0-2)	SJSB059	Soil	0	2	10/12/2019	08:55	X	
	11187072-101219-BN-SJSB059-S (2-4)	SJSB059	Soil	2	4	10/12/2019	08:55	X	
	11187072-101219-BN-SJSB059-S (4-6)	SJSB059	Soil	4	6	10/12/2019	08:55	X	
	11187072-101219-BN-SJSB059-S (6-8)	SJSB059	Soil	6	8	10/12/2019	09:05	X	
	11187072-101219-BN-SJSB059-S (8-10)	SJSB059	Soil	8	10	10/12/2019	09:05	X	
320-54325-1	11187072-091219-BN-DUP1	SJSB065	Soil	8	10	09/12/2019	-	X	Field Duplicate of 11187072-091219-BN-SJSB065-S(8-10)
	11187072-091219-BN-SJSB065-S(0-2)	SJSB065	Soil	0	2	09/12/2019	14:05	X	
	11187072-091219-BN-SJSB065-S(2-4)	SJSB065	Soil	2	4	09/12/2019	14:05	X	
	11187072-091219-BN-SJSB065-S(4-6)	SJSB065	Soil	4	6	09/12/2019	14:05	X	
	11187072-091219-BN-SJSB065-S(6-8)	SJSB065	Soil	6	8	09/12/2019	14:20	X	
	11187072-091219-BN-SJSB065-S(8-10)	SJSB065	Soil	8	10	09/12/2019	14:20	X	MS/MSD
	11187072-091219-BN-SJSB067-S(0-2)	SJSB067	Soil	0	2	09/12/2019	09:35	X	
	11187072-091219-BN-SJSB067-S(2-4)	SJSB067	Soil	2	4	09/12/2019	09:35	X	
	11187072-091219-BN-SJSB067-S(4-6)	SJSB067	Soil	4	6	09/12/2019	09:35	X	
	11187072-091219-BN-SJSB067-S(6-8)	SJSB067	Soil	6	8	09/12/2019	09:45	X	
	11187072-091219-BN-SJSB067-S(8-10)	SJSB067	Soil	8	10	09/12/2019	09:45	X	
320-54325-2	11187072-091219-BN-SJSB067-CI-S(0-2)	SJSB067-C1	Soil	0	2	09/12/2019	11:25	X	
	11187072-091219-BN-SJSB067-CI-S(2-4)	SJSB067-C1	Soil	2	4	09/12/2019	11:25	X	
	11187072-091219-BN-SJSB067-CI-S(4-6)	SJSB067-C1	Soil	4	6	09/12/2019	11:25	X	
	11187072-091219-BN-SJSB067-CI-S(6-8)	SJSB067-C1	Soil	6	8	09/12/2019	11:40	X	
	11187072-091219-BN-SJSB067-CI-S(8-10)	SJSB067-C1	Soil	8	10	09/12/2019	11:40	X	
320-54325-3	11187072-091219-BN-SJSB066-CI-S(0-2)	SJSB066-C1	Soil	0	2	09/12/2019	10:25	X	
	11187072-091219-BN-SJSB066-CI-S(2-4)	SJSB066-C1	Soil	2	4	09/12/2019	10:25	X	
	11187072-091219-BN-SJSB066-CI-S(4-6)	SJSB066-C1	Soil	4	6	09/12/2019	10:25	X	
	11187072-091219-BN-SJSB066-CI-S(6-8)	SJSB066-C1	Soil	6	8	09/12/2019	10:35	X	
	11187072-091219-BN-SJSB066-CI-S(8-10)	SJSB066-C1	Soil	8	10	09/12/2019	10:35	X	

Table 1

Sample Collection and Analysis Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)	Comments
320-55090-1	11187072-100719-BN-DUP2A	SJSB064	Soil	8	10	10/07/2019	-	X	Field Duplicate of 11187072-100719-BN-SJSB064-S(8-10)
	11187072-100719-BN-SJSB064-S(0-2)	SJSB064	Soil	0	2	10/07/2019	14:30	X	
	11187072-100719-BN-SJSB064-S(2-4)	SJSB064	Soil	2	4	10/07/2019	14:30	X	
	11187072-100719-BN-SJSB064-S(4-6)	SJSB064	Soil	4	6	10/07/2019	14:30	X	
	11187072-100719-BN-SJSB064-S(6-8)	SJSB064	Soil	6	8	10/07/2019	14:40	X	
	11187072-100719-BN-SJSB064-S(8-10)	SJSB064	Soil	8	10	10/07/2019	14:40	X	MS/MSD
320-55246-1	11187072-100919-BN-SJSB065-C1-5(0-2)	SJSB065-C1	Soil	0	2	10/09/2019	09:25	X	
	11187072-100919-BN-SJSB065-C1-5(2-4)	SJSB065-C1	Soil	2	4	10/09/2019	09:25	X	
	11187072-100919-BN-SJSB065-C1-5(4-6)	SJSB065-C1	Soil	4	6	10/09/2019	09:25	X	
	11187072-100919-BN-SJSB065-C1-5(6-8)	SJSB065-C1	Soil	6	8	10/09/2019	09:30	X	
	11187072-100919-BN-SJSB065-C1-5(8-10)	SJSB065-C1	Soil	8	10	10/09/2019	09:30	X	
320-56615-1	11187072-112419-NG-Dup 1	SJSB060-C2	Soil	0	2	11/24/2019	-	X	Field Duplicate of 11187072-112419-NG-SJSB060-C2(0-2)
	11187072-112419-NG-Dup 2	SJSB060-C3	Soil	0	2	11/24/2019	-	X	Field Duplicate of 11187072-112419-NG-SJSB060-C3(0-2)
	11187072-112419-NG-SJSB060-C2(0-2)	SJSB060-C2	Soil	0	2	11/24/2019	14:00	X	
	11187072-112419-NG-SJSB060-C2(2-4)	SJSB060-C2	Soil	2	4	11/24/2019	14:10	X	
	11187072-112419-NG-SJSB060-C2(4-6)	SJSB060-C2	Soil	4	6	11/24/2019	14:15	X	
	11187072-112419-NG-SJSB060-C2(6-8)	SJSB060-C2	Soil	6	8	11/24/2019	14:20	X	
	11187072-112419-NG-SJSB060-C2(8-10)	SJSB060-C2	Soil	8	10	11/24/2019	14:05	X	
	11187072-112419-NG-SJSB060-C3(0-2)	SJSB060-C3	Soil	0	2	11/24/2019	13:00	X	
	11187072-112419-NG-SJSB060-C3(2-4)	SJSB060-C3	Soil	2	4	11/24/2019	13:05	X	
	11187072-112419-NG-SJSB060-C3(4-6)	SJSB060-C3	Soil	4	6	11/24/2019	13:10	X	
	11187072-112419-NG-SJSB060-C3(6-8)	SJSB060-C3	Soil	6	8	11/24/2019	13:15	X	
	11187072-112419-NG-SJSB060-C3(8-10)	SJSB060-C3	Soil	8	10	11/24/2019	13:20	X	
320-56681-1	11187072-112319-SS-DUP-1	SJSB061-C2	Soil	0	2	11/25/2019	-	X	Field Duplicate of 11187072-112519-SS-SJSB061-C2(0-2)
	11187072-112519-SS-SJSB061-C2(0-2)	SJSB061-C2	Soil	0	2	11/25/2019	10:35	X	
	11187072-112519-SS-SJSB061-C2(2-4)	SJSB061-C2	Soil	2	4	11/25/2019	10:45	X	
	11187072-112619-SS-SJSB061-C2(4-6)	SJSB061-C2	Soil	4	6	11/26/2019	08:30	X	
	11187072-112619-SS-SJSB061-C2(6-8)	SJSB061-C2	Soil	6	8	11/26/2019	08:40	X	
	11187072-112619-SS-SJSB061-C2(8-10)	SJSB061-C2	Soil	8	10	11/26/2019	08:50	X	

Notes:

ft. bgs. - Feet below ground surface
MS/MSD - Matrix Spike/Matrix Spike Duplicate

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB059**	**SJSB059**
	Sample Name:	**11187072-101219-BN-SJSB059-S (0-2)**	**11187072-101219-BN-SJSB059-S (2-4)**
	Sample Date:	**10/12/2019**	**10/12/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	13000 J	340
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	25	2.8 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130	8.6
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	6.5	0.91 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.61 J	0.057 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.2 J	0.27 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.2 J	0.29 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.5 J	0.42 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.71 J	0.052 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.4 J	0.69 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.14 U	0.062 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.61 J	0.38 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.32 J	0.21 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.41 J	0.051 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.42 J	0.12 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.9	0.71 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	5.8	1.6
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	340 J	24 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	17 J	1.7 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	38 J	6.2 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	12 J	1.7 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	2.5 J	0.98 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	6.0 J	1.4 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.5 J	1.6 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	16 J	7.6 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	9.45	1.66
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	9.45	1.67

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB059**	**SJSB059**
	Sample Name:	**11187072-101219-BN-SJSB059-S (4-6)**	**11187072-101219-BN-SJSB059-S (6-8)**
	Sample Date:	**10/12/2019**	**10/12/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	700	4300
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	38	630
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	54	310
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	8.0 J	99
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.23 U	29 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.18 U	2.6 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.1 J	450
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.8 J	13 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.60 J	110
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.7 J	6.4 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.15 U	13 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.81 J	7.8 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.13 U	360
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.13 U	16 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.28 J	150
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.73 J	730
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.96 J	1400
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	120 J	700 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	25 J	330 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	35 J	110 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	9.3 J	790 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	7.2 J	23 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	3.7 J	880 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.9 J	810 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	10 J	3700 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	3.48	1000
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	3.51	1000

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB059**	**SJSB060**
	Sample Name:	**11187072-101219-BN-SJSB059-S (8-10)**	**11187072-100819-BN-SJSB060-S (0-2)**
	Sample Date:	**10/12/2019**	**10/08/2019**
	Depth:	**8-10 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2600	1600
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	91	86
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	79	160
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	6.9 J	30
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.3 J	3.1 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.1 J	1.8 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	6.0 J	9.6
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.1 J	6.0 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	3.1 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.9 J	5.4 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.10 U	0.43 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.4 J	1.5 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.8 J	4.0 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.34 J	1.2 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.0 J	2.5 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	28	20
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	78	66
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	230 J	430 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	16 J	88 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	54 J	71 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	15 J	52 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	13 J	3.7 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	14 J	29 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	36 J	27 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	150 J	110 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	41.7	34.1
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	41.1	34.1

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060**	**SJSB060**
	Sample Name:	**11187072-100819-BN-SJSB060-S (2-4)**	**11187072-100819-BN-SJSB060-S (4-6)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	1300	680
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	36	1.1 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	100	48
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	15	0.60 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.0 U	0.10 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.6 J	0.48 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.3 J	0.39 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.7 J	2.2 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.2 J	0.12 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.3 J	2.1 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.16 U	0.15 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.1 J	0.52 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.74 J	0.098 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.67 J	0.12 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.83 J	0.42 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.7	1.4 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	13	7.3
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	250 J	120 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	38 J	1.1 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	48 J	28 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	23 J	1.4 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.5 J	6.2 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	12 J	0.58 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	7.9 J	4.8 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	25 J	13 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	10.4	3.46
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	10.4	3.74

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060**	**SJSB060**
	Sample Name:	**11187072-100819-BN-DUP4**	**11187072-100819-BN-SJSB060-S (6-8)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
		Duplicate	
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	250	22000
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	20	2400
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	18	1900
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.3 J	1900
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.15 U	580
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.46 J	14 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.56 J	6400
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.1 J	75 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.10 U	1600 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	28 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 U	110 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.099 U	410
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.21 J	4600
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.11 U	210 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.10 U	3100
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.86 J	30000 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1.6 U	150000 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	50 J	4200 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	1.9 J	3400 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	18 J	970 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.94 J	9800 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	3.0 J	610 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.60 J	13000 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.8 J	33000 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	8.2 J	260000 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.55	47400
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.71	47400

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060**	**SJSB060-C1**
	Sample Name:	**11187072-100819-BN-SJSB060-S (8-10)**	**11187072-100819-BN-SJSB060-C1-S (0-2)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**8-10 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	6700	2200
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	13000 J	14
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	490	42
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	330	6.5
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	31	0.62 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	6.9 J	0.54 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	69 J	1.2 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	29	0.95 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	17	0.59 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	19	1.9 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.50 U	0.098 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.9 J	0.38 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	34	0.14 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	8.1 J	0.40 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	30	0.23 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	540	0.26 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1300	0.78 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1100 J	120 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	700 J	13 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	290 J	17 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	320 J	8.3 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	83 J	2.6 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	330 J	3.2 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	620 J	1.2 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3500 J	2.5 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	718	2.05
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	718	2.28

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C1**	**SJSB060-C1**
	Sample Name:	**11187072-100819-BN-SJSB060-C1-S (2-4)**	**11187072-100819-BN-SJSB060-C1-S (4-6)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	350	2600
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	4.2 U	110
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	17	270
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.1 J	51
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.090 U	6.3 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.24 J	1.9 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.082 U	8.2
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.87 J	9.7
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.082 U	4.8 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.4 J	6.0 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.10 U	0.62 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.33 U	1.3 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.11 U	2.4 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 J	1.5 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.10 U	1.8 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.13 J	3.6
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.99 U	19
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	50 J	550 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	2.6 J	170 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	18 J	150 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2.0 J	96 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	6.1 J	29 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.11 U	40 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.0 J	15 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	2.6 J	59 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	0.679	14.7
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	0.924	14.7

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C1**	**SJSB060-C1**
	Sample Name:	**11187072-100819-BN-SJSB060-C1-S (6-8)**	**11187072-100819-BN-SJSB060-C1-S (8-10)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	6600	9300
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	910	13000
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	560	640
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	480	340
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	140 J	36 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	8.8 J	7.6 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1100	100
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	36 J	34 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	340 J	26 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	26 J	18 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	26 J	0.59 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	110 J	13 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	770	56
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	48 J	9.3 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	540	44
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	9500	760
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	27000 J	1600
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1200 J	1500 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	1100 J	820 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	380 J	310 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2100 J	420 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	230 J	94 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	2400 J	370 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	11000 J	860 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	45000 J	5100 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	12700	984
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	12700	984

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C2**	**SJSB060-C2**
	Sample Name:	**11187072-112419-NG-SJSB060-C2(0-2)**	**11187072-112419-NG-Dup 1**
	Sample Date:	**11/24/2019**	**11/24/2019**
	Depth:	**0-2 ft BGS**	**0-2 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2900	1500
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	65	40
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130	110
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	32	18
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.5 J	1.2 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.6 J	1.5 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.4 J	2.5 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.4 J	3.8 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.2 J	2.2 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.4 J	3.5 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.21 U	0.20 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.68 J	0.51 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.2 J	1.3 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.5 J	1.0 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.2 J	0.98 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.6	2.0
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	16	8.8
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	320 J	270 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	75 J	45 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	41 J	36 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	40 J	26 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	5.1 J	1.9 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	23 J	13 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	5.9 J	3.3 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	24 J	11 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	10.6	6.93
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	10.6	6.94

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	SJSB060-C2	SJSB060-C2
	Sample Name:	11187072-112419-NG-SJSB060-C2(2-4)	11187072-112419-NG-SJSB060-C2(4-6)
	Sample Date:	11/24/2019	11/24/2019
	Depth:	2-4 ft BGS	4-6 ft BGS
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	4400	500
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	47	7.6 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	120	18
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	37	3.4 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.6 J	0.47 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.2 J	0.48 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	5.2 J	2.5 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.0 J	0.47 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.8 J	1.0 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.7 J	1.0 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.23 U	0.10 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.89 J	0.39 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.9 J	1.8 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	0.26 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.2 J	1.1 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	18	16
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	50	42
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	270 J	54 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	97 J	8.3 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	39 J	13 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	51 J	6.0 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	5.6 J	2.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	36 J	4.7 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	21 J	19 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	66 J	49 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	29.5	21.9
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	29.5	21.9

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C2**	**SJSB060-C2**
	Sample Name:	**11187072-112419-NG-SJSB060-C2(6-8)**	**11187072-112419-NG-SJSB060-C2(8-10)**
	Sample Date:	**11/24/2019**	**11/24/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	190	170
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	1.8 J	4.0 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	8.1	9.1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.73 J	1.4 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.20 U	0.17 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.32 U	0.35 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.60 J	0.43 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.33 J	0.35 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.27 J	0.089 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.67 J	0.74 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.29 U	0.20 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.19 J	0.080 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.63 U	0.40 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 J	0.057 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.33 J	0.23 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.1	2.3
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	11	5.9
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	28 J	29 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	1.7 J	4.0 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	10 J	11 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	1.7 J	1.2 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	2.4 J	1.6 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	1.3 J	0.82 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	6.4 J	3.7 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	17 J	8.2 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	5.83	3.27
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	5.87	3.35

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C3**	**SJSB060-C3**
	Sample Name:	**11187072-112419-NG-SJSB060-C3(0-2)**	**11187072-112419-NG-Dup 2**
	Sample Date:	**11/24/2019**	**11/24/2019**
	Depth:	**0-2 ft BGS**	**0-2 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	740 J	3800 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	24 J	94 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	60 J	190 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	10 J	46 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.76 J	2.0 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.90 U	2.1 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.2 J	5.5 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.6 J	5.9 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.94 J	2.7 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	5.8 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 U	0.32 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.34 J	0.72 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.60 U	1.7 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.62 J	1.8 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.48 J	1.5 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.75 J	3.4 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2.9 J	16 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	140 J	440 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	23 J	110 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	20 J	51 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	13 J	52 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.2 J	2.9 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	6.3 J	22 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.2 J	5.2 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3.7 J	23 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	3.20	12.1
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	3.26	12.2

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C3**	**SJSB060-C3**
	Sample Name:	**11187072-112419-NG-SJSB060-C3(2-4)**	**11187072-112419-NG-SJSB060-C3(4-6)**
	Sample Date:	**11/24/2019**	**11/24/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2200	94
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	35	0.81 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	97	5.4 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	19	0.33 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.89 J	0.066 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.81 U	0.33 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.3 J	0.10 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.2 J	0.28 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.0 J	0.096 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.8 J	0.50 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.23 U	0.21 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.45 J	0.089 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.0 U	0.25 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.54 J	0.069 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.73 J	0.095 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.5	0.53 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	15	0.52 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	220 J	20 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	53 J	0.73 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	25 J	6.7 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	20 J	0.37 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	3.5 J	1.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	6.1 J	0.58 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	7.6 J	1.6 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	21 J	0.77 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	9.29	0.719
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	9.36	0.835

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB060-C3**	**SJSB060-C3**
	Sample Name:	**11187072-112419-NG-SJSB060-C3(6-8)**	**11187072-112419-NG-SJSB060-C3(8-10)**
	Sample Date:	**11/24/2019**	**11/24/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	880	150
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	2.7 J	0.80 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	27	5.0 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.70 J	0.25 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.17 U	0.086 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.73 U	0.26 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.17 J	0.091 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.71 J	0.21 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.096 J	0.085 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.7 J	0.36 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.19 U	0.20 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.13 U	0.097 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.27 U	0.18 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.054 U	0.060 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.066 U	0.055 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.18 J	0.12 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.46 U	0.23 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	89 J	17 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	1.6 J	0.61 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	20 J	5.7 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.73 J	0.20 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	5.0 J	1.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.85 J	0.18 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.6 J	1.2 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	1.7 J	0.36 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	0.989	0.272
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.14	0.380

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061**	**SJSB061**
	Sample Name:	**11187072-091619-BN-SJSB061-S (0-2)**	**11187072-091619-BN-SJSB061-S (2-4)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	720	300
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	15	16
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	40	26
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	5.6	3.6 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.53 J	0.50 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.29 J	0.37 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.75 J	1.3 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.99 J	1.1 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.49 J	0.61 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.86 J	1.1 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.11 U	0.17 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.22 J	0.39 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.36 J	0.51 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.25 J	0.13 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.45 J	0.55 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.92 J	5.1
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	3.5	19
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	91 J	82 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	15 J	14 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	13 J	15 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	8.7 J	10 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.2 J	1.3 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	7.9 J	6.7 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.6 J	6.7 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	10 J	38 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	2.68	8.41
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	2.69	8.43

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061**	**SJSB061**
	Sample Name:	**11187072-091619-BN-SJSB061-S (4-6)**	**11187072-091619-BN-SJSB061-S (6-8)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2900	1500
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	64	180 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	160	140 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	22	91 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	4.3 J	24 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.4 J	3.9 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	19	300 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	5.7 J	3.8 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	4.7 J	63 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.5 J	3.6 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.44 J	8.0 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.7 J	13 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	10	140 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.5 J	6.4 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	6.5	78 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	83	1300
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	220	3500
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	580 J	290 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	90 J	170 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	81 J	32 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	73 J	410 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.7 J	13 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	47 J	340 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	99 J	1400 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	460 J	6800 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	115	1730
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	115	1730

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061**	**SJSB061**
	Sample Name:	**11187072-091619-BN-SJSB061-S (8-10)**	**11187072-091619-BN-DUP3**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**8-10 ft BGS**	**8-10 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	81	72
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	22	5.4 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	5.6 J	3.5 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	3.0 J	0.59 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.68 J	0.29 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.13 J	0.096 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	7.1	0.95 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.16 J	0.10 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	0.25 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.30 J	0.22 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 U	0.075 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.35 J	0.10 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	3.1 J	0.51 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.32 J	0.060 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.8 J	0.27 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	25 J	4.2 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	74 J	12 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	14 J	12 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	5.6 J	1.2 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.7 J	4.0 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	11 J	1.4 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.97 J	0.72 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	8.6 J	1.2 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	28 J	5.4 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	150 J	25 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	34.5	5.82
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	34.5	5.83

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C1**	**SJSB061-C1**
	Sample Name:	**11187072-091619-BN-SJSB061-C1-S (0-2)**	**11187072-091619-BN-SJSB061-C1-S (2-4)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	1000	2400
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	48	150
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	71	230
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	17	51
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	2.3 J	6.3
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.2 J	1.9 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	7.8	19
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.3	8.1
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.7 J	5.8 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.6	5.7
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.30 U	0.69 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.29 U	2.0 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.8 J	10
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.8 J	1.7 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.4 J	6.7
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	24	77
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	69	250
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	190 J	730 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	49 J	180 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	47 J	89 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	41 J	100 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.9 J	7.7 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	25 J	56 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	33 J	92 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	130 J	430 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	35.0	114
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	35.1	114

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C1**	**SJSB061-C1**
	Sample Name:	**11187072-091619-BN-SJSB061-C1-S (4-6)**	**11187072-091619-BN-SJSB061-C1-S (6-8)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	760	5900
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	42	3600
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	71	550
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	11	340
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.6 J	82
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.0 J	6.7 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	6.9	820
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.9 J	25 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.9 J	190 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.2	16 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.24 U	15 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.95 J	55 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	4.7	530
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.47 J	28 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.6 J	330
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	37	4200
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	99	4400
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	240 J	1200 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	43 J	680 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	58 J	320 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	32 J	1300 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.3 J	110 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	22 J	1600 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	52 J	4700 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	170 J	30000 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	51.5	4930
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	51.5	4930

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C1**	**SJSB061-C2**
	Sample Name:	**11187072-091619-BN-SJSB061-C1-S (8-10)**	**11187072-112519-SS-SJSB061-C2(0-2)**
	Sample Date:	**09/16/2019**	**11/25/2019**
	Depth:	**8-10 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	130	350
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	32	15
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	7.5	25
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.9 J	4.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.50 J	0.43 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.095 J	0.38 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.6	0.13 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.24 J	0.85 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.93 J	0.12 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.48 J	0.72 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.091 J	0.21 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.40 J	0.090 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.4 J	0.16 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.18 J	0.23 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.6 J	0.12 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	21	0.075 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	55	0.41 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	22 J	48 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	3.9 J	12 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	7.6 J	5.7 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	6.7 J	3.9 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.9 J	0.38 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	7.4 J	1.6 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	24 J	0.075 U
Total tetrachlorodibenzofuran (TCDF)	pg/g	130 J	0.84 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	28.2	0.687
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	28.2	0.801

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C2**	**SJSB061-C2**
	Sample Name:	**11187072-112319-SS-DUP-1**	**11187072-112519-SS-SJSB061-C2(2-4)**
	Sample Date:	**11/25/2019**	**11/25/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
		Duplicate	
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	950	620
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	4.3 U	12
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	15	26
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.5 J	3.6 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.63 J	0.29 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.71 J	0.51 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.59 J	0.43 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.83 J	0.92 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.50 J	0.25 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.5 J	1.1 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.59 J	0.071 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.47 J	0.24 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.40 J	0.16 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.43 J	0.22 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.34 J	0.16 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.54 J	1.1 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1.2	3.4
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	41 J	74 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	3.8 J	10 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	8.0 J	10 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	3.1 J	3.8 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.60 J	0.50 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	1.4 J	1.3 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.54 J	1.3 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	2.0 J	3.9 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	2.22	2.51
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	2.22	2.54

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C2**	**SJSB061-C2**
	Sample Name:	**11187072-112619-SS-SJSB061-C2(4-6)**	**11187072-112619-SS-SJSB061-C2(6-8)**
	Sample Date:	**11/26/2019**	**11/26/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	3000	4800
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	73	130
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	170	160
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	28	21
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.0 J	1.6 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.2 J	1.1 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.7 J	0.29 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	9.2	3.6 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.7 J	1.0 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	6.1 J	2.9 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.13 U	0.18 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.98 J	0.31 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.89 J	0.11 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.0 J	0.61 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.86 J	0.50 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.0	0.30 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	12	0.71 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	430 J	330 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	63 J	100 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	77 J	40 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	32 J	20 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.6 J	5.5 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	16 J	8.9 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	6.0 J	2.6 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	20 J	5.3 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	11.7	5.06
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	11.7	5.08

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB061-C2**	**SJSB062**
	Sample Name:	**11187072-112619-SS-SJSB061-C2(8-10)**	**11187072-091619-BN-SJSB062-S (0-2)**
	Sample Date:	**11/26/2019**	**09/16/2019**
	Depth:	**8-10 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	6300	760
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	93	54
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	160	58
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	25	13
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	2.3 J	1.8 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.9 J	0.57 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.4 J	6.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.6 J	3.3 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.9 J	2.5 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.1 J	2.7 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.74 J	0.29 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.81 J	0.14 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.3 J	2.7 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.4 J	0.54 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.1 J	1.9 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.37 J	12
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1.8	45
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	490 J	120 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	95 J	32 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	62 J	25 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	43 J	34 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	10 J	2.4 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	25 J	31 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	6.3 J	17 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	18 J	100 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	7.32	19.7
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	7.32	19.8

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB062**	**SJSB062**
	Sample Name:	**11187072-091619-BN-SJSB062-S (2-4)**	**11187072-091619-BN-SJSB062-S (4-6)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	620	210
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	24	0.90 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	50	11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	8.6	0.45 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.0 J	0.071 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.64 J	0.049 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.4 J	0.96 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	0.37 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.3 J	0.24 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.5 J	0.86 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.22 U	0.10 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.1 U	0.090 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.5 J	0.42 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.78 J	0.086 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.5 J	0.21 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	8.1	2.4
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	27	7.4
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130 J	40 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	26 J	1.1 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	30 J	36 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	22 J	2.6 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.1 U	3.2 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	16 J	1.6 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	13 J	18 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	58 J	15 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	13.2	3.64
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	13.7	3.69

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	SJSB062	SJSB062
	Sample Name:	11187072-091619-BN-SJSB062-S (6-8)	11187072-091619-BN-SJSB062-S (8-10)
	Sample Date:	09/16/2019	09/16/2019
	Depth:	6-8 ft BGS	8-10 ft BGS
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	150	100
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.15 U	0.14 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	7.9	6.1 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.14 U	0.11 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.034 U	0.042 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.064 U	0.046 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.14 J	0.39 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.063 U	0.048 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.037 U	0.12 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.64 J	0.58 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.049 U	0.050 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.22 J	0.22 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.086 J	0.39 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.042 U	0.041 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.026 U	0.16 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.0 J	1.9
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2.1 J	6.0
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	39 J	33 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.22 J	0.31 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	34 J	31 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.14 J	0.50 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.9 J	9.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.086 J	0.91 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	27 J	28 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3.7 J	13 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.63	2.98
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.65	2.99

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB063**	**SJSB063**
	Sample Name:	**11187072-091619-BN-SJSB063-S (0-2)**	**11187072-091619-BN-SJSB063-S (2-4)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	1600	6900 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	78	120
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	140	600
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	23	51
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	2.0 J	5.0 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.37 U	2.1 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.9 J	13
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.0 J	11
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.4 J	6.0 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.0 J	6.7
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.52 U	0.66 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.8 U	0.14 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.4 J	4.9 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.2 J	2.4 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.7 J	4.3 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	6.0	13
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	17	37
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	320 J	1200 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	71 J	170 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	45 J	93 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	55 J	110 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	2.2 J	3.9 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	41 J	61 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	14 J	21 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	66 J	110 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	11.9	30.9
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	12.8	31.0

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB063**	**SJSB063**
	Sample Name:	**11187072-091619-BN-SJSB063-S (4-6)**	**11187072-091619-BN-SJSB063-S (6-8)**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	6200	7200 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	83	43
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	590	1200
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	39	21
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	3.8 J	3.0 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.7 J	0.32 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.6 J	2.4 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	12	39
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.3 J	1.6 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	6.0 J	15
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.27 U	0.27 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.69 U	1.0 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.93 J	0.62 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.1 J	0.63 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.2 J	0.73 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	2.3	0.50 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	8.6	4.1
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1100 J	2000 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	130 J	81 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	87 J	260 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	52 J	39 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.8 J	11 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	21 J	16 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	7.7 J	3.1 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	38 J	22 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	14.4	22.4
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	14.8	22.5

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB063**	**SJSB063**
	Sample Name:	**11187072-091619-BN-SJSB063-S (8-10)**	**11187072-091619-BN-DUP2**
	Sample Date:	**09/16/2019**	**09/16/2019**
	Depth:	**8-10 ft BGS**	**8-10 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	1500	1800
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	15 J	3.1 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	110	56
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	7.2 J	0.68 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.89 J	0.17 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.61 J	0.078 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.90 J	0.084 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.9 J	1.3 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.91 J	0.082 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	2.8 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.16 U	0.11 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.26 U	0.51 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.32 J	0.16 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.32 J	0.091 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.50 J	0.094 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.3 J	1.0 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	4.3 J	1.9
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	220 J	170 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	25 J	1.4 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	28 J	41 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	15 J	0.37 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.7 J	9.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	11 J	0.56 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.8 J	6.1 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	23 J	8.0 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	4.29	3.22
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	4.43	3.26

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB064**	**SJSB064**
	Sample Name:	**11187072-100719-BN-SJSB064-S(0-2)**	**11187072-100719-BN-SJSB064-S(2-4)**
	Sample Date:	**10/07/2019**	**10/07/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	330	800
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	38	23
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	28	48
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	18	7.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.46 J	0.82 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.43 U	0.63 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.1 J	1.5 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.8 J	1.5 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.62 J	0.87 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.93 J	1.2 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.21 J	0.14 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.24 J	0.27 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.52 J	1.2 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.53 J	0.74 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.54 J	1.6 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.9	0.40 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	14	6.6
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	73 J	99 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	32 J	21 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	15 J	12 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	12 J	12 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.7 J	1.8 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	4.9 J	13 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.8 J	0.40 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	24 J	20 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	6.81	3.25
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	6.83	3.28

Notes:

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Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB064**	**SJSB064**
	Sample Name:	**11187072-100719-BN-SJSB064-S(4-6)**	**11187072-100719-BN-SJSB064-S(6-8)**
	Sample Date:	**10/07/2019**	**10/07/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	12000	27000
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	140	250
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	590	1800
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	59	120
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	4.3 J	7.4 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	4.4 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.4 J	9.1 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	12	100
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	5.7 J	4.6 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	5.3 J	36 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.65 J	0.99 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.0 J	4.7 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.3 J	8.4 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	3.0 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.0 J	8.8 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	2.7	200
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	9.5	740
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1200 J	4300 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	200 J	390 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	94 J	920 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	81 J	220 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	8.9 J	89 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	21 J	95 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.7 J	240 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	24 J	1100 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	18.2	324
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	18.2	325

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB064**	**SJSB064**
	Sample Name:	**11187072-100719-BN-SJSB064-S(8-10)**	**11187072-100719-BN-DUP2A**
	Sample Date:	**10/07/2019**	**10/07/2019**
	Depth:	**8-10 ft BGS**	**8-10 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	7300 J	280 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	160 J	5.2 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	590 J	18 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	56 J	1.1 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	3.8 J	0.71 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.6 J	0.57 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	4.9 J	0.27 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	17 J	0.74 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.2 J	0.24 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	9.9	1.0 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.27 J	0.32 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	2.5 J	0.20 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.2 J	0.12 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.0 J	0.27 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.4 J	0.074 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	8.1 J	0.20 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	35 J	0.49 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1100 J	55 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	210 J	3.3 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	180 J	19 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	80 J	1.8 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	32 J	4.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	34 J	0.29 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	18 J	4.0 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	77 J	1.1 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	27.7	1.02
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	27.7	1.06

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	SJSB065	SJSB065
	Sample Name:	11187072-091219-BN-SJSB065-S(0-2)	11187072-091219-BN-SJSB065-S(2-4)
	Sample Date:	09/12/2019	09/12/2019
	Depth:	0-2 ft BGS	2-4 ft BGS
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	8600	2500
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	150 J	58
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	350	150
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	57 J	110
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	4.5 J	38
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	5.3 J	1.4 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	30 J	400
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	10 J	4.2 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	10 J	110
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	10 U	1.4 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	2.4 U	7.0 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.1 U	26
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	18 U	370
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.6 U	12
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	12 J	220
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	130	3900 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	450	10000 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	760 J	290 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	180 J	190 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	100 J	39 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	88 J	610 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.1 U	33 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	65 J	940 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	150 J	4300 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	680 J	24000 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	191	5060
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	194	5060

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB065**	**SJSB065**
	Sample Name:	**11187072-091219-BN-SJSB065-S(4-6)**	**11187072-091219-BN-SJSB065-S(6-8)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2200	120
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	39	4.8 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	100	4.8 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	65	1.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	24	0.29 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.66 J	0.21 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	260	1.2 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.9 J	0.22 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	64	0.31 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.3 J	0.45 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	5.2 J	0.37 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	21	0.36 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	250	0.26 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	6.8	0.12 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	160	0.28 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3200 J	8.2
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	8200 J	19
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	200 J	18 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	120 J	1.0 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	25 J	8.9 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	390 J	1.9 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	28 J	1.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	670 J	0.68 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3500 J	9.6 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	19000 J	37 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	4130	10.3
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	4130	10.6

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB065**	**SJSB065**
	Sample Name:	**11187072-091219-BN-SJSB065-S(8-10)**	**11187072-091219-BN-DUP1**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**8-10 ft BGS**	**8-10 ft BGS**
			Duplicate
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	84	79
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.31 U	0.60 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	3.7 J	3.7 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.20 U	0.15 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.20 U	0.18 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.19 U	0.21 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.13 U	0.13 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.21 U	0.21 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.13 U	0.13 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.19 U	0.19 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.083 U	0.42 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.34 U	0.32 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.24 U	0.22 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.098 U	0.098 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.27 U	0.24 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.43 J	0.51 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1.0 U	0.91 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	13 J	13 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.20 U	0.18 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	4.5 J	3.8 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.13 U	0.42 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.34 U	0.42 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.27 U	0.24 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.7 J	1.3 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3.3 J	1.2 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	0.492	0.571
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	0.810	0.887

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB065-C1**	**SJSB065-C1**
	Sample Name:	**11187072-100919-BN-SJSB065-C1-5(0-2)**	**11187072-100919-BN-SJSB065-C1-5(2-4)**
	Sample Date:	**10/09/2019**	**10/09/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	640	1200
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	14	41
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	39	88
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	21	82
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	7.4	34
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.48 U	0.65 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	74	280
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.1 J	2.3 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	18	66
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	1.4 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	1.4 J	4.7 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	3.9 J	14
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	51	180
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.9 J	6.3
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	28	100
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	600	2000
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2000	5300
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	97 J	180 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	36 J	150 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	41 J	27 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	110 J	410 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	15 J	23 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	130 J	460 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	650 J	2200 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3300 J	11000 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	825	2620
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	825	2620

Notes:

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U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB065-C1**	**SJSB065-C1**
	Sample Name:	**11187072-100919-BN-SJSB065-C1-5(4-6)**	**11187072-100919-BN-SJSB065-C1-5(6-8)**
	Sample Date:	**10/09/2019**	**10/09/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	710	540
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	28	9.2 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	55	38
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	34	16
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	14	7.3
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.52 U	0.49 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	160	97
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.6 J	1.2 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	39	24
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.1 J	1.6 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	2.8 J	2.1 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	9.0	6.5
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	130	130
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	4.1 J	3.4 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	70	66
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1500	1000
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	4000	2900
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130 J	94 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	67 J	32 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	26 J	24 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	240 J	150 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	16 J	13 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	310 J	310 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1700 J	1100 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	7600 J	5100 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1960	1330
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1960	1330

Notes:

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Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB065-C1**	**SJSB066**
	Sample Name:	**11187072-100919-BN-SJSB065-C1-5(8-10)**	**11187072-100819-BN-SJSB066-S (0-2)**
	Sample Date:	**10/09/2019**	**10/08/2019**
	Depth:	**8-10 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	72	380
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.93 U	31
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	3.1 J	29
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.18 U	13
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.14 J	4.2 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.28 U	0.29 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.29 J	36
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.19 J	0.95 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.13 J	9.2 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.32 J	0.039 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.17 J	0.65 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.10 U	2.3 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.32 J	21
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.058 U	1.2 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.092 U	14
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	2.1	200
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	7.7	490
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	11 J	62 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.33 J	25 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	3.7 J	13 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.59 J	57 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.25 J	5.5 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.32 J	60 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	2.9 J	220 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	14 J	1200 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	3.04	262
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	3.13	262

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB066**	**SJSB066**
	Sample Name:	**11187072-100819-BN-SJSB066-S (2-4)**	**11187072-100819-BN-SJSB066-S (4-6)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	20000	3800
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	1700	5100
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	1600	250
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	4600	160
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1800	14
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	7.1 J	3.3 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	20000	36 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	52 J	14
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	4700	9.3
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	17 J	9.4
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	340	0.98 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	520	3.8 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	10000	17
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	500	4.1 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	4800	13
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	38000 J	210
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	210000 J	580
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	3000 J	650 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	7700 J	320 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	390 J	140 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	28000 J	170 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	690 J	38 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	25000 J	170 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	42000 J	250 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	360000 J	1400 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	63900	291
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	63900	291

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB066**	**SJSB066**
	Sample Name:	**11187072-100819-BN-SJSB066-S (6-8)**	**11187072-100819-BN-SJSB066-S (8-10)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	460	230
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	270	23
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	27	13
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	9.2	1.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.1 J	0.15 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.49 J	0.061 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	2.5 J	0.58 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.2 J	0.063 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.0 J	0.14 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.3 J	1.3 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.10 U	0.085 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.45 U	0.16 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.4 J	0.29 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.33 J	0.070 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.1 J	0.27 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	16	1.9
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	52	6.4
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	93 J	45 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	19 J	2.2 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	55 J	15 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	12 J	1.1 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	12 J	3.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	16 J	1.9 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	29 J	5.4 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	120 J	14 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	22.9	3.05
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	23.2	3.14

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB066-C1**	**SJSB067**
	Sample Name:	**11187072-091219-BN-SJSB066-CI-S(2-4)**	**11187072-091219-BN-SJSB067-S(2-4)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**2-4 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	380	990
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	29	27
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	35	73
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	9.7	40
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	1.9 J	15
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.76 J	0.59 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	12	160
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.3 J	1.9 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	3.9 J	40
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.9 J	1.7 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.24 U	2.6 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.0 J	10
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	7.5	140
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.58 J	4.6 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	4.7 J	84
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	81	1600 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	240	5100 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	72 J	140 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	17 J	75 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	20 J	31 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	24 J	240 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.1 J	16 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	24 J	360 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	92 J	1700 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	430 J	8600 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	110	2170
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	110	2170

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB066-C1**	**SJSB066-C1**
	Sample Name:	**11187072-091219-BN-SJSB066-CI-S(4-6)**	**11187072-091219-BN-SJSB066-CI-S(6-8)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	380	120
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	13	0.32 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	14	5.8 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.8 J	0.21 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.28 U	0.22 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.32 U	0.25 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	0.17 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.33 U	0.25 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.51 J	0.19 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.92 J	0.71 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.16 U	0.11 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.26 U	0.25 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	2.0 J	0.15 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.19 U	0.12 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.88 J	0.16 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	10	0.19 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	30	0.88 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	49 J	20 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	2.9 J	0.22 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	12 J	6.9 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2.1 J	0.19 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.7 J	0.81 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	3.9 J	0.16 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	12 J	2.1 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	53 J	3.7 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	13.9	0.253
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	14.1	0.558

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

Parameters	Unit		
	Location ID:	SJSB066-C1	SJSB066-C1
	Sample Name:	11187072-091219-BN-SJSB066-CI-S(8-10)	11187072-091219-BN-SJSB066-CI-S(0-2)
	Sample Date:	09/12/2019	09/12/2019
	Depth:	8-10 ft BGS	0-2 ft BGS
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2900	1400
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.25 U	110
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	64	120
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.21 U	23
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.23 U	2.2 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.1 J	1.8 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.21 U	8.9
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.3 J	4.2 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.24 U	3.9 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.9 J	3.8 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.23 J	0.25 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.32 U	0.69 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.39 J	4.5 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.15 U	0.96 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.21 U	2.6 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.19 U	38
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.44 J	140
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	190 J	220 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.23 U	58 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	41 J	37 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.23 J	29 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	6.3 J	3.8 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	1.3 J	15 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	5.1 J	43 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	3.5 J	230 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	2.12	57.9
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	2.44	57.9

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB067**	**SJSB067**
	Sample Name:	**11187072-091219-BN-SJSB067-S(0-2)**	**11187072-091219-BN-SJSB067-S(4-6)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**0-2 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	4500	160
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	5.4 J	0.26 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	35	10
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.6 J	0.26 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.27 U	0.25 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.58 J	0.56 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.62 J	0.16 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.70 J	0.39 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.42 J	0.16 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.0 U	1.4 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.70 U	0.67 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.31 U	0.35 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.28 U	1.2 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.18 J	0.12 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.27 U	0.28 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.5	2.0
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	5.4	6.3
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	91 J	32 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	4.3 J	0.26 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	13 J	13 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	3.5 J	0.67 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.34 J	3.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.37 J	3.4 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.6 J	9.4 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	8.0 J	32 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	4.01	3.01
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	4.29	3.31

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB067**	**SJSB067**
	Sample Name:	**11187072-091219-BN-SJSB067-S(6-8)**	**11187072-091219-BN-SJSB067-S(8-10)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	110	88
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.54 J	0.24 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	7.9	6.1 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.21 U	0.18 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.25 U	0.20 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.57 J	0.42 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.18 U	0.15 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.63 J	0.30 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.19 U	0.16 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.2 U	0.86 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.56 U	0.44 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.38 U	0.31 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.3 U	1.8 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.14 U	0.11 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.68 J	0.83 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.34 J	0.50 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2.6	5.8
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	25 J	20 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.25 U	0.20 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	10 J	8.0 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.56 J	0.61 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.9 J	3.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	3.8 J	6.5 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.3 J	7.3 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	21 J	54 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.04	1.50
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.36	1.77

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB067-C1**	**SJSB067-C1**
	Sample Name:	**11187072-091219-BN-SJSB067-CI-S(2-4)**	**11187072-091219-BN-SJSB067-CI-S(4-6)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	150	100
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.53 U	0.38 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	7.6	5.8 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.21 U	0.087 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.051 U	0.088 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.28 U	0.36 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.28 J	0.11 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.27 J	0.35 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.11 J	0.10 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.73 J	0.70 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.15 U	0.24 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.17 J	0.25 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.18 J	0.19 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.041 U	0.041 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.15 J	0.064 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.90 J	0.17 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2.5	0.50 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	28 J	20 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.34 J	0.18 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	11 J	6.5 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.54 J	0.45 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	2.4 J	1.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.33 J	0.19 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	4.5 J	1.8 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	14 J	3.2 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.63	0.690
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.66	0.732

Notes:

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Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB067-C1**	**SJSB067-C1**
	Sample Name:	**11187072-091219-BN-SJSB067-CI-S(6-8)**	**11187072-091219-BN-SJSB067-CI-S(8-10)**
	Sample Date:	**09/12/2019**	**09/12/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	100	100
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.35 U	0.27 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	5.2 J	5.4 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.11 U	0.10 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.040 U	0.093 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.31 U	0.24 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.040 U	0.039 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.23 J	0.26 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.057 J	0.057 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.68 J	0.68 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 U	0.11 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.087 U	0.15 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.053 U	0.042 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.041 U	0.032 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.055 U	0.045 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.11 J	0.059 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.14 U	0.14 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	18 J	23 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.11 J	0.19 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	6.4 J	12 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.21 J	0.17 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.6 J	4.0 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.064 U	0.053 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	2.3 J	8.7 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	0.69 J	0.35 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	0.289	0.334
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	0.375	0.400

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB067-C1**	**SJSB068**
	Sample Name:	**11187072-091219-BN-SJSB067-CI-S(0-2)**	**11187072-100819-BN-SJSB068-S (0-2)**
	Sample Date:	**09/12/2019**	**10/08/2019**
	Depth:	**0-2 ft BGS**	**0-2 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	2900	890
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	22	93
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	61	53
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	17	37
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	5.1 J	15
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.63 U	0.099 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	45	140
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.7 J	1.6 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	11	30
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.3 J	2.3 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.94 J	3.0 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	1.9 J	3.5 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	25	60
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.7 J	3.1 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	11	25
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	120	230
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	550	650
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	130 J	140 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	35 J	77 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	18 J	33 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	71 J	210 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	5.5 J	9.9 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	60 J	130 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	140 J	270 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	910 J	1300 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	189	327
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	189	327

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB068**	**SJSB068**
	Sample Name:	**11187072-100819-BN-SJSB068-S (2-4)**	**11187072-100819-BN-SJSB068-S (4-6)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	240	330
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	2.1 U	0.92 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	16	17
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.47 J	0.27 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.18 U	0.041 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.054 U	0.13 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.88 J	0.18 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.057 U	0.14 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.23 J	0.044 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.0 J	0.13 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.16 J	0.13 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.37 U	0.31 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.37 J	0.20 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.056 U	0.043 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.16 J	0.051 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.80 J	0.12 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	2.2	1.1 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	58 J	66 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.87 J	0.35 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	24 J	40 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	1.3 J	0.31 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	5.9 J	10 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	1.0 J	0.90 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	6.7 J	28 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	9.3 J	6.8 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.64	0.416
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.84	0.665

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	SJSB068	SJSB068
	Sample Name:	11187072-100819-BN-SJSB068-S (6-8)	11187072-100819-BN-SJSB068-S (8-10)
	Sample Date:	10/08/2019	10/08/2019
	Depth:	6-8 ft BGS	8-10 ft BGS
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	400	180
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.42 U	0.39 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	25	11
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.28 U	0.26 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.036 U	0.027 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.12 U	0.067 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.075 U	0.19 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.13 U	0.069 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.071 U	0.045 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.12 U	1.3 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.088 U	0.057 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.46 U	0.24 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.24 J	0.32 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.071 U	0.047 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.037 U	0.20 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.10 U	0.081 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.73 J	0.88 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	85 J	38 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.28 J	0.26 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	30 J	14 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.088 U	0.31 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	7.6 J	3.2 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	1.2 J	1.1 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	5.8 J	3.0 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	5.9 J	5.9 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	0.450	0.552
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	0.771	0.687

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB068-C1**	**SJSB068-C1**
	Sample Name:	**11187072-100819-BN-SJSB068-C1-S (0-2)**	**11187072-100819-BN-SJSB068-C1-S (2-4)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**0-2 ft BGS**	**2-4 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	1200	1100
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	10 J	680
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	26	52
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	1.5 J	21
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.18 J	3.2 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.45 J	0.75 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.58 J	4.4 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.57 J	2.2 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.28 J	1.6 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.5 J	2.5 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.071 U	0.15 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.41 J	0.84 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.36 J	2.3 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.058 U	0.50 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.39 J	2.1 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.4	32
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	8.3	100
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	94 J	150 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	4.4 J	46 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	36 J	43 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2.9 J	28 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	6.7 J	8.8 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	3.8 J	44 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	11 J	42 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	21 J	220 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	5.75	46
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	5.75	46

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB068-C1**	**SJSB068-C1**
	Sample Name:	**11187072-100819-BN-SJSB068-C1-S (4-6)**	**11187072-100819-BN-SJSB068-C1-S (6-8)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**4-6 ft BGS**	**6-8 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	20000 J	9000 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	10 J	13000 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	100	550
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	2.5 J	310
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.23 J	36
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.90 J	7.5
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.28 J	57
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.3 J	28
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.070 U	18 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.6 J	20
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.097 U	1.5 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.47 J	10 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.11 U	31
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.082 U	6.4 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.10 U	28
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.36 J	480
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	0.81 J	1100
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	240 J	1300 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	6.4 J	660 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	25 J	300 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	2.7 J	320 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	4.6 J	76 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.85 J	410 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	3.1 J	570 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	2.4 J	3000 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	8.35	638
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	8.38	639

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

Parameters	Unit	SJSB068-C1	SJSB069
Location ID:		SJSB068-C1	SJSB069
Sample Name:		11187072-100819-BN-SJSB068-C1-S (8-10)	11187072-100819-BN-SJSB069-S (0-2)
Sample Date:		10/08/2019	10/08/2019
Depth:		8-10 ft BGS	0-2 ft BGS
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	700	2200
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	270	99
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	32	200
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	7.5	43
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.56 J	5.5 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.63 J	2.4 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	1.6 J	24
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	1.3 J	5.7 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.67 J	7.7 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.6 J	6.9
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.12 U	0.46 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.56 J	1.9 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.96 J	8.4
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.10 U	2.7 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.61 J	6.5
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	11	50
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	37	170
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	110 J	660 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	16 J	95 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	39 J	94 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	10 J	80 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	7.3 J	12 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	18 J	49 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	21 J	62 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	77 J	320 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	16.8	79.3
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	16.9	79.3

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB069**	**SJSB069**
	Sample Name:	**11187072-100819-BN-SJSB069-S (2-4)**	**11187072-100819-BN-SJSB069-S (4-6)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**2-4 ft BGS**	**4-6 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	260	300
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	2.4 U	1.4 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	18	17
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.69 J	0.35 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.13 U	0.079 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.10 U	0.96 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.42 J	0.14 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.11 U	1.1 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.20 J	0.14 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.10 U	1.9 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.063 U	0.10 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.32 U	0.37 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.29 J	0.28 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.052 U	0.041 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.19 J	0.046 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	1.9 J	0.17 J
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	7.5	1.0 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	70 J	54 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	1.7 J	0.59 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	26 J	18 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	1.0 J	0.38 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	6.7 J	4.1 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	0.75 J	1.6 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	11 J	5.5 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	15 J	8.8 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	3.04	1.04
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	3.22	1.20

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit

Table 2

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event
San Jacinto, Harris County, Texas
September through November 2019

	Location ID:	**SJSB069**	**SJSB069**
	Sample Name:	**11187072-100819-BN-SJSB069-S (6-8)**	**11187072-100819-BN-SJSB069-S (8-10)**
	Sample Date:	**10/08/2019**	**10/08/2019**
	Depth:	**6-8 ft BGS**	**8-10 ft BGS**
Parameters	**Unit**		
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)			
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/g	350	180
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/g	0.59 U	0.34 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	25	9.7
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/g	0.19 U	0.22 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/g	0.078 U	0.046 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.62 U	0.078 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.29 J	0.049 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	0.99 J	0.086 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.24 J	0.052 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	2.7 J	1.0 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/g	0.20 J	0.064 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	0.58 J	0.20 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	1.0 J	0.040 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/g	0.045 U	0.054 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/g	0.40 J	0.037 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	0.21 J	0.089 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/g	1.6 J	0.29 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/g	82 J	71 J
Total heptachlorodibenzofuran (HpCDF)	pg/g	0.19 J	0.22 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/g	29 J	35 J
Total hexachlorodibenzofuran (HxCDF)	pg/g	0.92 J	0.064 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/g	6.4 J	7.5 J
Total pentachlorodibenzofuran (PeCDF)	pg/g	8.7 J	0.040 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/g	7.7 J	8.7 J
Total tetrachlorodibenzofuran (TCDF)	pg/g	22 J	0.88 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/g	1.90	0.251
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/g	1.93	0.437

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

Table 3

Analytical Methods
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Method	Matrix	Holding Time Collection or Extraction to Analysis (Days)
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)	E1613	Soil	360

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	Extraction Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Dioxins and Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	09/18/2019	0.157J	11187072-091619-BN-SJSB062-S (4-6)	0.90 J	0.90 U	pg/g
				11187072-091619-BN-SJSB062-S (6-8)	0.15 J	0.15 U	pg/g
				11187072-091619-BN-SJSB062-S (8-10)	0.14 J	0.14 U	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	09/18/2019	0.611J	11187072-091619-BN-SJSB062-S (6-8)	0.14 J	0.14 U	pg/g
				11187072-091619-BN-SJSB062-S (8-10)	0.11 J	0.11 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	09/18/2019	0.0822J	11187072-091619-BN-DUP2	0.17 J	0.17 U	pg/g
				11187072-091619-BN-DUP3	0.29 J	0.29 U	pg/g
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	09/17/2019	0.220J	11187072-091219-BN-SJSB067-S(0-2)	0.70 J	0.70 U	pg/g
				11187072-091219-BN-SJSB065-S(6-8)	0.37 J	0.37 U	pg/g
				11187072-091219-BN-DUP1	0.42 J	0.42 U	pg/g
				11187072-091219-BN-SJSB067-S(4-6)	0.67 J	0.67 U	pg/g
				11187072-091219-BN-SJSB067-S(6-8)	0.56 J	0.56 U	pg/g
				11187072-091219-BN-SJSB067-S(8-10)	0.44 J	0.44 U	pg/g
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	09/17/2019	0.202J	11187072-091219-BN-SJSB067-S(0-2)	1.0 J	1.0 U	pg/g
				11187072-091219-BN-SJSB065-S(0-2)	10 J	10 U	pg/g
				11187072-091219-BN-SJSB065-S(6-8)	0.45 J	0.45 U	pg/g
				11187072-091219-BN-SJSB067-S(6-8)	1.2 J	1.2 U	pg/g
				11187072-091219-BN-SJSB067-S(8-10)	0.86 J	0.86 U	pg/g
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	09/17/2019	0.355J	11187072-091219-BN-SJSB065-S(0-2)	18 J	18 U	pg/g
				11187072-091219-BN-SJSB067-S(4-6)	1.2 J	1.2 U	pg/g
				11187072-091219-BN-SJSB067-S(6-8)	1.3 J	1.3 U	pg/g
				11187072-091219-BN-SJSB067-S(8-10)	1.8 J	1.8 U	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	09/17/2019	0.166J	11187072-091219-BN-SJSB065-S(8-10)	1.0 J	1.0 U	pg/g
				11187072-091219-BN-DUP1	0.91 J	0.91 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/07/2019	0.243J	11187072-091219-BN-SJSB067-CI-S(2-4)	0.53 J	0.53 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(4-6)	0.38 J	0.38 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(6-8)	0.35 J	0.35 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.27 J	0.27 U	pg/g

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	Extraction Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Dioxins and Furans	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	10/07/2019	0.0991J	11187072-091219-BN-SJSB067-CI-S(2-4)	0.21 J	0.21 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(4-6)	0.087 J	0.087 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(6-8)	0.11 J	0.11 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.10 J	0.10 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	10/07/2019	0.0815J	11187072-091219-BN-SJSB067-CI-S(4-6)	0.088 J	0.088 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.093 J	0.093 U	pg/g
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	10/07/2019	0.152J	11187072-091219-BN-SJSB067-CI-S(0-2)	0.63 J	0.63 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(2-4)	0.28 J	0.28 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(4-6)	0.36 J	0.36 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(6-8)	0.31 J	0.31 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.24 J	0.24 U	pg/g
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	10/07/2019	0.0731J	11187072-091219-BN-SJSB067-CI-S(2-4)	0.15 J	0.15 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(4-6)	0.24 J	0.24 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(6-8)	0.12 J	0.12 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.11 J	0.11 U	pg/g
	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	10/07/2019	0.0316J	11187072-091219-BN-SJSB067-CI-S(6-8)	0.041 J	0.041 U	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	10/07/2019	0.0736J	11187072-091219-BN-SJSB067-CI-S(6-8)	0.14 J	0.14 U	pg/g
				11187072-091219-BN-SJSB067-CI-S(8-10)	0.14 J	0.14 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/10/2019	0.255J	11187072-100819-BN-SJSB068-S (8-10)	0.39 J	0.39 U	pg/g
				11187072-100819-BN-SJSB069-S (2-4)	2.4 J	2.4 U	pg/g
				11187072-100819-BN-SJSB068-S (2-4)	2.1 J	2.1 U	pg/g
				11187072-100819-BN-SJSB068-S (4-6)	0.92 J	0.92 U	pg/g
				11187072-100819-BN-SJSB068-S (6-8)	0.42 J	0.42 U	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	10/10/2019	0.0529J	11187072-100819-BN-SJSB068-S (8-10)	0.26 J	0.26 U	pg/g
				11187072-100819-BN-SJSB068-S (4-6)	0.27 J	0.27 U	pg/g
				11187072-100819-BN-SJSB068-S (6-8)	0.28 J	0.28 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	10/10/2019	0.0650J	11187072-100819-BN-SJSB069-S (2-4)	0.13 J	0.13 U	pg/g
				11187072-100819-BN-SJSB066-S (8-10)	0.15 J	0.15 U	pg/g
				11187072-100819-BN-SJSB068-S (2-4)	0.18 J	0.18 U	pg/g

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	Extraction Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Dioxins and Furans	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	10/10/2019	0.0981J	11187072-100819-BN-SJSB068-S (8-10)	0.24 J	0.24 U	pg/g
				11187072-100819-BN-SJSB069-S (2-4)	0.32 J	0.32 U	pg/g
				11187072-100819-BN-SJSB066-S (6-8)	0.45 J	0.45 U	pg/g
				11187072-100819-BN-SJSB066-S (8-10)	0.16 J	0.16 U	pg/g
				11187072-100819-BN-SJSB068-S (2-4)	0.37 J	0.37 U	pg/g
				11187072-100819-BN-SJSB068-S (4-6)	0.31 J	0.31 U	pg/g
				11187072-100819-BN-SJSB068-S (6-8)	0.46 J	0.46 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/10/2019	0.589J	11187072-100819-BN-SJSB069-S (4-6)	1.4 J	1.4 U	pg/g
				11187072-100819-BN-SJSB069-S (6-8)	0.59 J	0.59 U	pg/g
				11187072-100819-BN-SJSB069-S (8-10)	0.34 J	0.34 U	pg/g
				11187072-100819-BN-SJSB060-S (4-6)	1.1 J	1.1 U	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	10/10/2019	0.123J	11187072-100819-BN-SJSB069-S (4-6)	0.35 J	0.35 U	pg/g
				11187072-100819-BN-SJSB069-S (6-8)	0.19 J	0.19 U	pg/g
				11187072-100819-BN-SJSB069-S (8-10)	0.22 J	0.22 U	pg/g
				11187072-100819-BN-SJSB060-S (4-6)	0.60 J	0.60 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	10/10/2019	0.102J	11187072-100819-BN-SJSB060-S (2-4)	1.0 J	1.0 U	pg/g
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	10/10/2019	0.0478J	11187072-100819-BN-SJSB069-S (8-10)	0.20 J	0.20 U	pg/g
				11187072-100819-BN-SJSB060-S (4-6)	0.52 J	0.52 U	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	10/10/2019	0.172J	11187072-100819-BN-SJSB069-S (4-6)	1.0 J	1.0 U	pg/g
				11187072-100819-BN-SJSB069-S (8-10)	0.29 J	0.29 U	pg/g
				11187072-100819-BN-DUP4	1.6 J	1.6 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/23/2019	1.08J	11187072-100819-BN-SJSB060-C1-S (2-4)	4.2 J	4.2 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	10/23/2019	0.0940J	11187072-100819-BN-SJSB060-C1-S (2-4)	0.090 J	0.090 U	pg/g
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	10/23/2019	0.0971J	11187072-100819-BN-SJSB060-C1-S (0-2)	0.38 J	0.38 U	pg/g
				11187072-100819-BN-SJSB060-C1-S (2-4)	0.33 J	0.33 U	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	10/23/2019	0.256J	11187072-100819-BN-SJSB060-C1-S (0-2)	0.78 J	0.78 U	pg/g
				11187072-100819-BN-SJSB060-C1-S (2-4)	0.99 J	0.99 U	pg/g

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	Extraction Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Dioxins and Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/15/2019	0.48J	11187072-101219-BN-SJSB059-S (2-4)	2.8 J	2.8 U	pg/g
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	10/10/2019	0.139J	11187072-100719-BN-SJSB064-S(0-2)	0.43 J	0.43 U	pg/g
				11187072-100719-BN-SJSB064-S(2-4)	0.63 J	0.63 U	pg/g
				11187072-100719-BN-SJSB064-S(6-8)	4.4 J	4.4 U	pg/g
				11187072-100719-BN-DUP2A	0.57 J	0.57 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	10/14/2019	0.194J	11187072-100919-BN-SJSB065-C1-5(8-10)	0.93 J	0.93 U	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	10/14/2019	0.0785J	11187072-100919-BN-SJSB065-C1-5(8-10)	0.18 J	0.18 U	pg/g
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	10/14/2019	0.215J	11187072-100919-BN-SJSB065-C1-5(0-2)	0.48 J	0.48 U	pg/g
				11187072-100919-BN-SJSB065-C1-5(2-4)	0.65 J	0.65 U	pg/g
				11187072-100919-BN-SJSB065-C1-5(4-6)	0.52 J	0.52 U	pg/g
				11187072-100919-BN-SJSB065-C1-5(6-8)	0.49 J	0.49 U	pg/g
				11187072-100919-BN-SJSB065-C1-5(8-10)	0.28 J	0.28 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	12/04/2019	0.941J	11187072-112319-SS-DUP-1	4.3 J	4.3 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	12/04/2019	0.0492J	11187072-112519-SS-SJSB061-C2(2-4)	0.29 J	0.29 U	pg/g
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	12/04/2019	0.124J	11187072-112519-SS-SJSB061-C2(0-2)	0.38 J	0.38 U	pg/g
				11187072-112519-SS-SJSB061-C2(2-4)	0.089 J	0.089 U	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2019	0.179J	11187072-112419-NG-SJSB060-C3(4-6)	0.81 J	0.81 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.80 J	0.80 U	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2019	0.0743J	11187072-112419-NG-SJSB060-C3(4-6)	0.33 J	0.33 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.25 J	0.25 U	pg/g
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2019	0.103J	11187072-112419-NG-SJSB060-C2(4-6)	0.47 J	0.47 U	pg/g
				11187072-112419-NG-SJSB060-C2(6-8)	0.20 J	0.20 U	pg/g
				11187072-112419-NG-SJSB060-C2(8-10)	0.17 J	0.17 U	pg/g
				11187072-112419-NG-SJSB060-C3(6-8)	0.17 J	0.17 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.086 J	0.086 U	pg/g

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	Extraction Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Dioxins and Furans	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2019	0.197J	11187072-112419-NG-SJSB060-C3(0-2)	0.90 J	0.90 U	pg/g
				11187072-112419-NG-SJSB060-C2(4-6)	0.48 J	0.48 U	pg/g
				11187072-112419-NG-SJSB060-C2(6-8)	0.32 J	0.32 U	pg/g
				11187072-112419-NG-SJSB060-C2(8-10)	0.35 J	0.35 U	pg/g
				11187072-112419-NG-SJSB060-C3(2-4)	0.81 J	0.81 U	pg/g
				11187072-112419-NG-SJSB060-C3(4-6)	0.33 J	0.33 U	pg/g
				11187072-112419-NG-SJSB060-C3(6-8)	0.73 J	0.73 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.26 J	0.26 U	pg/g
	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2019	0.121J	11187072-112419-NG-SJSB060-C2(6-8)	0.29 J	0.29 U	pg/g
				11187072-112419-NG-SJSB060-C2(8-10)	0.20 J	0.20 U	pg/g
				11187072-112419-NG-SJSB060-C3(2-4)	0.23 J	0.23 U	pg/g
				11187072-112419-NG-SJSB060-C3(4-6)	0.21 J	0.21 U	pg/g
				11187072-112419-NG-SJSB060-C3(6-8)	0.19 J	0.19 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.20 J	0.20 U	pg/g
				11187072-112419-NG-Dup 2	0.32 J	0.32 U	pg/g
	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2019	0.178J	11187072-112419-NG-SJSB060-C3(0-2)	0.60 J	0.60 U	pg/g
				11187072-112419-NG-SJSB060-C2(6-8)	0.63 J	0.63 U	pg/g
				11187072-112419-NG-SJSB060-C2(8-10)	0.40 J	0.40 U	pg/g
				11187072-112419-NG-SJSB060-C3(2-4)	1.0 J	1.0 U	pg/g
				11187072-112419-NG-SJSB060-C3(4-6)	0.25 J	0.25 U	pg/g
				11187072-112419-NG-SJSB060-C3(6-8)	0.27 J	0.27 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.18 J	0.18 U	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2019	0.166J	11187072-112419-NG-SJSB060-C3(4-6)	0.52 J	0.52 U	pg/g
				11187072-112419-NG-SJSB060-C3(6-8)	0.46 J	0.46 U	pg/g
				11187072-112419-NG-SJSB060-C3(8-10)	0.23 J	0.23 U	pg/g

Notes:

* - Blank result adjusted for sample factors where applicable
U - Not detected at the associated reporting limit
J - Estimated concentration

Table 5

Qualified Sample Data Due to Outlying of Surrogate Ion Abundance Ratios
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Surrogate	Surrogate IAR	Control Limits IAR	Analyte	Qualified Result	Units
Dioxins and Furans	11187072-100819-BN-SJSB060-C1-S (6-8)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) C13	1.57	1.05-1.43	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.8 J	pg/g
		1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF) C13	0.60	0.43-0.59	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	340 J	pg/g
Dioxins and Furans	11187072-100819-BN-SJSB060-S (6-8)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF) C13	0.61	0.43-0.59	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	210 J	pg/g

Notes:

J - Estimated concentration
IAR - Ion Abundance Ratio

Table 6

Qualified Sample Results Due to Outlying MS/MSD Results
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Qualified Result	Units
Dioxins and Furans	11187072-091619-BN-SJSB061-S (8-10)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0	0	0	75-158	25	74 J	pg/g
		2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	57	31	20	67-158	25	25.0 J	pg/g
Dioxins and Furans	11187072-100719-BN-SJSB064-S(8-10)	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	204	241	9	63-170	25	160 J	pg/g
		1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	166	167	1	82-122	25	56 J	pg/g
		2,3,7,8-Tetrachlorodibenzofuran (TCDF)	318	251	12	75-158	25	35 J	pg/g

Notes:

MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
J - Estimated concentration

Table 7

Qualified Sample Data Due to Variability in Field Duplicate Results
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Analyte	RPD/Diff	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	144	11187072-091619-BN-SJSB061-S (8-10)	74 J	11187072-091619-BN-DUP3	12 J	pg/g
	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	143	11187072-091619-BN-SJSB061-S (8-10)	25 J	11187072-091619-BN-DUP3	4.2 J	pg/g
Dioxins and Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	187	11187072-100719-BN-SJSB064-S(8-10)	160 J	11187072-100719-BN-DUP2A	5.2 J	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	185	11187072-100719-BN-SJSB064-S(8-10)	7300 J	11187072-100719-BN-DUP2A	280 J	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	192	11187072-100719-BN-SJSB064-S(8-10)	56 J	11187072-100719-BN-DUP2A	1.1 J	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	188	11187072-100719-BN-SJSB064-S(8-10)	590 J	11187072-100719-BN-DUP2A	18 J	pg/g
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	183	11187072-100719-BN-SJSB064-S(8-10)	17 J	11187072-100719-BN-DUP2A	0.74 J	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	195	11187072-100719-BN-SJSB064-S(8-10)	35 J	11187072-100719-BN-DUP2A	0.49 J	pg/g
	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	190	11187072-100719-BN-SJSB064-S(8-10)	8.1 J	11187072-100719-BN-DUP2A	0.20 J	pg/g
Dioxins and Furans	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	135	11187072-112419-NG-SJSB060-C3(0-2)	24 J	11187072-112419-NG-Dup 2	94 J	pg/g
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	119	11187072-112419-NG-SJSB060-C3(0-2)	740 J	11187072-112419-NG-Dup 2	3800 J	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	129	11187072-112419-NG-SJSB060-C3(0-2)	10 J	11187072-112419-NG-Dup 2	46 J	pg/g
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	104	11187072-112419-NG-SJSB060-C3(0-2)	60 J	11187072-112419-NG-Dup 2	190 J	pg/g
	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	139	11187072-112419-NG-SJSB060-C3(0-2)	2.9 J	11187072-112419-NG-Dup 2	16 J	pg/g
	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	128	11187072-112419-NG-SJSB060-C3(0-2)	0.75 J	11187072-112419-NG-Dup 2	3.4 J	pg/g

Notes:

Diff - Difference (i.e., >1X RL for waters or >2XRL for soils)
RPD - Relative Percent Difference
J - Estimated concentration

Table 8

Qualified Sample Data Due to Exceedance of Calibration Range
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Analyte	Qualified Result		Units
Dioxins and Furans	11187072-091619-BN-SJSB063-S (2-4)	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	6900	J	pg/g
	11187072-091619-BN-SJSB063-S (6-8)	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	7200	J	pg/g
	11187072-091219-BN-SJSB065-S(2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3900	J	pg/g
	11187072-091219-BN-SJSB065-S(4-6)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3200	J	pg/g
	11187072-091219-BN-SJSB067-S(2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1600	J	pg/g
	11187072-091219-BN-SJSB065-S(2-4)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	10000	J	pg/g
	11187072-091219-BN-SJSB065-S(4-6)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	8200	J	pg/g
	11187072-091219-BN-SJSB067-S(2-4)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	5100	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (6-8)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	27000	J	pg/g
	11187072-100819-BN-SJSB060-S (6-8)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	150000	J	pg/g
	11187072-100819-BN-SJSB060-S (6-8)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	30000	J	pg/g
	11187072-100819-BN-SJSB060-S (8-10)	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	13000	J	pg/g
	11187072-100819-BN-SJSB066-S (2-4)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	210000	J	pg/g
	11187072-100819-BN-SJSB066-S (2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	38000	J	pg/g
	11187072-101219-BN-SJSB059-S (0-2)	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	13000	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (6-8)	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	13000	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (4-6)	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	20000	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (6-8)	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	9000	J	pg/g

Notes:

J - Estimated concentration

Table 9

Qualified Sample Results Due to Diphenyl Ether Interference
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Analyte	Qualified Result		Units
Dioxins and Furans	11187072-091619-BN-SJSB063-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	2.4	J	pg/g
	11187072-091619-BN-SJSB062-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	2.5	J	pg/g
	11187072-091619-BN-SJSB061-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.49	J	pg/g
	11187072-091619-BN-SJSB061-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	4.7	J	pg/g
	11187072-091619-BN-SJSB063-S (2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	6.0	J	pg/g
	11187072-091619-BN-SJSB063-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	2.3	J	pg/g
	11187072-091619-BN-SJSB063-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.50	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	2.7	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	5.8	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.9	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	190	J	pg/g
	11187072-100819-BN-SJSB060-S (8-10)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	69	J	pg/g
	11187072-100819-BN-SJSB060-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	3.1	J	pg/g
	11187072-100819-BN-SJSB060-S (6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1600	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.28	J	pg/g
	11187072-100819-BN-SJSB066-S (4-6)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	36	J	pg/g
	11187072-100819-BN-SJSB060-S (4-6)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.42	J	pg/g
	11187072-100819-BN-SJSB069-S (6-8)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.40	J	pg/g
	11187072-100819-BN-SJSB066-S (6-8)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.1	J	pg/g
	11187072-100819-BN-SJSB066-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	9.2	J	pg/g
	11187072-100819-BN-SJSB069-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	7.7	J	pg/g
	11187072-100819-BN-SJSB066-S (6-8)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	1.4	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (8-10)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	26	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	4.8	J	pg/g
	11187072-101219-BN-SJSB059-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	2.0	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.6	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	18	J	pg/g
	11187072-100819-BN-SJSB068-C1-S (0-2)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.39	J	pg/g

Notes:

J - Estimated concentration

Table 10

Qualified Sample Results Due to Outlying Identification Criteria
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Analyte	Qualified Result	Units
Dioxins and Furans	11187072-091619-BN-DUP2	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.16 J	pg/g
	11187072-091619-BN-DUP3	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.096 J	pg/g
	11187072-091619-BN-DUP3	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.10 J	pg/g
	11187072-091619-BN-DUP3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.22 J	pg/g
	11187072-091619-BN-DUP3	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.10 J	pg/g
	11187072-091619-BN-DUP3	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.27 J	pg/g
	11187072-091619-BN-SJSB061-S (0-2)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.75 J	pg/g
	11187072-091619-BN-SJSB061-S (0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.22 J	pg/g
	11187072-091619-BN-SJSB061-S (0-2)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.25 J	pg/g
	11187072-091619-BN-SJSB061-S (2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.39 J	pg/g
	11187072-091619-BN-SJSB061-S (2-4)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.51 J	pg/g
	11187072-091619-BN-SJSB061-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.7 J	pg/g
	11187072-091619-BN-SJSB061-S (6-8)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	24 J	pg/g
	11187072-091619-BN-SJSB061-S (8-10)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.16 J	pg/g
	11187072-091619-BN-SJSB061-S (8-10)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.35 J	pg/g
	11187072-091619-BN-SJSB061-S (8-10)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.68 J	pg/g
	11187072-091619-BN-SJSB062-S (0-2)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.54 J	pg/g
	11187072-091619-BN-SJSB062-S (2-4)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.64 J	pg/g
	11187072-091619-BN-SJSB062-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.24 J	pg/g
	11187072-091619-BN-SJSB062-S (6-8)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.64 J	pg/g
	11187072-091619-BN-SJSB062-S (6-8)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	2.1 J	pg/g
	11187072-091619-BN-SJSB062-S (8-10)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.58 J	pg/g
	11187072-091619-BN-SJSB062-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.16 J	pg/g
	11187072-091619-BN-SJSB063-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	4.0 J	pg/g
	11187072-091619-BN-SJSB063-S (0-2)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	3.0 J	pg/g
	11187072-091619-BN-SJSB063-S (4-6)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.93 J	pg/g
	11187072-091619-BN-SJSB063-S (4-6)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	1.1 J	pg/g
	11187072-091619-BN-SJSB063-S (4-6)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	1.2 J	pg/g
	11187072-091619-BN-SJSB063-S (6-8)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.0 J	pg/g
	11187072-091619-BN-SJSB063-S (6-8)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.63 J	pg/g
	11187072-091619-BN-SJSB063-S (6-8)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.73 J	pg/g
	11187072-091619-BN-SJSB063-S (8-10)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	2.9 J	pg/g
	11187072-091619-BN-SJSB063-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.50 J	pg/g
	11187072-091619-BN-SJSB063-S (8-10)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	4.3 J	pg/g
	11187072-091219-BN-DUP1	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	0.60 J	pg/g
	11187072-091219-BN-DUP1	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.51 J	pg/g
	11187072-091219-BN-SJSB065-S(0-2)	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	150 J	pg/g
	11187072-091219-BN-SJSB065-S(0-2)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	4.5 J	pg/g
	11187072-091219-BN-SJSB065-S(0-2)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	10 J	pg/g

Table 10

Qualified Sample Results Due to Outlying Identification Criteria
San Jacinto River Waste Pits Superfund Site Investigation
Predesign Investigation Sampling Event - Southern Impoundment Area
San Jacinto, Harris County, Texas
September through November 2019

Parameter	Sample ID	Analyte	Qualified Result		Units
Dioxins and Furans	11187072-091219-BN-SJSB065-S(2-4)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	7.0	J	pg/g
	11187072-091219-BN-SJSB065-S(4-6)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.3	J	pg/g
	11187072-091219-BN-SJSB067-S(0-2)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.58	J	pg/g
	11187072-091219-BN-SJSB067-S(0-2)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.70	J	pg/g
	11187072-091219-BN-SJSB067-S(0-2)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.18	J	pg/g
	11187072-091219-BN-SJSB067-S(4-6)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.39	J	pg/g
	11187072-091219-BN-SJSB067-S(6-8)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.57	J	pg/g
	11187072-091219-BN-SJSB067-S(6-8)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.34	J	pg/g
	11187072-091219-BN-SJSB067-S(8-10)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.30	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.11	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(4-6)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.35	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.25	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(4-6)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.17	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.057	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(6-8)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.23	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(6-8)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.11	J	pg/g
	11187072-091219-BN-SJSB067-CI-S(8-10)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.057	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (0-2)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	2.8	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	2.0	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (4-6)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.6	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.95	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (8-10)	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.9	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (8-10)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.091	J	pg/g
	11187072-091619-BN-SJSB061-C1-S (8-10)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.40	J	pg/g
	11187072-100819-BN-DUP4	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.46	J	pg/g
	11187072-100819-BN-DUP4	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.21	J	pg/g
	11187072-100819-BN-DUP4	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.86	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (0-2)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.54	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (0-2)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.26	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (2-4)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.24	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.13	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.3	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (6-8)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	8.8	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (8-10)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.6	J	pg/g
	11187072-100819-BN-SJSB060-C1-S (8-10)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	18	J	pg/g
	11187072-100819-BN-SJSB060-S (0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.5	J	pg/g
	11187072-100819-BN-SJSB060-S (2-4)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.74	J	pg/g
	11187072-100819-BN-SJSB060-S (2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.1	J	pg/g
	11187072-100819-BN-SJSB060-S (4-6)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.39	J	pg/g

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San Jacinto, Harris County, Texas
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Parameter	Sample ID	Analyte	Qualified Result		Units
Dioxins and Furans	11187072-100819-BN-SJSB060-S (4-6)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.48	J	pg/g
	11187072-100819-BN-SJSB060-S (4-6)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	2.1	J	pg/g
	11187072-100819-BN-SJSB060-S (4-6)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.42	J	pg/g
	11187072-100819-BN-SJSB060-S (4-6)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1.4	J	pg/g
	11187072-100819-BN-SJSB060-S (8-10)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	8.9	J	pg/g
	11187072-100819-BN-SJSB066-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.95	J	pg/g
	11187072-100819-BN-SJSB066-S (2-4)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	7.1	J	pg/g
	11187072-100819-BN-SJSB066-S (4-6)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.98	J	pg/g
	11187072-100819-BN-SJSB066-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.8	J	pg/g
	11187072-100819-BN-SJSB066-S (6-8)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	1.1	J	pg/g
	11187072-100819-BN-SJSB066-S (6-8)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	2.5	J	pg/g
	11187072-100819-BN-SJSB066-S (8-10)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.14	J	pg/g
	11187072-100819-BN-SJSB066-S (8-10)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.29	J	pg/g
	11187072-100819-BN-SJSB068-S (0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	3.5	J	pg/g
	11187072-100819-BN-SJSB068-S (2-4)	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.47	J	pg/g
	11187072-100819-BN-SJSB068-S (2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.23	J	pg/g
	11187072-100819-BN-SJSB068-S (2-4)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.16	J	pg/g
	11187072-100819-BN-SJSB068-S (4-6)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.13	J	pg/g
	11187072-100819-BN-SJSB068-S (8-10)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.19	J	pg/g
	11187072-100819-BN-SJSB068-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.20	J	pg/g
	11187072-100819-BN-SJSB068-S (8-10)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.081	J	pg/g
	11187072-100819-BN-SJSB069-S (0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.9	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.69	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.42	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.20	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.29	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.19	J	pg/g
	11187072-100819-BN-SJSB069-S (2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1.9	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.14	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.14	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.10	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.37	J	pg/g
	11187072-100819-BN-SJSB069-S (4-6)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.17	J	pg/g
	11187072-100819-BN-SJSB069-S (6-8)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.99	J	pg/g
	11187072-100819-BN-SJSB069-S (6-8)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	1.6	J	pg/g
	11187072-091219-BN-SJSB066-CI-S(0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.69	J	pg/g
	11187072-091219-BN-SJSB066-CI-S(2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.0	J	pg/g
	11187072-091219-BN-SJSB066-CI-S(2-4)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.58	J	pg/g
	11187072-091219-BN-SJSB066-CI-S(8-10)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.23	J	pg/g

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San Jacinto River Waste Pits Superfund Site Investigation
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Parameter	Sample ID	Analyte	Qualified Result	Units
Dioxins and Furans	11187072-091219-BN-SJSB066-CI-S(8-10)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.39 J	pg/g
	11187072-101219-BN-SJSB059-S (0-2)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.2 J	pg/g
	11187072-101219-BN-SJSB059-S (0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.61 J	pg/g
	11187072-101219-BN-SJSB059-S (2-4)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.27 J	pg/g
	11187072-101219-BN-SJSB059-S (2-4)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.12 J	pg/g
	11187072-101219-BN-SJSB059-S (4-6)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.81 J	pg/g
	11187072-101219-BN-SJSB059-S (4-6)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.96 J	pg/g
	11187072-101219-BN-SJSB059-S (8-10)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	1.4 J	pg/g
	11187072-101219-BN-SJSB059-S (8-10)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.34 J	pg/g
	11187072-100719-BN-DUP2A	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	1.1 J	pg/g
	11187072-100719-BN-DUP2A	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.27 J	pg/g
	11187072-100719-BN-DUP2A	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.49 J	pg/g
	11187072-100719-BN-DUP2A	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.20 J	pg/g
	11187072-100719-BN-SJSB064-S(0-2)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.46 J	pg/g
	11187072-100719-BN-SJSB064-S(0-2)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	0.93 J	pg/g
	11187072-100719-BN-SJSB064-S(2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.27 J	pg/g
	11187072-100719-BN-SJSB064-S(2-4)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.40 J	pg/g
	11187072-100719-BN-SJSB064-S(6-8)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	9.1 J	pg/g
	11187072-100719-BN-SJSB064-S(6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	4.6 J	pg/g
	11187072-100719-BN-SJSB064-S(6-8)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	3.0 J	pg/g
	11187072-100719-BN-SJSB064-S(8-10)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	3.6 J	pg/g
	11187072-100719-BN-SJSB064-S(8-10)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.27 J	pg/g
	11187072-100919-BN-SJSB065-C1-5(8-10)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.14 J	pg/g
	11187072-100919-BN-SJSB065-C1-5(8-10)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.13 J	pg/g
	11187072-100919-BN-SJSB065-C1-5(8-10)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.17 J	pg/g
	11187072-112319-SS-DUP-1	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.54 J	pg/g
	11187072-112519-SS-SJSB061-C2(0-2)	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	4.0 J	pg/g
	11187072-112519-SS-SJSB061-C2(0-2)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.21 J	pg/g
	11187072-112519-SS-SJSB061-C2(0-2)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.16 J	pg/g
	11187072-112519-SS-SJSB061-C2(0-2)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.23 J	pg/g
	11187072-112519-SS-SJSB061-C2(0-2)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.12 J	pg/g
	11187072-112519-SS-SJSB061-C2(2-4)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.25 J	pg/g
	11187072-112519-SS-SJSB061-C2(2-4)	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	0.16 J	pg/g
	11187072-112519-SS-SJSB061-C2(2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.24 J	pg/g
	11187072-112519-SS-SJSB061-C2(2-4)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.16 J	pg/g
	11187072-112619-SS-SJSB061-C2(6-8)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.31 J	pg/g
	11187072-112619-SS-SJSB061-C2(6-8)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.30 J	pg/g
	11187072-112619-SS-SJSB061-C2(8-10)	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	0.74 J	pg/g
	11187072-112619-SS-SJSB061-C2(8-10)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.37 J	pg/g

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Parameter	Sample ID	Analyte	Qualified Result	Units
Dioxins and Furans	11187072-112419-NG-Dup 1	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.51 J	pg/g
	11187072-112419-NG-Dup 2	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.72 J	pg/g
	11187072-112419-NG-SJSB060-C2(0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.68 J	pg/g
	11187072-112419-NG-SJSB060-C2(4-6)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.47 J	pg/g
	11187072-112419-NG-SJSB060-C2(6-8)	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	0.73 J	pg/g
	11187072-112419-NG-SJSB060-C3(0-2)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.34 J	pg/g
	11187072-112419-NG-SJSB060-C3(2-4)	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.54 J	pg/g
	11187072-112419-NG-SJSB060-C3(4-6)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.28 J	pg/g
	11187072-112419-NG-SJSB060-C3(4-6)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.53 J	pg/g
	11187072-112419-NG-SJSB060-C3(6-8)	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	0.096 J	pg/g
	11187072-112419-NG-SJSB060-C3(6-8)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.18 J	pg/g
	11187072-112419-NG-SJSB060-C3(8-10)	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.12 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (0-2)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.18 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (0-2)	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.45 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (0-2)	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	0.57 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (2-4)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.84 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (4-6)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	0.28 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (4-6)	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	1.6 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (4-6)	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	0.81 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (6-8)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	10 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (8-10)	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	0.56 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (8-10)	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	1.6 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (8-10)	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	0.56 J	pg/g
	11187072-100819-BN-SJSB068-C1-S (8-10)	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	0.61 J	pg/g

Notes:

J - Estimated concentration

Appendix A-6
Second Phase Pre-Design Investigation Photographic Log

Photo 1 - Drill crew collecting samples at location SJSB060-C3.

Photo 2 - Drill crew collecting samples at location SJSB062.

Second Phase Pre-Design Investigation Photographs

Photo 3 - Drill crew collecting samples at location SJGB029 using direct push technology.

Photo 4 - Drill crew collecting treatability study samples using hollow stem augers.

Second Phase Pre-Design Investigation Photographs

Photo 5 - Debris wrapped around hollow stem auger at location SJGB028.

Photo 6 - Treatability Sample from location SITS-02.

Second Phase Pre-Design Investigation Photographs

Appendix B
Treatability Study Supporting Documents

Appendix B - Index

Appendices

Appendix B-1
Treatability Soil Laboratory Reports

Appendix B-2
Treatability Water Laboratory Reports

Appendix B-3
Treatability Data Validation Report - Southern Impoundment

Memorandum

April 3, 2020

To:	Charles Munce	Ref. No.:	11187072
	DAB		
From:	Deborah Brennan/cs/4-NF	Tel:	513-285-1104
CC:	Janie Smith Stefanie Castracane		

Subject: **Analytical Results and Reduced Validation**
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

1. Introduction

This document details a reduced validation of analytical results for soil and water samples collected in support of the Treatability Investigation in support of the San Jacinto River Waste Pits Superfund Site Investigation during October, 2019. Samples were submitted to Eurofins/TestAmerica Laboratories located in Pittsburg, Pennsylvania. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Tables 2A and 2B. A summary of the analytical methodology is presented in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, duplicate data, and recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS).

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) Quality Assurance Project Plan, Final Second Phase Pre-Design Investigation", San Jacinto River Waste Pits Site, Harris County, Texas, Report No 6, June 3 2019

ii) "National Functional Guidelines for High Resolution Superfund Methods Data Review", OLEM 9200.3-115, EPA 542-B-16-001, April 2016

iii) "USEPA National Functional Guidelines for Superfund Inorganic Methods Data Review", USEPA 540-R-2016-001, September 2016

i) "USEPA National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-2016-002, September 2016

Items ii), iii), and iv) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were (prepared and) analyzed within the required holding times with the exception of one pH sample as indicated in Table 4.

All samples were properly preserved (where necessary), delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

Leachate blanks are prepared from a purified matrix, are subject to the toxicity characteristic leaching procedure and analyzed with investigative samples to determine the existence and magnitude of contamination introduced during the leaching process.

For this study, laboratory blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method and leachate blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation with the exception of those presented in Table 5.

4. Surrogate Spike Recoveries - Organic Analyses

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile organic compound (VOC), semi-volatile organic compound (SVOC), total petroleum hydrocarbon (TPH), pesticide, dioxin and furan, herbicide and polychlorinated biphenyl (PCB) determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory (method) control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries were within the laboratory control limits.

5. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference [RPD] of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

Inorganic Analyses

The LCS/LCSD contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries (and RPDs) were within the control limits, demonstrating acceptable analytical accuracy (and precision).

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, no qualification of the data was performed based on the acceptable recovery of the companion spike and the acceptable RPD.

MS/MSD analyses were performed as specified in Table 1. The laboratory performed additional site-specific MS/MSD analyses internally.

Organic Analyses

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

Inorganic Analyses

The MS/MSD samples were spiked with the analytes of interest and the results were evaluated using the "Guidelines". All percent recoveries and RPD values were within the control limits, demonstrating acceptable analytical accuracy and precision with the exception of those presented in Table 6.

7. Duplicate Sample Analyses – Inorganic Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory for inorganic analyses as specified in Table 1. The laboratory performed additional site-specific duplicate analyses internally. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were reported as estimated (J) in Tables 2A and 2B unless qualified otherwise in this memorandum.

9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Tables 2A and 2B are acceptable with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters																							Comments
						VOCs, TCLP	SVOCs, TCLP	Pesticides, TCLP	PCBs, TCLP	Herbicides, TCLP	Dioxins, Furans, TCLP	Metals, TCLP	TPH	Ignitability	Cyanide, Ttoal	Sulfide, Total	pH	Free Liquids	MOISTURE	VOCs	SVOCs	PCBs	Dioxins and Furans	Metals	Ammonia as N	COD	TDS	TOC	
180-97466-1	1187072-SITS-01	SITS-01	Soil	10/17/2019	15:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X										MS/MSD
	1187072-SITS-02	SITS-02	Soil	10/17/2019	15:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X										
	1187072-SITS-03	SITS-03	Soil	10/17/2019	15:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X										DUP
180-97782-1	11187072-S.IMPD.CONTACT INITIAL	NIMPD	Water,	10/24/2019	10:00												X			X	X	X	X	X	X	X	X	X	MS/MSD

Notes:

DUP - Laboratory Duplicate
MS/MSD - Matrix Spike/Matrix Spike Duplicate
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
PCBs - Polychorinated Biphenyls
TOC - Total Organic Carbon
TDS - Total Dissolved Solids
COD - Chemical Oxygen Demand
TCLP - Toxicity Characteristic Leaching Procedure
TPH - Total Petroleum Hydrocarbons
N - Nitrogen

Table 2A

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**
Sample Location:		**SITS-01**	**SITS-02**	**SITS-03**
Sample Identification:		**1187072-SITS-01**	**1187072-SITS-02**	**1187072-SITS-03**
Sample Date:		**10/17/2019**	**10/17/2019**	**10/17/2019**
Validation Status:		**Final**	**Final**	**Final**
Parameters	**Units**			
TCLP-Dioxins/Furans				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	7.7 U	17 J	9.5 J
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	33 U	58 U	30 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	6.0 U	5.5 J	1.8 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	3.4 U	6.6 J	5.0 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	7.6 U	5.8 J	1.7 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	3.1 U	3.2 J	1.6 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	16 U	11 U	7.4 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	3.2 U	1.9 U	1.5 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	4.6 U	4.0 J	1.3 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	2.3 U	5.6 J	1.0 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	4.2 U	3.3 J	1.2 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	5.3 U	1.4 U	1.2 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	8.3 U	1.8 U	1.7 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	2.5 U	4.9 J	1.0 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	5.6 U	1.5 U	1.2 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	3.1 U	6.8 J	5.9 J
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	3.4 U	2.0 U	1.9 U
Total heptachlorodibenzofuran (HpCDF)	pg/L	7.6 U	11 J	1.8 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	11 U	10 J	5.0 J
Total hexachlorodibenzofuran (HxCDF)	pg/L	3.2 U	14 J	1.6 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	30 J	18 J	7.4 U
Total pentachlorodibenzofuran (PeCDF)	pg/L	6.0 U	1.5 U	1.5 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	8.3 U	1.8 U	1.7 U
Total tetrachlorodibenzofuran (TCDF)	pg/L	3.1 U	11 J	9.0 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	4.4 J	2.0 U	1.9 U
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/L	0	2.96	0.661
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/L	8.81	5.77	3.42

Table 2A

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**
Sample Location:		**SITS-01**	**SITS-02**	**SITS-03**
Sample Identification:		**1187072-SITS-01**	**1187072-SITS-02**	**1187072-SITS-03**
Sample Date:		**10/17/2019**	**10/17/2019**	**10/17/2019**
Validation Status:		**Final**	**Final**	**Final**
Parameters	**Units**			
TCLP-Herbicides				
2,4,5-TP (Silvex)	mg/L	0.0030 U	0.0030 U	0.0030 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.020 U	0.020 U	0.020 U
Dinoseb	mg/L	0.038 U	0.038 U	0.038 U
TCLP-Metals				
Arsenic	mg/L	0.041 U	0.041 U	0.041 U
Barium	mg/L	0.64 J	0.35 J	1.2 J
Cadmium	mg/L	0.0028 U	0.0028 U	0.0028 U
Chromium	mg/L	0.0078 U	0.0078 U	0.0078 U
Lead	mg/L	0.029 UJ	0.029 UJ	0.029 UJ
Mercury	mg/L	0.00010 U	0.00010 U	0.00010 U
Selenium	mg/L	0.058 J	0.036 U	0.036 U
Silver	mg/L	0.0085 UJ	0.0085 UJ	0.0085 UJ
TCLP-PCBs				
Aroclor-1016 (PCB-1016)	mg/L	0.00019 U	0.00019 U	0.00019 U
Aroclor-1221 (PCB-1221)	mg/L	0.00022 U	0.00023 U	0.00022 U
Aroclor-1232 (PCB-1232)	mg/L	0.00020 U	0.00021 U	0.00020 U
Aroclor-1242 (PCB-1242)	mg/L	0.00036 U	0.00036 U	0.00036 U
Aroclor-1248 (PCB-1248)	mg/L	0.00012 U	0.00012 U	0.00012 U
Aroclor-1254 (PCB-1254)	mg/L	0.00037 U	0.00038 U	0.00037 U
Aroclor-1260 (PCB-1260)	mg/L	0.00015 U	0.00016 U	0.00015 U

Table 2A

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**
Sample Location:		**SITS-01**	**SITS-02**	**SITS-03**
Sample Identification:		**1187072-SITS-01**	**1187072-SITS-02**	**1187072-SITS-03**
Sample Date:		**10/17/2019**	**10/17/2019**	**10/17/2019**
Validation Status:		**Final**	**Final**	**Final**
Parameters	**Units**			
TCLP-Pesticides				
4,4'-DDD	mg/L	0.00021 U	0.00021 U	0.00021 U
4,4'-DDE	mg/L	0.00012 U	0.00012 U	0.00012 U
4,4'-DDT	mg/L	0.00012 U	0.00012 U	0.00012 U
Chlordane	mg/L	0.0029 U	0.0029 U	0.0029 U
Dieldrin	mg/L	0.00011 U	0.00011 U	0.00011 U
Endosulfan I	mg/L	0.00027 U	0.00027 U	0.00027 U
Endosulfan II	mg/L	0.00013 U	0.00013 U	0.00013 U
Endosulfan sulfate	mg/L	0.00026 U	0.00026 U	0.00026 U
Endrin	mg/L	0.000091 U	0.000091 U	0.000091 U
gamma-BHC (lindane)	mg/L	0.00012 U	0.00012 U	0.00012 U
Heptachlor	mg/L	0.00018 U	0.00018 U	0.00018 U
Heptachlor epoxide	mg/L	0.00014 U	0.00014 U	0.00014 U
Methoxychlor	mg/L	0.00031 U	0.00031 U	0.00031 U
Mirex	mg/L	0.000084 U	0.000084 U	0.000084 U
Toxaphene	mg/L	0.020 U	0.020 U	0.020 U
Glycols				
2-Ethoxyethanol	mg/L	2.5 U	2.5 U	2.5 U
Ethylene glycol	mg/L	1.9 U	1.9 U	1.9 U
Ethylene glycol monomethyl ether (2-methyoxyethanol)	mg/L	2.4 U	2.4 U	2.4 U
TCLP-Semi-Volatile Organic Compounds (SVOCs)				
1,4-Dichlorobenzene	mg/L	0.0045 U	0.0045 U	0.0045 U
2,4,5-Trichlorophenol	mg/L	0.0079 U	0.0079 U	0.0079 U
2,4,6-Trichlorophenol	mg/L	0.0095 U	0.0095 U	0.0095 U
2,4-Dinitrotoluene	mg/L	0.0079 U	0.0079 U	0.0079 U
2-Methylphenol	mg/L	0.0040 U	0.0040 U	0.0040 U
3&4-Methylphenol	mg/L	0.0079 U	0.0079 U	0.0079 U
Hexachlorobenzene	mg/L	0.0055 U	0.0055 U	0.0055 U
Hexachlorobutadiene	mg/L	0.0084 U	0.0084 U	0.0084 U
Hexachloroethane	mg/L	0.0040 U	0.0040 U	0.0040 U
Nitrobenzene	mg/L	0.012 U	0.012 U	0.012 U

Table 2A

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**
Sample Location:		**SITS-01**	**SITS-02**	**SITS-03**
Sample Identification:		**1187072-SITS-01**	**1187072-SITS-02**	**1187072-SITS-03**
Sample Date:		**10/17/2019**	**10/17/2019**	**10/17/2019**
Validation Status:		**Final**	**Final**	**Final**
Parameters	**Units**			
TCLP-Volatile Organic Compounds (VOCs)				
Pentachlorophenol	mg/L	0.0075 U	0.0075 U	0.0075 U
Pyridine	mg/L	0.0082 U	0.0082 U	0.0082 U
1,1,1,2-Tetrachloroethane	mg/L	0.16 U	0.16 U	0.16 U
1,1,1-Trichloroethane	mg/L	0.10 U	0.10 U	0.10 U
1,1,2,2-Tetrachloroethane	mg/L	0.12 U	0.12 U	0.12 U
1,1,2-Trichloroethane	mg/L	0.096 U	0.096 U	0.096 U
1,1-Dichloroethene	mg/L	0.11 U	0.11 U	0.11 U
1,2,3-Trichloropropane	mg/L	0.11 U	0.11 U	0.11 U
1,2-Dibromoethane (Ethylene dibromide)	mg/L	0.11 U	0.11 U	0.11 U
1,2-Dichloroethane	mg/L	0.058 U	0.058 U	0.058 U
1,3-Dichloropropene	mg/L	0.13 U	0.13 U	0.13 U
1,4-Dichlorobenzene	mg/L	0.041 U	0.041 U	0.041 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	0.12 U	0.12 U	0.12 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	0.074 U	0.074 U	0.074 U
Acetone	mg/L	0.13 U	0.13 U	0.13 U
Acetonitrile	mg/L	2.0 U	2.0 U	2.0 U
Acrylonitrile	mg/L	1.3 U	1.3 U	1.3 U
Benzene	mg/L	0.079 U	0.079 U	0.079 U
Bromodichloromethane	mg/L	0.094 U	0.094 U	0.094 U
Bromoform	mg/L	0.10 U	0.10 U	0.10 U
Bromomethane (Methyl bromide)	mg/L	0.18 U	0.18 U	0.18 U
Carbon disulfide	mg/L	0.12 U	0.12 U	0.12 U
Carbon tetrachloride	mg/L	0.13 U	0.13 U	0.13 U
Chlorobenzene	mg/L	0.063 U	0.063 U	0.063 U
Chloroform (Trichloromethane)	mg/L	0.085 U	0.085 U	0.085 U
Dichlorodifluoromethane (CFC-12)	mg/L	0.12 U	0.12 U	0.12 U
Ethylbenzene	mg/L	0.086 U	0.086 U	0.086 U
Hexachlorobutadiene	mg/L	0.073 U	0.073 U	0.073 U

Table 2A

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**	**Southern Impoundment - Treatment**
Sample Location:		**SITS-01**	**SITS-02**	**SITS-03**
Sample Identification:		**1187072-SITS-01**	**1187072-SITS-02**	**1187072-SITS-03**
Sample Date:		**10/17/2019**	**10/17/2019**	**10/17/2019**
Validation Status:		**Final**	**Final**	**Final**
Parameters	**Units**			
TCLP-Volatile Organic Compounds (VOCs)				
Isobutanol (isobutyl alcohol)	mg/L	3.6 U	3.6 U	3.6 U
Methyl acrylonitrile	mg/L	1.6 U	1.6 U	1.6 U
Methylene chloride	mg/L	0.15 U	0.15 U	0.15 U
Styrene	mg/L	0.053 U	0.053 U	0.053 U
Tetrachloroethene	mg/L	0.080 U	0.080 U	0.080 U
Toluene	mg/L	0.067 U	0.067 U	0.067 U
trans-1,3-Dichloropropene	mg/L	0.069 U	0.069 U	0.069 U
Trichloroethene	mg/L	0.060 U	0.060 U	0.060 U
Trichlorofluoromethane (CFC-11)	mg/L	0.058 U	0.058 U	0.058 U
Vinyl chloride	mg/L	0.15 U	0.15 U	0.15 U
Xylenes (total)	mg/L	0.17 U	0.17 U	0.17 U
General Chemistry				
Cyanide (total)	mg/kg	1.2	1.2	0.35 U
Free liquid	none	CNF	CNF	CNF
Ignitability	Deg F	140	140	140
Percent solids	%	61.0	61.8	74.4
pH, lab	s.u.	9.6	10	7.9
Sulfide	mg/kg	1200	850	16 J

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
TCLP - Toxicity Characteristic Leaching Procedure
CNF - Contains no free liquid
s.u. - Standard Unit

Table 2B

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Waste Pits**
Sample Location:		**SI Contact - Initial**
Sample Identification:		**11187072-S.IMPD.CONTACT INITIAL**
Sample Date:		**10/24/2019**
Validation Status:		**Final**
Parameters	**Units**	
Dioxins/Furans		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	pg/L	22000
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	pg/L	310000
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	pg/L	2800
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	43000
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	pg/L	130
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	260
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	69
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	120
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	920
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	pg/L	11 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	300
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	100
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	32 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	pg/L	38 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	pg/L	73
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	pg/L	3800
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	1000
Total heptachlorodibenzofuran (HpCDF)	pg/L	10000 J
Total heptachlorodibenzo-p-dioxin (HpCDD)	pg/L	88000 J
Total hexachlorodibenzofuran (HxCDF)	pg/L	2900 J
Total hexachlorodibenzo-p-dioxin (HxCDD)	pg/L	7400 J
Total pentachlorodibenzofuran (PeCDF)	pg/L	860 J
Total pentachlorodibenzo-p-dioxin (PeCDD)	pg/L	430 J
Total tetrachlorodibenzofuran (TCDF)	pg/L	6000 J
Total tetrachlorodibenzo-p-dioxin (TCDD)	pg/L	1200 J
Total WHO Dioxin TEQ(Human/Mammal)(ND=0)	pg/L	2170
Total WHO Dioxin TEQ(Human/Mammal)(ND=0.5)	pg/L	2170
Metals		
Aluminum	mg/L	320
Aluminum (dissolved)	mg/L	0.22
Antimony	mg/L	0.049 J
Antimony (dissolved)	mg/L	0.015 J
Arsenic	mg/L	0.16
Arsenic (dissolved)	mg/L	0.012 U
Barium	mg/L	2.8
Barium (dissolved)	mg/L	0.12
Beryllium	mg/L	0.0098
Beryllium (dissolved)	mg/L	0.00030 U
Cadmium	mg/L	0.019
Cadmium (dissolved)	mg/L	0.00050 U
Calcium	mg/L	1500
Calcium (dissolved)	mg/L	79 J

Table 2B

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Waste Pits**
Sample Location:		**SI Contact - Initial**
Sample Identification:		**11187072-S.IMPD.CONTACT INITIAL**
Sample Date:		**10/24/2019**
Validation Status:		**Final**
Parameters	**Units**	
Metals		
Chromium	mg/L	0.90 J
Chromium (dissolved)	mg/L	0.0012 U
Cobalt	mg/L	0.094
Cobalt (dissolved)	mg/L	0.0030 U
Copper	mg/L	1.2
Copper (dissolved)	mg/L	0.013
Iron	mg/L	590
Iron (dissolved)	mg/L	0.20
Lead	mg/L	3.4
Lead (dissolved)	mg/L	0.0047 J
Magnesium	mg/L	70
Magnesium (dissolved)	mg/L	24
Manganese	mg/L	9.3
Manganese (dissolved)	mg/L	0.0047 J
Mercury	mg/L	0.011
Mercury (dissolved)	mg/L	0.00010 U
Molybdenum	mg/L	0.14 J
Molybdenum (dissolved)	mg/L	0.052
Nickel	mg/L	0.27 J
Nickel (dissolved)	mg/L	0.0062
Phosphorus	mg/L	7.8
Phosphorus (dissolved)	mg/L	0.091 J
Potassium	mg/L	90
Potassium (dissolved)	mg/L	43
Selenium	mg/L	0.018 J
Selenium (dissolved)	mg/L	0.013 UJ
Silver	mg/L	0.0046 J
Silver (dissolved)	mg/L	0.00084 U
Sodium	mg/L	150
Sodium (dissolved)	mg/L	140
Strontium	mg/L	3.9
Strontium (dissolved)	mg/L	0.53
Thallium	mg/L	0.0090 UJ
Thallium (dissolved)	mg/L	0.0090 U
Vanadium	mg/L	0.51
Vanadium (dissolved)	mg/L	0.0019 U
Zinc	mg/L	9.7
Zinc (dissolved)	mg/L	0.14

Table 2B

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Waste Pits**
Sample Location:		**SI Contact - Initial**
Sample Identification:		**11187072-S.IMPD.CONTACT INITIAL**
Sample Date:		**10/24/2019**
Validation Status:		**Final**
Parameters	**Units**	
PCBs		
Aroclor-1016 (PCB-1016)	ug/L	0.19 U
Aroclor-1221 (PCB-1221)	ug/L	0.23 U
Aroclor-1232 (PCB-1232)	ug/L	0.21 U
Aroclor-1242 (PCB-1242)	ug/L	0.37 U
Aroclor-1248 (PCB-1248)	ug/L	0.12 U
Aroclor-1254 (PCB-1254)	ug/L	0.38 U
Aroclor-1260 (PCB-1260)	ug/L	0.16 U
Semi-Volatile Organic Compounds (SVOCs)		
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	0.58 U
2,4,5-Trichlorophenol	ug/L	0.61 U
2,4,6-Trichlorophenol	ug/L	0.68 U
2,4-Dichlorophenol	ug/L	0.51 U
2,4-Dimethylphenol	ug/L	0.41 U
2,4-Dinitrophenol	ug/L	15 U
2,4-Dinitrotoluene	ug/L	0.51 U
2,6-Dinitrotoluene	ug/L	0.60 U
2-Chloronaphthalene	ug/L	0.59 U
2-Chlorophenol	ug/L	0.64 U
2-Methylnaphthalene	ug/L	0.62 U
2-Methylphenol	ug/L	3.0 U
2-Nitroaniline	ug/L	5.5 U
2-Nitrophenol	ug/L	0.61 U
3&4-Methylphenol	ug/L	3.7 U
3,3'-Dichlorobenzidine	ug/L	5.8 U
3-Nitroaniline	ug/L	0.67 U
4,6-Dinitro-2-methylphenol	ug/L	15 U
4-Bromophenyl phenyl ether	ug/L	0.63 U
4-Chloro-3-methylphenol	ug/L	0.61 U
4-Chloroaniline	ug/L	0.44 U
4-Chlorophenyl phenyl ether	ug/L	0.61 U
4-Nitroaniline	ug/L	0.58 U
4-Nitrophenol	ug/L	1.4 U
Acenaphthene	ug/L	0.65 U
Acenaphthylene	ug/L	0.65 U
Acetophenone	ug/L	0.62 U
Anthracene	ug/L	0.49 U
Atrazine	ug/L	6.3 U
Benzaldehyde	ug/L	1.1 U
Benzo(a)anthracene	ug/L	0.75 U
Benzo(a)pyrene	ug/L	0.53 U
Benzo(b)fluoranthene	ug/L	0.97 U
Benzo(g,h,i)perylene	ug/L	0.69 U
Benzo(k)fluoranthene	ug/L	0.88 U
Biphenyl (1,1-Biphenyl)	ug/L	0.59 U

Table 2B

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Waste Pits**
Sample Location:		**SI Contact - Initial**
Sample Identification:		**11187072-S.IMPD.CONTACT INITIAL**
Sample Date:		**10/24/2019**
Validation Status:		**Final**
Parameters	**Units**	
Semi-Volatile Organic Compounds (SVOCs)		
bis(2-Chloroethoxy)methane	ug/L	0.67 U
bis(2-Chloroethyl)ether	ug/L	0.40 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	62 U
Butyl benzylphthalate (BBP)	ug/L	4.6 U
Caprolactam	ug/L	4.7 U
Carbazole	ug/L	0.51 U
Chrysene	ug/L	0.81 U
Dibenz(a,h)anthracene	ug/L	0.72 U
Dibenzofuran	ug/L	0.73 U
Diethyl phthalate	ug/L	5.7 U
Dimethyl phthalate	ug/L	0.56 U
Di-n-butylphthalate (DBP)	ug/L	7.4 U
Di-n-octyl phthalate (DnOP)	ug/L	6.9 U
Fluoranthene	ug/L	0.60 U
Fluorene	ug/L	0.69 U
Hexachlorobenzene	ug/L	0.56 U
Hexachlorobutadiene	ug/L	0.69 U
Hexachlorocyclopentadiene	ug/L	5.0 U
Hexachloroethane	ug/L	0.62 U
Indeno(1,2,3-cd)pyrene	ug/L	0.85 U
Isophorone	ug/L	0.54 U
Naphthalene	ug/L	0.59 U
Nitrobenzene	ug/L	5.0 U
N-Nitrosodi-n-propylamine	ug/L	0.71 U
N-Nitrosodiphenylamine	ug/L	1.2 U
Pentachlorophenol	ug/L	8.5 U
Phenanthrene	ug/L	0.55 U
Phenol	ug/L	4.9 U
Pyrene	ug/L	0.54 U
Pyridine	ug/L	5.4 U
Volatile Organic Compounds (VOCs)		
1,1,1-Trichloroethane	ug/L	2.5 U
1,1,2-Trichloroethane	ug/L	2.4 U
1,1-Dichloroethane	ug/L	1.8 U
1,1-Dichloroethene	ug/L	2.9 U
1,2,4-Trichlorobenzene	ug/L	3.7 U
1,2-Dichlorobenzene	ug/L	2.0 U
1,2-Dichloroethane	ug/L	1.5 U
1,2-Dichloropropane	ug/L	2.5 U
1,3-Dichlorobenzene	ug/L	1.6 U
1,4-Dichlorobenzene	ug/L	1.0 U

Table 2B

Analytical Results Summary
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation-Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Area		**Southern Impoundment - Waste Pits**
Sample Location:		**SI Contact - Initial**
Sample Identification:		**11187072-S.IMPD.CONTACT INITIAL**
Sample Date:		**10/24/2019**
Validation Status:		**Final**
Parameters	**Units**	
Volatile Organic Compounds (VOCs)		
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	2.9 U
Benzene	ug/L	2.0 U
Bromodichloromethane	ug/L	2.4 U
Bromoform	ug/L	2.6 U
Carbon tetrachloride	ug/L	3.3 U
Chlorobenzene	ug/L	1.6 U
Chloroethane	ug/L	2.6 U
Chloroform (Trichloromethane)	ug/L	2.1 U
cis-1,2-Dichloroethene	ug/L	1.6 U
cis-1,3-Dichloropropene	ug/L	1.6 U
Ethylbenzene	ug/L	2.2 U
m&p-Xylenes	ug/L	1.9 U
o-Xylene	ug/L	2.4 U
Tetrachloroethene	ug/L	2.0 U
Toluene	ug/L	1.7 U
trans-1,2-Dichloroethene	ug/L	2.5 U
trans-1,3-Dichloropropene	ug/L	1.7 U
Trichloroethene	ug/L	1.5 U
Vinyl chloride	ug/L	3.7 U
Xylenes (total)	ug/L	4.3 U
General Chemistry		
Ammonia-N	mg/L	2.6
Chemical oxygen demand (COD)	mg/L	93
pH, lab	s.u.	7.7 J
TOC average duplicates	mg/L	36
Total dissolved solids (TDS)	mg/L	50 U

Notes:
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
s.u. - Standard Unit

Table 3

Analytical Methods
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Parameter		Method	Matrix	Holding Time: Collection to Extraction (Days)	Holding Time: Collection or Extraction to Analysis (Days)
Volatile Organic Compounds (VOCs)		SW-846 8260B	Water	--	14
Volatile Organic Compounds, TCLP		SW-846 8260R	Soil	14	14
Semivolatile Organic Compounds		SW-846 8270	Water	7	40
Semivolatile Organic Compounds, TCLP		SW-846 8270R	Soil	14	40
Polychlorinated Biphenyls (PCBs)		SW-846 8082	Water	7	40
Pesticides, TCLP		SW-846 8081R	Soil	14	40
PCBs, TCLP		SW-846 8082R	Soil	14	40
Herbicides, TCLP		SW-846 8151R	Soil	14	40
Dioxins, Furans, TCLP		EPA 1613R	Soil	14	40
Polychlorinated Dibenzodioxins (PCDDs) & Polychlorinated Dibenzofurans (PCDFs)		EPA 1613	Water	14	40
Metals		SW-846 6010C	Water	--	180
		SW-846 7470	Water	--	28
Metals, TCLP		SW-846 6010R	Soil	180	180
		SW-846 7470R	Soil	28	28
Gasoline Range Organics (GRO)/		SW-846 8015B	Soil	--	14
Diesel Range Organics (DRO)/Motor Oil Range Organics (ORO)		SW-846 8015B	Soil	14	40
General Chemistry	- Ammonia	EPA 350.1	Water	--	28
	- Moisture	MOISTURE	Soil	--	--
	- TDS	SM 2540C	Water	--	7
	- Ignitability	SW-846 1020	Soil	--	14

Table 3

Analytical Methods
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

			Holding Time	
Parameter	**Method**	**Matrix**	**Collection to Extraction (Days)**	**Collection or Extraction to Analysis (Days)**
- Cyanide	SW-846 9014	Soil	--	28
- Sulfide	SW-846 9034	Soil	--	7
- pH	SW-846 9040	Water	--	Immediately
- pH	SW-846 9045	Soil	--	Immediately after Leaching
- Free Liquids	SW-846 9095	Soil	--	--
Total Organic Carbon (DOC)	SM 5310 C	Water	--	28
Chemical Oxygen Demand (COD)	EPA 410.4	Water	--	28

Notes:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
EPA - "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983 (with all subsequent revisions).
SM - "Standard Methods for the Examination of Water and Wastewater", 20th Edition, 1998(with all subsequent revisions).
TDS - Total Dissolved Solids
TCLP - Toxicity Characteristic Leaching Procedure
\- - Not Applicable

Table 4

Qualified Sample Results Due to Holding Time Exceedance
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Parameter	Sample ID	Holding Time (days)	Holding Time Criteria (days)	Analyte	Qualified Sample Results	Units
General Chemistry	11187072-S.IMPD.CONTACT INITIAL	15 days	Immediately	pH, lab	7.7 J	s.u.

Notes:

J - Estimated concentration
s.u. - Standard Units

Table 5

Qualified Sample Results Due to Analyte Concentrations in the Method/Leaching Blanks
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Sample Delivery Group	Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
180-97466-1	Dioxins, Furans, TCLP	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	10/29/2019	4.92 J	1187072-SITS-01	33 J	33 U	pg/L
					1187072-SITS-02	58 J	58 U	pg/L
					1187072-SITS-03	30 J	30 U	pg/L
180-97466-1	Dioxins, Furans, TCLP	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	10/31/2019	13.2 J	1187072-SITS-01	16 J	16 U	pg/L
					1187072-SITS-02	11 J	11 U	pg/L
					1187072-SITS-03	7.4 J	7.4 U	pg/L
180-97466-1	Dioxins, Furans, TCLP	Total hexachlorodibenzo-p-dioxin (HxCDD)	10/31/2019	13.2 J	1187072-SITS-03	7.4 J	7.4 U	pg/L

Notes:

*	- Blank result adjusted for sample factors where applicable
U	- Not detected at the associated reporting limit
J	- Estimated concentration

Table 6

Qualified Sample Results Due to Outlying MS/MSD Results
San Jacinto River Waste Pits Superfund Site Investigation
Treatability Investigation - Southern Impoundment Area
San Jacinto, Harris County, Texas
October 2019

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Qualified Result	Units
Metals, TCLP	1187072-SITS-01	Barium	38	53	32	75 - 125	20	0.64 J	mg/L
	1187072-SITS-02							0.35 J	mg/L
	1187072-SITS-03							1.2 J	mg/L
Metals, TCLP	1187072-SITS-01	Lead	53	66	21	75 - 125	20	0.029 UJ	mg/L
	1187072-SITS-02							0.029 UJ	mg/L
	1187072-SITS-03							0.029 UJ	mg/L
Metals, TCLP	1187072-SITS-01	Silver	34	48	32	75 - 125	20	0.0085 UJ	mg/L
	1187072-SITS-02							0.0085 UJ	mg/L
	1187072-SITS-03							0.0085 UJ	mg/L

Notes:

MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
TCLP - Toxicity Characteristic Leaching Procedure

Appendix C
Supplementary Deliverables

Appendix C - Index

Attachments

Attachment 1
Health and Safety Plan

Attachment 1 - Health and Safety Plan - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11187072 **|** Report No 12

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Table Index

Attachment Index

1. Introduction

This Health and Safety Plan (HASP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). References in this HASP to the "work site" are to the Southern Impoundment and references to "Implementing Party" are to the entity(ies) implementing the remedial action (RA) for the Southern Impoundment.

This HASP was developed to outline potential activities to be performed to protect work site personnel and area residents from physical, chemical, and all other hazards posed by the RA for the Southern Impoundment. As specified in the SOW, this HASP was prepared in accordance with the EPA Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 Code of Federal Regulations (CFR) 1910 and 1926.

1.1 Purpose

The purpose of this work site-specific HASP is to provide specific guidelines and establish procedures for the protection of personnel performing the activities described in Section 2. The HASP is a living document, in that it must continually evolve as work site conditions and knowledge of work activities develop.

The HASP, as applicable to this project, includes the following measures:

- Communicate the contents of this HASP to work site personnel.
- Eliminate unsafe conditions. Efforts must be initiated to identify conditions that can contribute to an incident and to remove exposure to these conditions.
- Utilize the STAR (Stop, Think, Act, and Review) process before beginning any activity/task/job, after an incident, and/or during any unusual circumstances. Stop the activities to think about the task, analyze the task hazards and determine methods to reduce risk, and review the results with affected personnel.
- Revise or develop Job Safety Analysis (JSA) forms for activities. Supervisors and affected personnel are responsible for JSA development. A blank JSA form has been included in Attachment 2 of this HASP.
- Complete behavioral-based safety (BBS) observations via the use of the Safe Task Evaluation Process (STEP).
- Reduce unsafe acts by using the BBS tools (STEPs, JSAs, STAR, etc.). Personnel shall make a conscious effort to work safely. A high degree of safety awareness must be maintained so that safety factors become an integral part of the task. Supervisory personnel shall ensure that personnel committing unsafe acts are held accountable via counseling, mentoring, and, if necessary, reprimand.
- Inspect frequently. Regular documented safety inspections of the work area, materials, and equipment by qualified persons ensure early detection of unsafe conditions. HSE deficiencies

shall be corrected as soon as possible or project activities shall be suspended. Documentation of daily inspections and corrective actions should be kept with the project files.

1.2 Stop Work Authority

All employees are empowered and expected to stop the work of co-workers, subcontractors, Implementing Party employees, or other contractors if any person's safety or the environment are at risk. No repercussions will result from this action. Reporting of unsafe condition/acts and/or Stop Work Authority (SWA) shall be documented using the Unsafe Condition/Acts and SWA form located in Attachment 1.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the removal of work site personnel from that area and re-evaluation of the hazard and the levels of protection.

1.3 Personnel Requirements

All personnel conducting activities at the work site must conduct their activities in compliance with all applicable HSE legislation at both state and federal levels to include, but not limited to, the Texas Administrative Code (TAC), OSHA 29 CFR 1910, 29 CFR 1926, and associated policies and procedures. **Project personnel must also be familiar with the procedures and requirements of this HASP**. In the event of conflicting safety procedures/requirements, personnel must implement those safety practices affording the highest level of safety and protection.

1.4 Short Service Employees

Employees and subcontractors identified as Short Service Employees (SSE) (6 months or less) shall not be permitted to work without another non-SSE employee present.

1.5 Project Management and Safety Responsibilities

Project Manager

The Project Manager (PM) shall be responsible for the overall implementation of the HASP, and for ensuring that all HSE responsibilities are carried out in conjunction with this project. This shall include, but is not limited to, review and approval of the HASP, ensuring that STEP forms are completed properly, qualifying and directing subcontractors relative to HSE performance, coordinating all HSE submittals, and consultation with the SS regarding appropriate changes to the HASP. The PM will also ensure that the appropriate resources are provided to support the project with respect to all operations.

Site Supervisor

The Site Supervisor (SS) is the person who, under the supervision of the PM, shall be responsible for the communication of work site requirements to work site project personnel and subcontractors, and is responsible for carrying out the HSE responsibilities by ensuring:

1. Conduct a daily Tailgate Safety meeting that communicates the work site-specific hazards for the operations that day and what proactive measure will minimize the hazards. Each meeting must be documented on the Tailgate Safety Meeting Form to include all topics covered and the signatures of those in attendance.
2. All necessary clean-up and maintenance of safety equipment is conducted by project personnel.
3. Emergency phone numbers and services, including hospital and clinic locations, are verified.
4. Site personnel are implementing the STAR process before initiating activities.
5. JSA forms are developed and revised accordingly.
6. Forms attached to the HASP are completed, filed, and submitted correctly, including daily tailgate meetings and completion of daily inspection checklists.
7. A pre-entry briefing is conducted and documented, and serves to familiarize on-site personnel with the procedures, requirements, and provisions of the HASP.

Other duties include overall implementation of the HASP and ensuring that all HSE responsibilities are carried out in conjunction with the project. This shall include, but is not limited to, review and approval of the HASP, communication of work site requirements to subcontractor personnel, and consultation with the Implementing Party/work site representative regarding appropriate changes to the HASP.

The SS is also responsible for enforcing safe work practices for project employees. The SS watches for ill effects on any crew member, especially those symptoms caused by cold/heat stress or chemical exposure. The SS oversees the safety of visitors who enter the work site. The SS maintains communication with the Implementing Party/work site representative(s).

Other specific duties of the SS include:

- Ordering the immediate shutdown and/or stop work of activities in the case of a medical emergency, unsafe condition, or unsafe practice
- Providing the safety equipment, personal protective equipment (PPE), and other items necessary for employees
- Enforcing the use of required safety equipment, PPE, and other items necessary for employee or community safety
- Conducting work site inspections as a part of quality assurance for HSE
- Reporting HSE concerns to work site and/or project management, as necessary

Regional Safety & Health Manager

The Regional Safety & Health Manager (RSHM) is a full-time employee who is trained as a HSE professional, and serves in a consulting role to the PM and SS regarding potential HSE issues.

Employee Safety Responsibility

Employees are responsible for their own safety as well as the safety of those around them. Employees and subcontractors shall use any equipment provided in a safe and responsible manner, as directed by their supervisor.

Employees are directed to take the following actions when appropriate:

- Suspend any operations that may cause an imminent health hazard to employees, subcontractors, or others.
- Utilize the STAR process before initiating work.
- Assist in the development and revision of JSA forms that are appropriate to their current scope of work.
- Prepare, submit, and review behavior-based safety observations using the STEP form. The STEP form is to be used in conjunction with the appropriate JSA to identify positive aspects of task performance as well as to identify any deficiencies associated with the observed task.
- Inspect tools and other equipment before each use or as manufacturer and/or OSHA dictates.
- Correct work site hazards when possible without endangering life or health.
- Report HSE concerns to the SS, PM, or RSHM.

Subcontractors - Subcontractors are responsible for the implementation of their own HASP and agree to comply with its contents. In the event of conflicting safety procedures or requirements, personnel must implement those safety practices that afford the highest level of safety and protection. In addition, non-compliance with HSE policies and procedures may subject the subcontractor to disciplinary action up to and including termination of their contract. Subcontractors will be required to attend an initial work site orientation and subsequent safety meetings.

Equipment Operators - All equipment operators are responsible for the safe operation of heavy equipment. Operators are responsible for inspecting their equipment on a daily basis to ensure safe performance. Brakes, hydraulic lines, backup alarms, and fire extinguishers must be inspected routinely throughout the project. Equipment will be taken out of service if an unsafe condition occurs. Documentation of daily inspections is required.

Authorized Visitors - Authorized visitors shall be provided with all known information with respect to Site operations and hazards as applicable to the purpose of their visit and should be accompanied with personnel familiar with the work site’s layout and procedures.

1.6 Site HASP Amendments

Any change to the scope of work must be evaluated for its impact on the overall health and safety of the project and associated personnel. A minor change is one that adjusts already documented hazards within the HASP and does not expose work site personnel to chemicals above exposure limits, such as the introduction of a new JSA, Journey Management Plan, or PPE that does not involve a change in respiratory protection. Amendments must be documented on the work site HASP Amendment Form located in Attachment 1, in addition to notifications to key personnel.

Significant changes to the scope of work require a rewrite and review/approval of the HASP.

1.7 Training Requirements

All personnel conducting work at the work site shall have completed the appropriate HSE training as applicable to their job tasks/duties. The required training is referenced throughout the HASP and identified on each JSA form.

1.7.1 Site-Specific Training

An initial work site-specific training session or briefing shall be conducted by the PM or SS prior to commencement of work activities. During this initial training session, employees shall be instructed on the following topics:

- Personnel responsibilities
- Content and implementation of the HASP
- Work site hazards and controls
- Work site-specific hazardous procedures
- Training requirements
- PPE requirements
- Emergency information, including local emergency response team phone numbers, route to nearest hospital, incident reporting procedures, and emergency response procedures
- Instruction in the completion of required inspections and forms
- Location of safety equipment, such as portable eyewash, first aid kit, fire extinguishers, etc.

The various components of the project HASP will be presented, followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel will not be permitted to enter or work in potentially contaminated areas of the work site until they have completed the work site-specific training session. Personnel successfully completing the training session shall sign the HASP Training Acknowledgement Form, which is presented in Attachment 1.

In addition to the initial work site briefing conducted at the commencement of the project, supplemental brief safety meetings shall be conducted by the SS to discuss potential HSE hazards associated with upcoming tasks and necessary precautions to be taken.

1.7.2 Safety Meeting/HASP Review

"Tailgate" safety meetings will take place each day prior to beginning the day's work. All work site personnel will attend these safety meetings conducted by the SS. The safety meetings will cover specific HSE issues, including the appropriate JSAs, work site activities, changes in work site conditions, and a review of topics covered in the work site-specific pre-entry briefing. The safety meetings will be documented each day with written sign-in sheets containing a list of topics discussed. To assist with the compliance of documentation of the Tailgate safety meetings, there are two formats available. For meetings attended by more than four people, please use the Tailgate

Safety Meeting Form-Large Group daily format, which requires one page for each Tailgate safety meeting conducted. If there are four or fewer people, please use the Tailgate Safety Meeting Form-Small Group multiple-day format, which provides room to document three Tailgate safety meetings on one page. The two Tailgate Safety Meeting Forms (Large Group and Small Group) are located in Attachment 1.

2. Site Operations

2.1 Scope of Work

This HASP covers the specific work site activities that will be conducted by personnel and their subcontractors. These activities are as follows:

- Mobilization of personnel, materials, and equipment to and from the work site
- Site reconnaissance activities
- Over-water activities
- Heavy equipment spotting
- Surveying activities
- Equipment fueling
- Soil sampling using Direct Push Technology and/or rotosonic drilling
- Lifting and rigging activities
- Decontamination of personnel and equipment
- Boat and barge operation
- Driving

If work site operations are altered or if additional tasks are assigned, an addendum to this HASP shall be developed to address the specific hazards associated with these changes.

3. Hazard Evaluation

This section identifies and evaluates the potential chemical, physical, and biological hazards that may be encountered during the completion of this project. These hazards and the anticipated initial exposure levels are based on Implementing Party data, historical data, etc.

Specific activity JSA forms (located in Attachment 2) have been developed to address the hazards associated with the work site operations outlined in Section 2. New JSAs will be developed on an as-necessary basis if a JSA for that specific task is not available in the HASP. Additionally, current JSAs will be modified and customized in the field to ensure that the task-specific requirements are addressed each time the task is performed.

3.1 Chemical Hazards

The chemical hazards associated with conducting work site operations include the potential exposure to on-site contaminants encountered during field activities such as soil sampling, sediment sampling, groundwater sampling, products used in decontamination of equipment, and support products such as fuel. The potential routes of exposure from these products during normal use may occur through inhalation of vapors and dusts, or direct contact or absorption with the materials. The chemical hazards of concern that may be encountered during the tasks identified in the project's scope of work are listed in Table 1, which include: dioxins, furans, and PCBs**.** A listing of the contaminants of concern is found in Table 1, which includes exposure limits, signs and symptoms of exposure, chemical properties, and physical characteristics.

3.1.1 Chemical Hazard Controls

Exposure to potential on-site contaminants/chemicals shall be controlled by:

- Monitoring air concentrations with appropriate equipment in the breathing zone
- Revising JSAs to list chemical hazards and associated hazard controls on a task-specific basis
- Employing dust control measures such as wetting the immediate area
- Using PPE/respiratory protection, as appropriate, in areas known to have concentrations above the specified action level for each contaminant

3.1.2 Skin Contact and Absorption Contaminants

Skin contact with chemicals may be controlled by use of the proper PPE and good housekeeping procedures. The proper PPE (e.g., Tyvek®, gloves) as described in Section 4 shall be worn for all activities where contact with potentially harmful media or materials is anticipated. Utilize manufacturer data on permeation and degradation to minimize skin contact potential (see Section 4.2.1 for additional information).

3.1.3 Hazard Communication/WHMIS

Personnel required to handle or use hazardous materials as part of their job duties will be trained and educated in accordance with the Workplace Hazardous Materials Information System (WHMIS) standard as applicable. The training shall include instruction on the safe use and handling procedures of hazardous materials, how to read and access SDSs, and the proper labeling requirements.

3.1.4 Flammable and Combustible Liquids

The storage, dispensing, and handling of flammable and combustible liquids must be in accordance with industry standards such as National Fire Protection Agency (NFPA) guidelines. The specific flammable or combustible liquids used at the work site may include gasoline, diesel, kerosene, oils, and solvents.

Flammable and combustible liquids are classified according to flash point. This is the temperature at which the liquid gives off sufficient vapors to readily ignite. Flammable liquids have flash points below 100°F (37.8°C). Combustible liquids have flash points above 100°F (37.8°C) and below 200°F (93.3°C).

Storage

Many flammables can ignite at temperatures at or below room temperature. They are far more dangerous than combustibles when they are heated. As a result, these products must be handled very carefully. At normal temperatures, these liquids can release vapors that are explosive and hazardous to employee health. Exposure to heat can cause some of these liquids to break down into acids, corrosives, or toxic gases. For this reason, flammable and combustible liquids should be stored in cool, well-ventilated areas away from any source of ignition. Always consult the SDS of the product for specific information.

Flammable and combustible liquids must be stored in designated areas. Such areas must be isolated from equipment and work activity that may produce flames, sparks, heat, or any form of ignition, including smoking. The most practical method is the use of one or more approved (commercially available) flammable/combustible liquid storage cabinets.

Cabinets must be labeled “Flammable - Keep Fire Away.” Doors must be kept closed and labeled accordingly. Containers must be kept in the cabinet when not in use.

General Requirements

- Keep containers of flammable/combustible liquids closed when not in use.
- Keep flammable/combustible liquids in designated areas and approved cabinets.
- Do not allow use of unapproved containers for transfer or storage. Use only approved safety cans (5-gallon maximum) with a spring closing lid and spout cover, designated to safely relieve internal pressure when exposed to heat or fire.
- Use only approved self-closing spigots, faucets, and manual pumps when drawing flammable/combustible liquids from larger containers/barrels.
- Use only approved metal waste cans with lids for disposal of shop towels/oily rags.
- Designate “Smoking” and “No Smoking” areas.
- Designate fueling areas.
- Observe all signs indicating “No Smoking,” “No Flames,” and “No Ignition.”

Transferring Flammable/Combustible Liquids

- This seemingly routine task can be hazardous if certain precautions are not followed. Grounding and bonding must be observed at all times to prevent the accumulation of static electricity when transferring containers/barrels one to another.
- Drums should be grounded to a grounding rod using a #4 copper conductor.
- Bonding is necessary between conductive containers (e.g., a barrel and a 5-gallon container).

3.2 Physical Hazards

Physical hazards that may be present during project work include: potential for close proximity to heavy equipment, noise, overhead or underground utilities, vehicle traffic, material handling, heavy lifting, electrical or stored energy, excavations, use of hand and power tools, use of all-terrain vehicles, use of utility task vehicles, slip/trip/hit/fall injuries, heat/cold stress, working on or near water, boating, working at night or with illumination difficulties, biological hazards, other potential adverse weather conditions, working alone, and aggressive or menacing behavior. In addition, personnel must be aware that the protective equipment worn may limit dexterity and visibility and may increase the difficulty of performing some tasks.

3.2.1 Heavy Equipment Safety

Heavy Equipment

The following practices shall be adhered to by personnel operating heavy equipment (such as backhoes) and personnel working in the vicinity of heavy equipment:

- Heavy equipment is to be inspected when equipment is initially mobilized, delivered to the work site, or after it is repaired and returned to service, to ensure that it meets all manufacturer and OSHA specifications (e.g., fire extinguishers, backup alarms, etc.). Documentation of these inspections are to be filed with the project files.
- Heavy equipment is to be inspected on a daily basis. Documentation of this daily pre-operational inspection is to be filed with the project files.
- Heavy equipment is only to be operated by authorized, competent operators.
- Seat belts are to be provided on heavy equipment that is not designed for stand-up operation.
- Equipment/vehicles whose payload is loaded by crane, excavator, loader, etc. will have a cab shield and/or canopy to protect the operator.
- Personnel will not be raised/lowered in buckets.
- Personnel will not ride on fender steps or any place outside the cab.
- Before leaving the equipment controls, ensure that the equipment is in its safe resting position. For a backhoe, apply the parking brake, put the front loader bucket down on the ground level, and ensure that the rear excavator bucket is locked in the travel position. Bulldozers and scraper blades, loader buckets, dump bodies, and similar equipment will be fully lowered or blocked when not in use.
- Before raising any booms, buckets, etc., check for overhead obstructions.
- Employees involved in the operation shall not wear any loose-fitting clothing, as it has the potential to be caught in moving machinery.
- Personnel shall wear high visibility safety vests, steel-toed shoes, safety glasses, hearing protection, and hard hats during heavy equipment operations.
- When moving heavy equipment or when working within 10 feet of a stationary object or in tight quarters, a spotter will be used.

3.2.2 Noise

Project activities that include working in close proximity to heavy equipment and/or drilling operations, or using power tools that generate noise levels exceeding the decibel range of 85 dBA, will require the use of hearing protection with a Noise Reduction Rating (NRR) of at least 20. Hearing protection (earplugs/muffs) will be available to personnel and visitors requiring entry into these areas.

When it is difficult to hear a coworker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All work site personnel who may be exposed to high noise levels will participate in a Hearing Conservation Program.

3.2.3 Utility Clearances

Elevated superstructures (e.g., drill rigs, backhoes, scaffolding, ladders, cranes) shall remain a distance of 10 feet away from utility lines (<50 kV) and 20 feet away from power lines (>50 kV). Underground utilities, if present, shall be clearly marked and identified prior to commencement of work. Local/state/provincial regulations and Implement Party requirements with regards to utility locating requirements (e.g., One-Call) shall be followed.

Personnel involved in intrusive work shall:

- Confirm proposed intrusive work and heavy truck routes are not in the area of subsurface utilities. This meeting is to be documented.
- Review and adhere to Subsurface Utility Clearance Protocol. Use prudent digging techniques inside 18 inches of the outside edge of an underground facility. This distance will vary based on state law, facility/Implementing Party requirements, etc. Refer to the *Texas Utilities Code, Title 5, Chapter 251*, *and TAC Title 16, Chapter 18* for additional guidance.
- **Utilize the Underground Utilities Checklist included in Attachment 1. This is to be completed prior to initiating excavation activities.**
- Be able to determine the minimum distance from marked utilities, identify the work that can be conducted with the assistance of the locator line service, coordinate document/drawing review, and inspect the work site for manholes, catch basins, valve boxes, etc. that may indicate the direction/depth of underground installations. Marking indicates only the approximate location of buried lines. After obtaining the facility owner's permission, hand dig test holes (or use an equivalent means) in a careful and prudent manner to determine the precise location of underground facility lines. If the location of the lines is still undeterminable after hand digging/probing/soft digging, call the facility owner for additional direction and assistance prior to initiating intrusive operations.
- If you must expose a line, state law requires contractors to protect and support the underground facility line while working at the work site.

3.2.4 Vehicle Traffic and Control

The following safety measures are to be taken by personnel that have the potential to be exposed to vehicle traffic:

- A high visibility safety vest meeting American National Standards Institute (ANSI) Class II garment requirements is to be worn at all times.
- Employees will work using the "buddy system".
- Cones and other visible markers will be used to demarcate a safe work zone around the active work zone(s).
- Appropriate signage will be posted as necessary, to inform roadway/parking lot users of any additional control measures necessary.

The motor vehicle safety program includes the following critical components that must be followed at all times:

- Driving restrictions around electronic device usage
- Defensive driving training requirements
- Operating standards
- Driver qualifications
- Proper vehicle selection
- Vehicle inspection/maintenance

Drivers are to make a 360-degree (360°) walk around of the vehicle immediately before placing vehicle into motion to determine if there are any hazards or possible obstructions in the proposed path of travel. Drivers are to clear the area of people and objects before placing the vehicle in motion. A check will also be performed to ensure overhead and side clearances are adequate.

The journey planning process is a simple risk assessment to ensure that all identified hazards are understood and managed and that unnecessary trips or those presenting an unreasonable or uncertain risk are not taken. Journey Management Plans (JMPs) will be developed for routine travel and work site access. JMP documentation and forms are provided in Attachment 4.

Additionally, **when working on an active roadway or along the shoulder or side of the road is necessary**, project personnel must follow the requirements presented in the Manual on Uniform Traffic Control Devices (MUTCD), which is found at: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm. This will include the implementation of a Temporary Traffic Control Plan (TTCP) and discussion with the local municipality as to the responsible party who will implement the TTCP. A TTCP has four components: the Advanced Warning Area, the Transition Area, the Activity Area, and the Termination Area.

3.2.5 Material Handling and Storage

Material handling and storage practices to be conducted at the work site include manual lifting of materials and possibly the use of hoisting and rigging equipment. As a rule, use mechanical means for lifting heavy loads whenever possible.

General Storage Practices

The basic safety requirement for storage areas is that the storage of materials and supplies shall not create a hazard. Additional general storage area practices include the following:

- Bags, containers, bundles, etc. stored in tiers shall be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.
- All stacked materials, cargo, etc. shall be examined for sharp edges, protrusions, signs of damage, or other factors likely to cause injury to persons handling these objects. Defects should be corrected as they are detected.
- Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage.
- Storage areas shall have provisions to minimize manual lifting and carrying. Aisles and passageways shall provide for the movement of mechanical lifting and conveyance devices.
- Stored materials shall not block or obstruct access to emergency exits, fire extinguishers, alarm boxes, first aid equipment, lights, electrical control panels, or other control boxes.
- “NO SMOKING” signs shall be conspicuously posted, as needed, in areas where combustible or flammable materials are stored and handled.

Cylindrical materials such as pipes and poles shall be stored in racks or stacked on the ground and blocked.

Special Precautions for Hazardous or Incompatible Materials Storage

Generally, materials are considered hazardous if they are ignitable, corrosive, reactive, or toxic. Manufacturers and suppliers of these materials must provide the recipient with SDSs, which describe their hazardous characteristics and give instructions for their safe handling and storage.

Many hazardous materials are incompatible, which means they form mixtures that may have hazardous characteristics not described on the individual SDSs. The following special precautions shall be followed regarding the storage of hazardous materials:

- Based on the information available on the SDSs, incompatible materials shall be kept in separate storage areas
- Warning signs shall be conspicuously posted, as needed, in areas where hazardous materials are stored

3.2.6 Working Over or Near Water

The procedures outlined in this section are to be implemented by all personnel when there is the potential for slipping or falling into water that is greater than 3 feet in depth. Additionally, these procedures are to be adhered to when water is flowing and has the potential to carry personnel away.

- When working at ground level, a 5-foot “no entry zone” can be established between the work area and the water hazard. The no entry zone is to be clearly defined and/or demarcated.

Personnel will not be permitted to enter into this area unless the other provisions of this section are in place.

- Standard guardrails are required on any walking/working surface over or near water.
- Where guardrails are not practical due to impairment of work being performed, other types of safeguarding, such as safety harnesses, lifelines, and lanyards may be used (see Fall Protection Standard Operating Procedure [SOP]).
- If providing fall protection is not feasible due to the scope of work or location, personnel will be required to wear U.S. Coast Guard-approved life jackets or buoyant work vests. Prior to each use and after each use, the buoyant work vests and life preservers must be inspected for defects that would affect strength and/or buoyancy. Any damaged or defective buoyant work vest or life preserver cannot be used.
- Call in or make prearranged contacts after each activity posing a drowning hazard is completed.
- If work on wet or slippery surfaces above water is necessary, non-slip tape or other methods are to be used to increase traction.
- Ring buoys with a minimum 90 feet of line must be readily available for emergency operations. The distance between buoys cannot exceed 200 feet.
- Due to the anticipated scope of work, a lifesaving skiff may be necessary. However, the SS in conjunction with the RSHM will evaluate current work site conditions to determine if a skiff is required.

3.2.7 Boating Safety

Boating Safety

Safety precautions must be taken when project activities include working in or from a boat. It is a Texas requirement for operators of small boats or vessels to complete the Texas Parks and Wildlife Division (TPWD) Boater Education Course. This course can be taken online, and must be completed prior to operating a boat or vessel over 15 horsepower.

The following summarizes key guidelines for the safe operation of boats:

1. An approved Type I, II, III, or V personal flotation device (PFD) must be available onboard for each person on the boat. A PFD shall be worn when working in the smaller boats used for collecting samples from bodies of water.
2. Vessels longer than 16 feet in length shall also have an approved Type IV throwable ring buoy or buoyant cushion onboard.
3. No vessel shall be operated in a reckless or negligent manner. Examples of reckless or negligent operation include:
    - Excessive speed in regulated or congested areas
    - Operating in a manner that may cause an accident
    - Operating in a swimming area with bathers present

- Operating while under the influence of alcohol
- Operation of a personal watercraft that endangers life or property

4. Every vessel shall display the lights and shapes required by the navigation rules.
5. Accidents should be reported immediately to a law enforcement agency.
6. It is a good idea for all vessels with a motor to have an approved, fully charged fire extinguisher onboard.

Operator's Responsibilities

1. Make sure the boat is in top operating condition and that there are no tripping hazards. The boat should be free of fire hazards and have clean bilges.
2. Ensure that safety equipment required by law is on board, equipment is maintained in good condition, and you know how to properly use these devices.
3. File a float plan with a co-worker who is ashore.
4. Have a complete knowledge of the operation and handling characteristics of your boat.
5. Know your position and know where you are going.
6. Maintain a safe speed at all times to avoid collision.
7. Keep an eye out for changing weather conditions and act accordingly.
8. Know and practice Navigational Rules.
9. Know and obey federal and state regulations and waterway markers.
10. Maintain a clear, unobstructed view forward at all times. Scan the water back and forth; avoid tunnel vision. Most boating collisions are caused by inattention.

Overloading

Never overload your boat with passengers and cargo beyond its safe carrying capacity. Too many people and/or gear will cause the boat to become unstable. Always balance the load so that the boat maintains proper trim. Here are some things to remember when loading your boat:

1. Distribute the load evenly fore and aft from side to side.
2. Keep the load low.
3. Keep passengers seated (do not stand up in a small boat).
4. Fasten gear to prevent shifting.
5. Do not exceed the "U.S. Coast Guard Maximum Capacities" information label (commonly called the Capacity Plate). This plate displays three important items: a) the maximum weight of persons on board in pounds; b) the maximum carrying weight of the vessel in pounds; and c) the maximum horsepower recommended for the boat.
6. If there is no capacity plate, use the following chart as a guide to determine the maximum number of persons you can safely carry in calm weather. The chart is applicable only to

mono-hull boats less than 20 feet in length. A mono-hull is a boat that makes a single "footprint" in the water when loaded to its rated capacity. For example, a catamaran, trimaran, or a pontoon boat is not a mono-hull boat.

Maximum Persons	1	2	2	3	4	5	6	7
Boat Length (feet)	6	8	10	12	14	16	18	20

Alternatively, you can use the following formula to determine the safe loading capacity when a capacity plate is not available.

Formulas For Safe Loading			
Horsepower Capacity:		**Person Capacity:**	
For small, flat-bottom boats:		Average weight per person is 150 lbs.	
Multiply boat length (feet) times transom width (feet)			
If answer is:	Maximum HP is:		
35 or less	3	(Boat length X Boat width) 15	= Number of People
36-39	5		
40-42	7.5		
43-45	10		
46-52	15		
Note: For flat-bottom, hard chine boats, with an answer of 52 or less, reduce one increment (e.g., 5 to 3).		Boat length and width are measured in feet. Round fractions down to next lower number.	

Always check the capacity plate to make sure you are not overloading or over-powering the vessel. A motor larger than recommended will make the stern too heavy and can cause the boat to flip. The transom will ride too low in the water and you could be swamped by your own wake or a passing boat's wake. Your boat will not sit properly in the water and will be difficult to handle.

Too many people (and/or gear) will also cause the boat to become unstable. Always balance the load so that your vessel maintains proper trim. Too much weight to one side or the other will cause the boat to list and increase the chance of taking on water. Too much weight in the bow causes the vessel to plow through the water and too much weight in the stern will create a large wake. All of these situations make the vessel difficult to handle and susceptible to swamping.

Anchoring

Anchoring is done for two principal reasons to stop and stay in one location and to keep you from running aground in bad weather, as a result of engine failure. Anchoring can be a simple task if you follow these guidelines:

1. Make sure you have the proper type of anchor (Danforth/plow/mushroom).
2. A 3- to 6-foot length of galvanized chain should be attached to the anchor. The chain will stand up to the abrasion of sand, rock, or mud on the bottom much better than a fiber line.
3. A suitable length of nylon anchor line should be attached to the end of the chain (this combination is called the "Rode"). The nylon will stretch under heavy strain cushioning the impact of the waves or wind on the boat and the anchor.
4. Determine depth of water and type of bottom (preferably sand or mud).

5. Calculate the amount of anchor line you will need. As a general rule, use five to seven times as much anchor line as the depth of water plus the distance from the water to where the anchor will attach to the bow. For example, if the water depth is 8 feet and it is 2 feet from the top of water to your bow cleat, you would multiply 10 feet x 5 to 7 to get the amount of anchor line to put out.
6. Secure the anchor line to the bow cleat at the point you want it to stop.
7. Bring the bow of the vessel into the wind or current.
8. When you get to the spot at which you want to anchor, place the engine in neutral.
9. When the boat comes to a stop, slowly lower the anchor. Do not throw the anchor over, as it will tend to entangle the anchor line.
10. When all anchor line has been let out, back down on the anchor with engine in idle reverse to help set the anchor.
11. When anchor is firmly set, use reference points (landmarks) in relation to the boat to make sure you are not drifting. Check these points frequently.

Do not anchor by the Stern!

Anchoring a small boat by the stern has caused many to capsize and sink. The transom is usually squared off and has less freeboard than the bow. In a current, the force of the water can pull the stern under. The boat is also vulnerable to swamping by wave action. The weight of a motor, fuel tank, or other gear in the stern increases the risk.

Fueling Precautions

Most fires and explosions happen during or after fueling of the boat. To prevent an accident follow these rules:

1. Portable tanks should be refueled ashore.
2. Close all hatches and other openings before fueling.
3. Extinguish all smoking materials.
4. Turn off engines, all electrical equipment, radios, stoves and other appliances.
5. Remove all passengers.
6. Keep the fill nozzle in contact with the tank and wipe up any spilled fuel.
7. Open all ports, hatches, and doors to ventilate.
8. Run the blower for at least 4 minutes.
9. Check the bilges for fuel vapors before starting the engine.
10. Do the “sniff test.” Sniff around to make sure there is no odor of gasoline anywhere in the boat.

Fuel Management

Practice the "One-Third Rule" by using:

1. One-third of the fuel going out
2. One-third to get back
3. One-third in reserve

Weather

You should never leave the dock without first checking the local weather forecast. You can get the weather information from the TV, radio, local newspaper, online, or from one of the weather channels on a very high frequency (VHF) radio.

At certain times of the year, weather can change rapidly and you should continually keep a "weather eye" out. While you are out in a boat, here are a few signs that indicate an approaching weather change.

1. Weather changes generally come from the west. Scan the sky, especially to the west.
2. Watch for cloud build-up, especially rapid vertically rising clouds.
3. Sudden drop in temperature.
4. Sudden change in wind direction and/or speed.
5. If you have a barometer on your boat, check it every 2 to 3 hours. A rising barometer indicates fair weather and rise in wind velocity; a falling barometer indicates stormy or rainy weather.

What To Do in Severe Weather

1. Reduce speed, but keep just enough power to maintain headway.
2. Put on your PFD.
3. Turn on running lights.
4. Head for nearest shore that is safe to approach, if possible.
5. Head the bow of the boat into the waves at about a 45-degree angle.
6. Keep bilges free of water.
7. Seat passengers on the bottom of the boat near the centerline.
8. If the engine fails, trail a sea anchor on a line from the bow to keep the boat headed into the waves. A bucket will work as a sea anchor in an emergency.
9. Anchor the boat, if necessary.

3.2.8 Hoisting and Rigging

Wire ropes, chains, ropes, and other rigging equipment will be inspected prior to each use and as necessary during use to assure their safety. Defective rigging equipment will be immediately removed from service.

Rigging will not be used unless the weight of the load falls within the rigging's safe work operating range. This must be verified by the authorized rigger prior to any "pick" or lifting operation.

Only personnel trained in safe rigging procedures will be authorized to engage in rigging procedures. Additionally, the rigger must understand and use recognized crane signals.

Job or shop hooks and links and other makeshift fasteners **shall not** be used. When U-bolts are used for eye splices, the U-bolt will be applied so the "U" section is in contact with the dead end of the rope.

Wire ropes, chains, ropes, and other rigging equipment shall be stored where they will remain clean, dry, and protected from the weather and corrosive fumes.

The proper length of rope or chain slings will be used to avoid wide-angle lifts and dangerous slack. Knotted ropes or lengths of ropes reduced by bolts, knots, or other keepers will not be used.

3.2.9 Cranes and Hoists

The use of cranes may take place during project activities, and carries many associated hazards. Potential contact with overhead electrical lines and potential crushing of workers who may wander into the swing path radius of the crane are just two. If cranes are brought to the work site for use, personnel will ensure that the following safety practices are enforced:

- Crane operator will provide a copy of the crane's annual inspection report to the SS prior to initiating operations.
- Operators of cranes and hoists will make visual and operational inspections of the equipment prior to use. Any discrepancies that would jeopardize the safe operation of the equipment will be corrected prior to use. These inspections are to be documented via a daily inspection checklist or equivalent.
- The posted capacity of the crane will be adhered to and overloading of the equipment will not be allowed.
- The accessible swing radius of the crane will be demarcated and/or barricaded to prevent employees from entering the area.
- The crane's load and boom will be kept a minimum of 10 feet away from utility lines and 20 feet from power lines. **Any deviation must be approved by the PM in conjunction with the RSHM.**
- A competent person will investigate the soil for stability and determine the necessary amount of "cribbing" to be placed under the outrigger pads or if crane mats are necessary.
- No personnel will be permitted to work under a suspended load.

- Except for emergency communications, the operator will only recognize signs and signals from one designated signal person. This signal person will serve as the crane operator's eyes in areas that the crane operator cannot see. This person will be familiar with crane signals, operation of the crane, and safe methods of securing and handling a load.

3.2.10 Manual Lifting

Proper lifting takes the hazard out of moving heavy objects. Below are some items that should be considered prior to a lift.

- Establish that you can lift the load safely; if the load is in excess of 50 pounds, you are required to ask for assistance
- Use a mechanical lifting device if available
- Inspect route to be traveled, confirming sufficient clearance
- Look for any obstructions or spills
- Inspect the object to determine how it should be grasped
- Look for any sharp edges, slivers, or other things that may cause personal injury
- Do not move any object that will obstruct your field of vision when transporting the load

When lifting objects, use the following proper lifting techniques:

- Feet must be parted, with one foot alongside the object being lifted and one foot behind. When the feet are comfortably spread, a more stable lift can occur and the rear foot is in a better position for the upward thrust of the lift.
- Use the squat position and keep the back straight - but remember that straight does not mean vertical. A straight back keeps the spine, back muscles, and organs of the body in correct alignment, and minimizes the risk of injury to internal organs.
- Grip is one of the most important elements of correct lifting. The fingers and the hand are extended around the object, using the full palm. Fingers have very little power, so use the strength of your entire hand.
- The load must be drawn close, and the arms and elbows must be tucked into the side of the body. Holding the arms away from the body increases the strain on the arms and elbows. Keeping the arms tucked in helps keep the body weight centered.

The body must be positioned so that the weight of the body is centered over the feet. This provides a more powerful line of thrust and also ensures better balance. Start the lift with a thrust of the rear foot. Do not twist.

3.2.11 Hand and Power Tools

Hand Tools

- Hand tools must meet the manufacturer's safety standards
- Hand tools must not be altered in any way

- At a minimum, eye protection must be used when working with hand tools
- Wrenches (including adjustable, pipe, end, and socket wrenches) must not be used when jaws are sprung to the point that slippage occurs
- Impact tools (such as drift pins, wedges, and chisels) must be kept free of mushroom heads
- Wooden handles must be free of splinters or cracks and secured tightly to the tool
- Any damaged or defective tools must be immediately removed from service and tagged for destruction

Power Tools

- All power tools must be inspected regularly and used in accordance with the manufacturer's instructions and the tool's capabilities
- Electric tools must not be used in areas subject to fire or explosion hazards, unless they are approved for that purpose
- Portable electric tools must be connected to a Ground Fault Circuit Interrupter (GFCI) when working in wet areas
- Proper eye protection must be used when working with power tools
- Personnel must be trained in the proper use of each specific tool
- Any damaged or defective power tools must be immediately tagged and removed from service

3.2.12 Electrical Hazards

Only qualified individuals will be allowed to perform work on electrical circuits or perform electrical work on equipment. No employee shall be permitted to work on any part of an electrical power circuit unless the person is protected against electric shock by de-energizing the circuit and grounding it, or ensuring that it has been locked and tagged out:

- All electrical wiring and equipment shall be a type listed by Underwriters Laboratories (UL) or Factory Mutual (FM) for the specific application.
- All installations shall comply with the National Electric Code (NEC) and the National Electric Safety Code (NESC).
- All electrical circuits shall be grounded according to NEC and NESC Code. GFCIs shall be used in the absence of properly grounded circuitry or when portable tools must be used around wet areas.
- Generators and like equipment will be grounded in accordance with NEC, unless exempted by NEC 250-6.
- All live wiring or equipment shall be guarded to protect all persons or objects from harm.

3.2.13 Control of Hazardous Energy

Hazardous energy sources may be encountered during the servicing and maintenance of machines and equipment, in which the unexpected energization or startup of the machines or equipment could cause injury to employees.

The minimum performance requirements to control hazardous energy requires that employers develop and implement an energy control program. The elements of an energy control program are as follows:

- Lockout/tagout
- Employee protection
- Energy control procedure
- Protective materials and hardware
- Periodic inspections
- Training and communication
- Energy isolation
- Employee notification

Project personnel who are required to conduct operations and maintenance activities that will require the isolation of an energy hazard using a lockout/tagout device shall follow the program requirements and written procedures for that operation.

Employee Training

Employees authorized to attach and remove lockout/tagout devices shall be provided with initial training regarding the safe application, usage, and removal of such devices. Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the associated energy, and the methods necessary for energy isolation and control.

All authorized employees will be provided with refresher training annually, or at more frequent intervals whenever the following conditions apply:

- A job assignment change
- A change in machinery or equipment, or a process change that presents new hazards
- A change in the energy control procedures
- Possible deficiencies in the employee’s understanding of the following
  - The hazards associated with the energy that controls the machinery or equipment in the employee’s work area
  - Application and removal procedures for lockout/tagout devices

Employees who work in areas where lockout/tagout procedures are used shall receive initial and annual refresher training in the purpose and use of lockout/tagout devices and principles behind their use.

3.2.14 Excavations

All excavation and trenching operations that employees shall enter will be observed by a designated competent person. The competent person shall be responsible for evaluating and inspecting excavation and trenching operations to prevent possible cave-in and entrapment, and to avoid other hazards presented by excavation activities.

Each employee in an excavation shall be protected from cave-ins by one of three systems:

- Sloping and benching systems
- Shoring
- Shielding systems

All excavation and trenching operations shall be conducted in accordance and in compliance with OSHA's Standards for the Construction Industry, specifically outlined in the SOP for excavation and trenching activities. At a minimum, the following safety guidelines shall be adhered to while conducting excavation and trenching activities:

- Excavation and trenching operations require pre-planning to determine whether sloping or shoring systems are required, and to develop appropriate designs for such systems. In addition, the estimated location of all underground installations must be determined before digging/drilling begins. Necessary clearances must be observed.
- If there are any nearby buildings, walls, sidewalks, trees, or roads that may be threatened or undermined by the excavation, or where the stability of any of these items may be endangered by the excavation, they must be removed or supported by adequate shoring, bracing, or underpinning.
- Excavations may **not** go below the base of footings, foundations, or retaining walls unless they are adequately supported or a person who is registered as a Professional Engineer (PE) has determined that they will not be affected by the soil removal. Civil engineers or those with licenses in a related discipline and experience should be consulted in the design and use of sloping and shoring systems. PE qualifications must be documented in writing.

Access and Egress

Personnel access and egress from trench and/or excavations are as follows:

- A stairway, ladder, ramp, or other means of egress must be provided in trenches greater than 4 feet deep and for every 25 feet of lateral travel.
- All ladders shall extend 3 feet above the top of the excavation.
- Structural ramps used for access or egress of equipment will be designed by a competent person qualified in structural design or by a licensed professional engineer.

Atmosphere Monitoring and Testing

Air quality is measured using three parameters: oxygen concentration, flammability, and the presence of hazardous substances.

Employees should not be exposed to atmospheres containing less than 19.5 percent oxygen or having a lower flammable limit greater than 10 percent, and employees should not be exposed to hazardous levels of atmospheric contaminants.

Whenever potentially hazardous atmospheres are suspected in excavations and trenches, the atmosphere shall be tested by a competent person. Gas monitors and explosion meters are examples of monitoring equipment that may be used.

In the event that an unusual odor or liquid is suspected in excavations and trenches, the competent person shall stop work at the work site and arrange for air quality assessment and mitigation, if necessary.

Atmospheric testing and monitoring shall be performed in excavations in or adjacent to landfill areas, in areas where hazardous materials are/were stored, or in areas where the presence of hazardous materials is suspected.

Daily Inspections

The competent person shall perform daily inspections of excavations, the adjacent areas, and all protective systems for situations that could potentially result in slope failure.

Additionally, the competent person shall be aware of the potential for confined space situations and other hazardous work conditions.

The competent person shall inspect, evaluate, and complete the excavation checklist at the following intervals:

- Prior to the start of work, after each extended halt in work, and as needed throughout the shift, as new sections of the excavation or trench are opened
- After every rainstorm and other natural or manmade event that may increase the load on the walls of the excavation, or otherwise affect their stability

The inspections shall be documented using the Underground Utilities Checklist included in Attachment 1.

The competent person shall stop the work and instruct all employees to leave the excavation or trench when any potential hazards are detected. The competent person has the authority to immediately suspend work if any unsafe condition is detected.

3.2.15 Compressed Gas Cylinders

Compressed gases present several hazards. The cylinder must be properly labeled, identifying the hazardous properties of the gas, such as toxicity, flammability, or the presence of an oxidizer, and a SDS must be supplied by the manufacturer. In addition to the gas hazards, compressed gas cylinders pose other hazards simply because they contain gas under pressure.

Regardless of the properties of the gas, any gas under pressure can explode if the cylinder is improperly stored or handled. Improperly releasing the gas from a compressed gas cylinder is extremely dangerous. A sudden release of the gas can cause a cylinder to become a missile-like projectile, destroying everything in its path. Cylinders have been known to penetrate concrete-block walls. To prevent such a dangerous situation, there are several general procedures to follow for the safe storage and handling of a compressed gas cylinder:

- Store cylinders in an area specifically designated for that purpose. This area must protect the cylinders from being struck by another object. The area must be well-ventilated, away from sources of heat, and at least 20 feet away from highly combustible materials. Oxidizers must be stored at least 20 feet away from flammable gases.
- Cylinders must not be dropped or allowed to fall. Chain and rack them in an upright position during use and storage. When transporting cylinders, they must be secured from falling.
- When moving a cylinder, even for a short distance, all the valves must be closed, the regulator removed, and the valve cap installed. Never use the valve cap to lift a cylinder. If you are using a crane or some other lifting device to move a cylinder, use a cradle or boat designed for that purpose. Never use a sling or a magnet to move a cylinder.
- Never permit cylinders to contact live electrical equipment or grounding cables.
- Cylinders must be protected from the sun’s direct rays, especially in high-temperature climates. Cylinders must also be protected from ice and snow accumulation.
- Before the gas is used, install the proper pressure-reducing regulator on the valve. After installation, verify the regulator is working, all gauges are operating correctly, and all connections are tight to ensure that there are no leaks. When you are ready to use the gas, open the valve with your hands. Never use a wrench or other tool. If you cannot open it with your hands, do not use it.

3.2.16 Fall Hazards

Personnel that will use ladders and have the potential hazard of working on elevated surfaces or platforms of 6 feet or greater during project activities shall follow the SOP for fall protection. The fall protection program includes leading edge work, rooftop work, aerial lifts, ladders, and scaffolds. Specific guidelines for portable ladders are outlined below.

The emergency rescue plan for retrieving any worker who has fallen and is suspended in air is as follows: Other personnel on-site will assist in retrieving fallen person. There will be no lone work when/if work at heights takes place. Local Emergency Medical Services (EMS) will also be used a resource for fall rescue. Time is of the essence to prevent the development of a life threatening condition, such as orthostatic intolerance or suspension trauma, due to being suspended for a period of time. Rescue methods and equipment will be specific to the work site; however, the following information provides examples of typical rescue methods/equipment:

- A scissor lift or articulating boom already on-site
- Lower/raise worker by an acceptable physical and/or mechanical means (self-rescue not acceptable as primary rescue method)

- A rescue team trained in above ground rescue techniques
- A rope or cable system to lower employee to ground (requires point of attachment for rigging tackle)
- A crane man-basket setup in advance for rescue

3.2.17 Portable Ladders

Employees who use ladders on work sites must be familiar with safe ladder usage.

- Activities conducted at elevated heights of 6 feet or more, or falls that are likely to result in death or serious harm, must employ suitable fall hazard control measures.
- Use the 4-to-1 ratio. Place the ladder so its feet are 1 foot away from what it leans against for every 4 feet in height to the point where the ladder rests. Example: If the top of a 16-foot ladder leans against a wall, its feet should be placed 4 feet from the wall. The "fireman's method" is a convenient way of checking the angle of the ladder. Place your toes against the base of the ladder; fully extend both arms toward the side rail and parallel to the ground. When standing erect you should be able to hold the ladder's side rails.
- Do not use a ladder in a horizontal position as a runway or a scaffold.
- Do not place a ladder in front of a door that opens toward it unless the door is locked, blocked, or guarded by someone.
- Place a portable ladder so that both side rails have a secure footing. Provide solid footing on soft ground to prevent the ladder from sinking.
- Place the ladder's feet on a substantial and level base, not on a movable object.
- On uneven surfaces, use a block, wedge, or ladder foot.
- On wet or oily pavement, a smooth floor, or an icy or metal surface, the ladder footing must be lashed, blocked, or otherwise secured.
- Do not lean a ladder against unsafe backing, such as loose boxes or barrels.
- When using a ladder for access to high places, securely lash or otherwise fasten the ladder to prevent it from slipping.
- To gain access to a roof or elevated platform, extend the ladder at least three rungs (3 feet) above the point of support.

Ascending or Descending of Ladders

- Maintain three points of contact at all times when going up or down. If material must be handled, raise or lower it with a rope.
- Always face the ladder when ascending or descending.
- Maintain clean, dry footwear as much as possible to prevent slipping on the rungs.

3.2.18 Slip/Trip/Hit/Fall

Slip/trip/hit/fall injuries are the most frequent of all injuries to workers, but can be minimized by the following prudent practices:

- Spot check the work area to identify hazards
- Establish and utilize a pathway free of slip and trip hazards
- Beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain
- Carry only loads you can see over
- Keep work areas clean and free of clutter, especially in storage rooms and walkways
- Communicate hazards to on-site personnel
- Secure all loose clothing and ties, and remove jewelry while around machinery
- Report and/or remove hazards
- Keep a safe buffer zone between workers using equipment and tools

3.2.19 Heat Stress

Recognition and Symptoms

Temperature stress is one of the most common illnesses faced by project personnel when working in elevated temperatures and/or humidity. Acclimatization and frequent rest periods must be established for conducting activities where temperature stress may occur. Below are listed signs and symptoms of heat stress. Personnel should follow appropriate guidelines if any personnel exhibit these symptoms:

- *Heat Rash:* Redness of skin. Frequent rest and change of clothing.
- *Heat Cramps:* Painful muscle spasms in hands, feet, and/or abdomen. Administer lightly salted water by mouth, unless there are medical restrictions.
- *Heat Exhaustion:* Clammy, moist, pale skin, along with dizziness, nausea, rapid pulse, fainting. Remove to cooler area and administer fluids.
- *Heat Stroke:* Hot dry skin; red, spotted, or bluish; high body temperature of 104°F; mental confusion; loss of consciousness; convulsions or coma. Immediately cool victim by immersion in cool water. Wrap with wet sheet and sponge with cool liquid while fanning; treat for shock. **Do not delay treatment. Cool body while awaiting ambulance.**

Work Practices

The following procedures will be carried out to reduce heat stress:

- Heat stress monitoring
- Acclimatization
- Work/rest regimes (schedule of breaks) - mandatory breaks scheduled in summer months or during high risk activities for heat stress

- Heat stress safety PPE (cool-vests, bandanas, etc.)
- Liquids that replace electrolytes, water, and salty foods available during rest
- Use of buddy system

Acclimatization

The level of heat stress at which excessive heat strain will result depends on the heat tolerance capabilities of the worker. Each worker has an upper limit for heat stress, beyond which the resulting heat strain can cause the worker to become a heat casualty. In most workers, appropriate repeated exposure to elevated heat stress causes a series of physiologic adaptations called acclimatization, whereby the body becomes more efficient in coping with the heat stress. Work/rest regimes should be planned as a component of project preparation and discussed during the daily tailgate safety meetings.

Worker Information and Training

All new and current employees who work in areas where there is a reasonable likelihood of heat injury or illness should be kept informed through continuing education programs (e.g., hazards, effects, preventative measures, drug/alcohol interaction).

3.2.20 Sun Exposure

Overexposure to sunlight is a common concern when field activities occur during warm weather conditions. Overexposure can occur on clear, sunny days as well as on overcast and cloudy days. Ultraviolet (UV) rays from the sun can cause skin damage or sunburn, but can also result in vision problems, allergic reactions, and other skin concerns. Two types of UV rays are emitted from the sun: UVA and UVB rays.

UVB rays cause sunburn, skin cancer, and premature aging of the skin. UVB rays stimulate tanning but are also linked to other problems such as impaired vision, skin rashes, and some allergic and other reactions to certain drugs. Extra care should be taken if activities are to be conducted on or near water. Sunlight reflected off the surface of the water is intensified resulting in accelerated effects. The following steps should be taken to protect against overexposure to sunlight:

- ***Always Use Sunscreen:*** Apply a broad spectrum sunscreen with Sun Protection Factor (SPF) of at least 15 or higher liberally on exposed skin. Reapply every 2 hours or more. Even waterproof sunscreen can come off when you towel off or sweat.
- ***Cover Up:*** Wearing tightly woven, loose-fitting, and full-length clothing is a good way to protect your skin from UV rays.
- ***Wear a Hat:*** A hat with a wide brim offers good sun protection to your eyes, ears, face, and the back of your neck - areas particularly prone to overexposure to the sun.
- ***Wear Sunglasses That Block 99 to 100 Percent of UV Radiation:*** Sunglasses that provide 99 to 100 percent UVA and UVB protection will greatly reduce sun exposure that can lead to cataracts and other eye damage. Check the label when buying sunglasses.

- ***Seek Shade:*** Shade is a good source of protection, but keep in mind that shade structures (e.g., trees, umbrellas, canopies) do not offer complete sun protection.
- ***Limit Time in the Midday Sun:*** The sun's rays are strongest between 10 a.m. and 4 p.m. Whenever possible, limit exposure to the sun during these hours.

3.2.21 Cold Stress

Cold stress is similar to heat stress, in that it is caused by a number of interacting factors including environmental conditions, clothing, and workload, as well as the physical and conditioning characteristics of the individual. Fatal exposures to cold have been reported in employees failing to escape from low environmental air temperatures or from immersion in low temperature water. Hypothermia, a condition in which the body's deep core temperature falls significantly below 98.6°F (37°C), can be life threatening. A drop in core temperature to 95°F (35°C) or lower must be prevented.

Air temperature is not sufficient to determine the cold hazard of the work environment. The wind chill must be considered as it contributes to the effective temperature and insulating capabilities of clothing. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the body's core temperature.

The body's physiologic defense against cold includes constriction of the blood vessels, inhibition of the sweat glands to prevent loss of heat via evaporation, glucose production, and involuntary shivering to produce heat by rapid muscle contraction.

The frequency of incidents increases with cold temperature exposures as the body's nerve impulses slow down, individuals react sluggishly, and numb extremities make for increased clumsiness. Additional safety hazards include ice, snow blindness, reflections from snow, and possible skin burns from contact with cold metal.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 95°F (35°C). This must be taken as a sign of danger to the employees on-site, and cold exposures should be immediately terminated for any employee when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

Predisposing Factors for Cold Stress

Certain predisposing factors make an individual more susceptible to cold stress. The project team members are responsible for informing the SS to monitor an individual, if necessary, or use other means of preventing/reducing the individual's likelihood of experiencing a cold related illness or disorder.

- Predisposing factors that will increase an individual's susceptibility to cold stress are listed below:
- *Dehydration:* The use of diuretics and/or alcohol, or diarrhea can cause dehydration. Dehydration reduces blood circulation to the extremities.

- *Fatigue during Physical Activity:* Exhaustion reduces the body's ability to constrict blood vessels. This results in the blood circulation occurring closer to the surface of the skin and the rapid loss of body heat.
- *Age:* Some older and very young individuals may have an impaired ability to sense cold.
- *Poor Circulation:* Vasoconstriction of peripheral vessels reduces blood flow to the skin surface.
- *Heavy Work Load:* Heavy workloads generate metabolic heat and make an individual perspire even in extremely cold environments. If perspiration is absorbed by the individual's clothing and is in contact with the skin, cooling of the body will occur.
- *Use of PPE:* PPE usage that traps sweat inside the PPE may increase an individual's susceptibility to cold stress.
- *Lack of Acclimatization:* Acclimatization, the gradual introduction of workers into a cold environment, allows the body to physiologically adjust to cold working conditions.
- *History of Cold Injury:* Previous injury from cold exposures may result in increased cold sensitivity.

Prevention of Cold Stress

A variety of measures can be implemented to prevent or reduce the likelihood of employees developing cold related ailments and disorders. These include acclimatization, fluid and electrolyte replenishment, eating a well-balanced diet, wearing warm clothing, the provision of shelter from the cold, thermal insulation of metal surfaces, adjusting work schedules, and employee education.

- *Acclimatization:* Acclimatization is the gradual introduction of workers into the cold environment to allow their bodies to physiologically adjust to cold working conditions. However, the physiological changes are usually minor and require repeated uncomfortably cold exposures to induce them.
- *Fluid and Electrolyte Replenishment:* Cold, dry air can cause employees to lose significant amounts of water through the skin and lungs. Dehydration affects the flow of blood to the extremities and increases the risk of cold injury. Warm, sweet, caffeine-free, non-alcoholic drinks and soup are good sources to replenish body fluids.
- *Eating a Well-Balanced Diet:* Restricted diets including low salt diets can deprive the body of elements needed to withstand cold stress. Eat high-energy foods throughout the day.
- *Warm Clothing:* Maintaining air space between the body and outer layers of clothing is beneficial in order to retain body heat. However, the insulating effect provided by such air spaces is lost when the skin or clothing is wet.
- *Work/Rest Regimes:* Schedule work during the warmest part of the day, if possible. Rotate personnel and adjust the work/rest schedule to enable employees to recover from the effects of cold stress.

The parts of the body most important to keep warm are the feet, hands, head, and face. As much as 40 percent of body heat can be lost when the head is exposed.

3.2.22 Adverse Weather Conditions

The SS shall decide on the continuation or discontinuation of work based on current and pending weather conditions. Electrical storms, heavy rains, hurricanes, tornado warnings, and sustained strong winds (approximately 40 mph) are examples of conditions that would call for the discontinuation of work and evacuation of the work site.

In addition, no work with elevated super structures (e.g., drilling, crane operations) will be permitted during any type of electrical storm, or during wind events that have wind speeds exceeding 40 mph.

3.2.23 Special Work Conditions/Situations

Contractors may be asked to conduct work that requires special precautions/considerations due to the following factors:

• Remote work locations.	Mandatory: No working alone, Journey Management Plan, call in procedure to include use of satellite phone if no cell or direct line access.
• Project site is in an area known for high crime or violence activity.	Mandatory: No working alone, police or security escort.
• Entry into abandoned buildings.	Mandatory: No working alone, call in procedure.
• Entry into wooded areas during hunting season.	Mandatory: No working alone, reflective vest, Journey Management Plan, call in procedure.
• Project work involving single employees (lone worker).	Mandatory: Call in procedure.

If these situations are possible, please consult with the RSHM to develop a plan.

3.2.24 Aggressive or Menacing Behavior

If confronted by an individual whose behavior becomes aggressive or menacing, staff should remain as calm as possible. Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call 911. Use the team approach. A staff member who is physically unable to break away from an attacker should shout for help.

The use of physical force is justified when a person believes that such force is necessary to protect himself or herself against the use or imminent use of unlawful physical force by another person. The use of physical force is also justified in the defense of another party, such as a co-worker, who is being subjected to unlawful physical force. Staff members can use any technique of legal self-defense in order to halt or distract an attacker until law officers arrive on the scene.

Should an aggressor only be interested in the taking or damaging of property, do not interfere. Obtain a description of the individual to provide to local authorities, including height, weight, race, sex, clothing, accent, unusual markings such as tattoos, facial piercings, scars, hair color, and weapon, if any.

File an Incident Report with your immediate supervisor who will forward the report accordingly.

3.3 Biological Hazards

On-site employees conduct numerous project activities that may encounter biological hazards, including bloodborne pathogens, insects, spiders, scorpions, rodents, snakes, and large predators. This section identifies precautions to be taken if these hazards are encountered.

3.3.1 Vegetation Overgrowth

Overgrown weeds, bushes, trees, grass, and other vegetation are fire and safety hazards. A number of hidden hazards may not be immediately recognized due to the overgrowth of vegetation in areas where field activities may occur, including discarded junk, litter, and debris. Construction materials such as boards, nails, concrete, and other debris may be hidden beneath tall grass, weeds, and bushes. Other hazards may include steep slopes, potholes, trenches, soft spots, dips, etc., all dangerously concealed from the view of the individual walking or operating motorized equipment in the area. Additionally, biological hazards such as snakes, ticks, chiggers, and mosquitoes may be present, as they breed in overgrowth conditions.

Here are some simple actions you can take:

- Assess the work area and determine if the area requires vegetation clearance. Consider that overgrowth extending above the lowest level of motorized equipment (i.e., bumper or fender) or 6 inches above your ankle has hidden hazards that you will not be able to readily identify.
- Determine if the area is safe to walk or whether you need motorized equipment. Consider the limitations of the equipment.
- Identify slip, trip, and fall hazards and remove from the general work area. Remember to give adequate clearance so that the items being removed do not pose future hazards.
- Adequately protect yourself against the hazards by wearing boots that protect the ankles, wearing long pants, and using insecticides.
- Consider the limitations of manual or mechanical equipment for the clearance of overgrowth, particularly the safety hazards when using sling blades, machetes, weed eaters, bush hogs, or other brush removing equipment.

Before taking any action, determine whether there any ecological issues that would affect or prevent the removal of overgrowth in protected areas such as wetlands, wildlife habitats, or sanctuaries for endangered and/or protected species.

3.3.2 Poisonous Plants

Common poison ivy grows as a small plant, a vine, and a shrub. Poison ivy occurs in every state. The leaves always consist of three glossy leaflets.

Poison sumac grows as a woody shrub or small tree 5 to 25 feet tall. It usually contains nine leaves, with eight paired leaves and one on top, and is common in swampy areas. The plants are potent sensitizers and can cause a mild to severe allergic reaction, referred to as “contact dermatitis.”

Dermatitis, in Rhus-sensitive persons, may result from contact with the milky sap found in the roots, stems, leaves, and fruit, and may be carried by contacted animals, equipment, or apparel.

The best form of prevention is to avoid contact. Wearing long sleeves, gloves, and disposable clothing, such as Tyvek, is recommended in high-risk areas to avoid exposure from contaminated apparel. Barrier creams and cleaners are also recommended.

3.3.3 Insects

Ticks

Ticks are blood feeding external parasites of mammals, birds, and reptiles throughout the world. Some human diseases of current interest in the United States caused by tick-borne pathogens include Lyme disease, ehrlichiosis, babesiosis, Rocky Mountain spotted fever, tularemia, and tick-borne relapsing fever. Lyme disease is caused by a bacterial parasite called spirochete and is spread by infected ticks that live in and near wooded areas, tall grass, and brush. The ticks that cause the disease in the Northeast and Midwest are often no bigger than a poppy seed or a comma in newsprint. The peak months for human infection are June through October. Many other tick-borne diseases, such as Rocky Mountain spotted fever, can be carried by a variety of ticks. The prevention and treatment of these diseases are similar to those of Lyme disease.

Prevention

Preventative measures include wearing light-colored clothing, keeping clothing buttoned, tucking pant legs in socks, and keeping shirttails tucked in. Periodic checks for ticks should be made during the day, and especially at night. Hair should also be checked by parting it and combing through it to make sure that no ticks have attached to the scalp. Also, check clothing when it is first removed, before ticks have a chance to crawl off. A shower or bath should be taken as soon as possible after leaving the work site for the day.

The most common repellent recommended for ticks is N, N-dimethyl-m-toluamide, or DEET. It is important to follow the manufacturer’s instructions found on the container with all insecticides, especially those containing DEET.

In general, DEET insect repellent should only be applied to clothing, not directly on the skin. Do not apply to sunburns, cuts, or abrasions. Use soap and water to remove DEET once indoors. However, the DEET user is required to read the insect repellant label and/or SDS for safe use requirements. If ticks are not responding to DEET or other safety methods, then the PM and RSHM are to be notified and additional safety controls may be utilized.

Removal

The best way to remove a tick is removal by tweezers. If tweezers are not available, cover your fingers (tissue paper) while grasping the tick. It is important to grasp the tick as close as possible to the site of attachment and use a firm steady pull to remove it. When removing the tick, be certain to remove all the mouth parts from your skin so as not to cause irritation or infection. Wash hands immediately after with soap and water, and apply antiseptic to the area where tick was removed. Get medical attention if necessary.

Symptoms of Lyme Disease

The first symptoms of Lyme disease usually appear from 2 days to a few weeks after a person is bitten by an infected tick. Symptoms usually consist of a ring-like red rash on the skin where the tick attached, and often red on the outside and clear in the center. The rash may be warm, itchy, tender, and/or "doughy" and appears in only 60 to 80 percent of infected persons. An infected person also has flu-like symptoms of fever, fatigue, chills, headaches, a stiff neck, and muscle aches and pains (especially knees). Rashes may be found some distance away from the original rash. Symptoms often disappear after a few weeks.

Bees, Wasps, and Yellow Jackets

Stinging insects are members of the order Hymenoptera of the class Insecta. There are two major subgroups: Apidae (honeybees and bumblebees) and vespids (wasps, yellow jackets, and hornets). Apidae are docile and usually do not sting unless provoked. The stinger of the honeybee has multiple barbs, which usually detach after a sting. Vespids have few barbs and can inflict multiple stings.

Types of stinging insects that might be encountered at this work site may include:

- Carpenter bees
- Bumblebees
- Mud dauber wasps
- Africanized killer bees
- Cicada killer wasps
- Giant hornets
- Honeybees
- Paper wasps
- Yellow jackets

Symptoms

If you are stung, three types of reactions are possible: a normal, a toxic, or an allergic reaction.

- *Normal Reaction:* Only lasts a few hours and consists of pain, redness, swelling, itching, and warmth near the sting area
- *Toxic Reaction:* Will last for several days, results from multiple stings, and may cause cramps, headaches, fever, and drowsiness
- *Allergic Reaction:* Can cause hives, itching, swelling, tightness in the chest area, and a possibility of breathing difficulties, dizziness, unconsciousness, and cardiac arrest.

The stingers of many Hymenoptera may remain in the skin and should be removed as quickly as possible without concern for the method of removal. An ice cube placed over the sting will reduce pain; aspirin may also be useful. Persons with known hypersensitivity to such stings should carry a kit containing epinephrine in a prefilled syringe. Antihistamines may help decrease hives and angioedema. Persons who have severe symptoms of anaphylaxis, have positive venom skin test results, and are at risk for subsequent stings should receive immunotherapy regardless of age or time since anaphylaxis.

Precautions

The following precautions can help you avoid stings. Try to wear light colored clothing and shy away from dark or floral prints. Avoid wearing perfumes, hairsprays, colognes, and scented deodorants while working outside. If eating outside, keep all food and drinks covered; sweet foods and strong scents attract stinging insects as well. Never swat or swing at the insect; it is best to wait for it to leave, softly blow it away, or gently brush it aside. Seek medical attention when the reaction to a sting includes swelling, itching, dizziness, or shortness of breath.

If physical control measures are not effective, use a pesticide that will have a minimal impact on both you and the environment.

Fire Ants

Fire ants are reddish-brown in color and range from 1/8 inch to 3/8 inch in length. When a fire ant stings an individual, the individual is rarely only stung once. Most fire ant stings result in a raised welt with a white pustule. If stung by a fire ant, continue to observe the welt and try to prevent secondary infection by keeping the welt intact. However, some individuals may have an allergic reaction to a fire ant sting and require immediate medical attention. Pesticides and even hot water can be used to kill fire ant colonies. Fire ants are normally seen in the southern states.

Mosquitoes

Mosquitoes are common pests that can be found in any state and any work environment where warm, humid conditions exist. Mosquitoes can pass along diseases such as West Nile virus and malaria. Several different methods can be used to control adult mosquito populations: repellants such as DEET, mosquito traps, foggers, and vegetation and water management.

3.3.4 Poisonous Spiders

Black Widow

Black Widow spiders are not usually deadly (especially to adults) and only the female is venomous. The female spider is shiny black, usually with a reddish hourglass shape on the underside of her spherical abdomen. Her body is about 1.5 inches long, while the adult male’s is approximately half that. The spider’s span ranges from 1 to 3 inches. The adult males are harmless, have longer legs, and usually have yellow and red bands and spots over their back, while the young black widows are colored orange and white. The bite of a black widow is often not painful and may go unnoticed. However, the poison injected by the spider’s bite can cause severe reactions in certain individuals.

Symptoms

Symptoms include abdominal pain, profuse sweating, swelling of the eyelids, pains to muscles or the soles of the feet, salivation and dry-mouth (alternating), and paralysis of the diaphragm. If a person is bitten, they should seek immediate medical attention. Clean the area of the bite with soap and water. Apply a cool compress to the bite location. Keep effected limb elevated to about heart level. Ask a doctor if acetaminophen or aspirin can be taken to relieve minor symptoms. Additional information can be obtained from the Poison Center (1 (800) 222-1222). Black widows are found throughout the tropics, U.S., and Canada.

Brown Recluse

Brown recluse spiders are usually light brown in color, but in some instances they may be darker. Brown recluse spiders are highly venomous spiders, native to the United States, and found coast to coast. The brown recluse can vary in size, but some can obtain bodies of 5/8 inches in length with a leg span of 1 1/2 inches in diameter. They can be identified by their three pairs of eyes along the head area and their fiddle shaped markings on the back. Most brown recluse bites are defensive rather than offensive. They generally only bite when they feel threatened.

Symptoms

If bitten by a brown recluse, an individual may experience open, ulcerated sores, which when left untreated may become infected and cause tissue necrosis. If an individual believes a spider has bitten them, they need to seek medical attention as soon as possible. In order to minimize the occurrence of brown recluse bites, individuals should shake their clothing and shoes thoroughly, eliminate the presence of cluttered areas, and spray the building perimeters with pesticides. Brown recluse are found throughout the U.S., Mexico, and Canada.

3.3.5 Threatening Dogs

If you are approached by a frightened or menacing dog:

- Do not attempt to run and do not turn your back.
- Stay quiet, and remember to breathe.
- Be still, with arms at sides or folded over chest with hands in fists.
- Slowly walk away sideways.
- Do not stare a dog in the eyes, as this will be interpreted as a threat.
- Avoid eye contact.
- If you have a jacket, you can wrap it around your arm to reduce harm, should the dog move to bite.

3.3.6 Rodents

Rodentia: (rats, mice, beavers, squirrels, guinea pigs, capybaras, coypu)

Rodents, or Rodentia, are the most abundant order of mammals. There are hundreds of species of rats; the most common are the black and brown rat.

The **Brown Rat** has small ears, blunt nose, and short hair. It is approximately 14 to 18 inches long (with tail). They frequently infest garbage/rubbish, slaughterhouses, domestic dwellings, warehouses, shops, and supermarkets; they also frequent any space with an easy meal and potential nesting sites.

The **Black Rat** can be identified by its tail, which is always longer than the combined length of the head and body. It is also slimmer and more agile than the Norwegian or Brown rat. Its size varies according to its environment and food supply.

The **House Mouse** has the amazing ability to adapt and now can frequently be found in human dwellings. In buildings, mice will live anywhere and they are very difficult to keep out. Mice are also omnivorous and will eat anything.

Rats and mice often become a serious problem in cold winter months when they seek food and warmth inside buildings. They may suddenly appear in large numbers when excavation work disturbs their in-ground nesting locations or their food source is changed.

There are six major problems caused by rats and mice:

1. They eat food and contaminate it with urine and excrement.
2. They gnaw into materials such as paper, books, wood, or upholstery, which they use as nest material. They also gnaw plastic, cinder blocks, soft metals such as lead and aluminum, and wiring, which may cause a fire hazard.
3. Rats occasionally bite people and may kill small animals.
4. They, or the parasites they carry (such as fleas, mites, and worms), spread many diseases such as salmonella, trichinosis, rat bite fever, hantavirus, Weil's disease, and the bubonic plague.
5. Rats can damage ornamental plants by burrowing among the roots or feeding on new growth or twigs. They also eat some garden vegetables, such as corn and squash.
6. Rats and mice are socially unacceptable. These rodents have been a problem for centuries, chiefly because they have an incredible ability to survive and are so difficult to eliminate. In addition, they are extremely compatible with human behavior and needs.

3.3.7 Snakes

Snakes may be found in any region of the country. While many snakes encountered are not venomous, a few are, so all snakes should be given a wide berth. Of the 7,000 venomous snakebites reported each year, only about 15 prove to be fatal, so your chances of survival are extremely high. The usual snake encounter is one in which they see you before you see them, and they slither away from you quickly, startling you. If you see a snake, back away from it slowly and do not touch it. If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snakebite.

Venomous snakes include the coral snake and pit vipers, such as the cottonmouth (water moccasin), copperhead, and rattlesnake. The venom of pit vipers is primarily *hematoxic* because it acts upon the victim's blood system. This venom breaks down blood cells and blood vessels and affects heart action. Bite victims experience severe burning pain, localized swelling and discoloration for the first 3 to 30 minutes, followed by nausea, vomiting, occasional diarrhea, and usually shock.

Preventing Snakebites

The best ways to prevent snakebites are to watch where you step, put your hands, or sit down. Poisonous snakes live on or near the ground and often like rocks, woodpiles, and other spots that offer both a place to sun and a place to hide. Most bites occur in and around the ankle. About 99 percent of all bites occur below the knee, except when someone accidentally picks up or falls on the snake.

Watching where you step and wearing boots in tall grass can prevent most snakebites. Snake chaps can also help protect against snakebites.

Signals that indicate a poisonous snakebite include:

- One or two distinct puncture wounds, which may or may not bleed - the exception is the coral snake, whose teeth leave a semicircular mark
- Severe pain and burning at the wound site immediately after or within 4 hours of the incident
- Swelling and discoloration at the wound site immediately after or within 4 hours of the incident

Emergency First Aid for Poisonous Snakebite

Although it is important to obtain medical aid immediately, emergency first aid can slow the spread of poison from the bite. Remain calm and avoid unnecessary movement, especially if someone is with you. The rate of venom distribution throughout your body will be slower if you are still and quiet. *Do not* use home remedies, and *do not* drink alcoholic beverages.

To care for a bite from a pit viper, such as a rattlesnake, copperhead, or cottonmouth, follow these steps:

- Call 9-1-1 or the local emergency number
- Wash the wound
- Keep the injured area still and lower than the heart; if possible, carry a person who must be taken to a medical facility or have him or her walk slowly
- Do not apply ice
- Do not cut the wound
- Do not apply suction
- Do not apply a tourniquet
- Do not use electric shock, such as from a car battery

Care for a bite from an elapid snake, such as a coral snake, is the same as for a pit viper, except that after washing the wound you should apply an elastic roller bandage by following these steps:

- Check for feeling, warmth, and color of the limb beyond where you will be placing the bandage by noting changes in skin color and temperature.
- Place the end of the bandage against the skin and use overlapping turns.
- Gently stretch the bandage as you continue wrapping. The wrap should cover a long body section, such as an arm or a calf, beginning at the point farthest from the heart. For a joint like a knee or ankle, use figure-eight turns to support the joint.
- Always check the area above and below the injury site for feeling, warmth, and color, especially fingers and toes, after you have applied an elastic roller bandage. By checking before and after bandaging, you will be able to tell if any tingling or numbness is from the bandaging or the injury.

- Check the snugness of the bandaging a finger should easily, but not loosely, pass under the bandage.
- Keep the injured area still and lower than the heart. If possible, carry a person who must be taken to a medical facility or have him or her walk slowly.
- Do not apply ice.
- Do not cut the wound.
- Do not apply suction.
- Do not apply a tourniquet.
- Do not use electric shock, such as from a car battery.

3.3.8 Scorpions

Forty different types of scorpions are found in the U.S. ***All the different types are located in the southern states.***

Wind scorpions, including sun scorpions, are easily recognized by the pair of large, pincer-like chelicerae on the head in front of the mouth and by the slight, waist-like constriction near the middle of the body. Unlike the broadly joined cephalothorax and abdomen of scorpions, wind scorpions have three distinct body regions - a segmented cephalothoracic area with two eyes at the front margin, a three-segmented thorax, and a ten-segmented abdomen.

Death by a scorpion sting, if it occurs, is the result of heart or respiratory failure some hours after the incident.

3.3.9 Alligators/Crocodiles

Alligators, crocodiles, and gharials make up the group of animals known as crocodilians. Crocodilians are the world's largest reptiles. The American alligator or *Alligator mississippenisis* is the least aggressive crocodilian.

Similar to snakes, lizards, and other reptiles, alligators are cold-blooded (or ectothermic), meaning the air or water temperature around them determines their body temperature. The **American alligator** primarily ***inhabits the southeastern U.S.: Alabama, Arkansas, North and South Carolina, Florida, Georgia, Louisiana, Mississippi, Oklahoma, and Texas.*** They primarily live in freshwater swamps and marshes, but also in rivers, lakes, and smaller bodies of water. They can tolerate a reasonable degree of salinity for short periods of time as they are occasionally found in brackish water around mangrove swamps, although they lack the buccal salt-secreting glands present in crocodiles. Adult males typically reach 4 to 4.5 meters (approximately 13 to 14.7 feet). Alligators are classified as a threatened species and thus enjoy the protection of state and federal law. State and federal law prohibits people from killing, harassing, molesting, or attempting to move alligators. The potential for being bitten or injured by a provoked alligator is high. Maintain a distance of at least 15 feet from any alligator. Fifteen feet is the outside range for the alligator's frightening burst of speed.

If an alligator attacks:

Run away in a straight line. Crocodiles and alligators will outrun you for about 30 feet (10 meters) or so at speeds up to 20 mph, after which they will need to rest. They will have no trouble out swimming you, however.

If an alligator has grabbed you:

- Hit it repeatedly on its relatively sensitive nose, poke it in the eyes, and scream. Alligators do not like resistance.
- Do not try to pry the jaws open
- Play dead. They stop shaking their prey when they think that it is dead, wedging the body in their pantry for later consumption. This is when you can escape.

Seek immediate medical attention if you are bitten by an alligator. Alligators harbor very infectious bacteria, and even minor bites may require special treatment.

3.3.10 Bloodborne Pathogens

Hepatitis and other communicable diseases are largely transmitted through exposure to bodily fluids containing the hepatitis virus, which could be found on refuse encountered in subsurface investigations. This could also be encountered during activities occurring at landfills, sewage treatment facilities, and sewers, and locations where topical spreading of treated waste and medical wastes (e.g., contaminated needles and syringes) occurs. Individuals performing tasks for these types of projects should consult with their physicians and be properly vaccinated. The primary method of transmission depends on the prevalence of the disease in a given area.

Hepatitis A is a liver disease caused by the hepatitis A virus. Hepatitis A can affect anyone and can occur in situations ranging from isolated cases of disease to widespread epidemics.

Hepatitis B is a serious disease caused by a virus that attacks the liver. The virus, which is called hepatitis B virus (HBV), can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death.

Hepatitis C is a liver disease caused by the hepatitis C virus (HCV), which is found in the blood of persons who have the disease. HCV is spread by contact with the blood of an infected person.

Hepatitis D is a liver disease caused by the hepatitis D virus (HDV), a defective virus that needs the hepatitis B virus to exist. HDV is found in the blood of persons infected with the virus.

Hepatitis E is a liver disease caused by the hepatitis E virus (HEV) and is transmitted in much the same way as hepatitis A virus. Hepatitis E, however, does not often occur in North America.

Prevention

Preventative measures include wearing appropriate PPE: leather work gloves, a long sleeved shirt, and safety footwear. Several vaccines have been developed for the prevention of hepatitis B and C virus infection. Vaccines rely on the use of one of the viral proteins (hepatitis B surface antigen or HBsAg). The vaccine was originally prepared from plasma obtained from patients who had long-standing hepatitis B virus infection. However, currently these are more often made using recombinant technology, though plasma-derived vaccines continue to be used; the two types of vaccines are equally effective and safe.

4. Personal Protective Equipment (PPE)

4.1 General

This section shall cover the applicable PPE requirements, which shall include eye, face, hand, head, foot, and respiratory protection.

The purpose of PPE is to shield or isolate individuals from the chemical and physical hazards that may be encountered during work activities.

4.2 Types of PPE

The type of PPE required for a project will vary based on the level of protection required to protect the employee from physical, chemical, biological, and thermal hazards.

4.2.1 Types of Protective Material

Protective clothing is constructed of a variety of different materials for protection against exposure to specific chemicals. No universal protective material exists. All will decompose, be permeated, or otherwise fail to protect under certain circumstances.

Fortunately, most manufacturers list guidelines for the use of their products. These guidelines usually concern gloves or coveralls and generally only measure rate of degradation (failure to maintain structure). It should be noted that a protective material may not necessarily degrade but may allow a particular chemical to permeate its surface. For this reason, guidelines must be used with caution. When permeation tables are available, they should be used in conjunction with degradation tables.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all on-site personnel using PPE:

- When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift.
- Inspect all clothing, gloves, and boots both prior to and during use for:
  - Imperfect seams
  - Non-uniform coatings
  - Tears
  - Poorly functioning closures
- Inspect reusable garments, boots, and gloves both prior to and during use for:
  - Visible signs of chemical permeation
  - Swelling

- Discoloration
- Stiffness
- Brittleness
- Cracks
- Any sign of puncture
- Any sign of abrasion

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above will be discarded. PPE used in areas known or suspected to exhibit elevated concentrations of chemicals will not be reused.

4.3 Levels of Protection

The level of protection must correspond to the level of hazard known or suspected in the specific work area. PPE has been selected with specific considerations to the hazards associated with work site activities. The specific PPE to be used for each activity is outlined in each JSA table located in Attachment 2.

- All PPE will be disposed of and/or decontaminated at the conclusion of each workday as described below. Decontamination procedures will follow the concept of decontaminating the most contaminated PPE first.
- All disposable equipment shall be removed before meal breaks and at the conclusion of the workday, and replaced with new equipment prior to commencing work.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited while working in areas where the potential for chemical and/or explosive hazards may be present. Personnel must wash thoroughly before initiating any of the aforementioned activities.

4.3.1 Reassessment of Protection Levels

Protection levels provided by PPE selection shall be upgraded or downgraded based upon a change in work site conditions or the review of the results of air monitoring or the initial exposure assessment-monitoring program, if one was conducted.

When a significant change occurs, the hazards shall be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase
- Change in job tasks during a work phase
- Change of season/weather
- Temperature extremes or individual medical considerations limit the effectiveness of PPE
- Chemicals other than those expected to be encountered are identified
- Change in ambient levels of chemicals

- Change in work scope, which affects the degree of contact with areas of potentially elevated chemical presence

All proposed changes to protection levels and PPE requirements will be reviewed and approved prior to their implementation by the SS.

5. Air Monitoring Program

Inhalation hazards are caused from the intake of vapors and contaminated dust. Air monitoring shall be performed while intrusive activities are taking place to detect the presence and relative level of those air contaminants that are inhalation hazards. The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed. Initial screening for identification is often qualitative, but the determination of its concentration (quantification) must await subsequent testing.

All instruments will be calibrated on a daily basis in accordance with the manufacturer's guidelines. Records of all calibrations and real-time measurements will be kept in a bound field logbook or documented via air monitoring and calibration log sheets.

When air monitoring is required, the workers breathing zone(s) will be monitored and the results recorded. Additionally, area samples at the following locations will be taken daily. Record time, location, and results of monitoring and actions taken based on the readings:

- Upwind of work areas to establish background concentrations
- In support zone to check for contamination or migration of emissions
- Along decontamination line to check that decontamination workers are properly protected and on-site workers are not removing protective equipment in a contaminated area
- Downwind of work area to track any contaminants/emissions leaving the work site

The data collected throughout the monitoring effort shall be used to determine the appropriate levels of protection. Action levels for upgrading or downgrading of PPE have been established and Table 2 presents the action levels for the on-site Air Monitoring Program.

5.1 Exposure Monitoring

5.1.1 Multi-Gas Meters (LEL/O_2/H_2S/CO Meters)

The multi-gas meter is a combination indicator typically including oxygen, carbon monoxide, hydrogen sulfide, and combustible gas, which simultaneously analyzes concentrations of each contaminant in air. When used properly, the portable oxygen indicator will read the percent oxygen in the immediate atmosphere; the normal ambient oxygen concentration is 20.9 percent at sea level.

Action levels for each contaminant being monitored can be found in Table 2, which includes parameters, action levels, and actions to be taken.

5.1.2 Monitoring Frequency

Monitoring will be conducted continuously during ground intrusive activities or during any activity where airborne hazards (e.g., organic vapors) may be present. The monitoring equipment listed per work activity relates to the initial level of protection. The monitoring frequency may be decreased if the work areas and activities are unchanging, the result of the first hour of monitoring indicate contaminant concentrations are non-detect, and no differing conditions are observed.

Monitoring results will be legibly documented each workday. They will note project name/number, date, time, serial number, date of last calibration, name of person performing calibration, name of person performing monitoring, monitor location within the work site, and monitoring results. Daily documentation will be kept with the SS and included in the project file.

5.1.3 HSE Action Levels

An action level is a point at which increased protection or cessation of activities is required due to the concentration of contaminants in the work area. All activities shall be initiated in Modified Level D. The appropriate actions are to be taken at designated action levels. The initial action level(s) can be located in Table 2.

In addition to the action level, an upgrade to Level C is required if:

- Any symptoms of chemical exposure occur, as described in Table 1
- Requested by an individual performing the task
- Any irritation to eye, nose, throat, or skin occurs

A work stoppage and evacuation (cease and desist) at the specific work area is required if levels in the breathing zone exceed the protection factor of the respirator.

6. Site Control

The purpose of site control is to minimize potential contamination of workers and protect the public from hazards found on the work site. Site control is especially important in emergency situations.

- Site control and work area demarcation will be achieved through posting of signage and placement of barricades. All construction areas will have the appropriate signage posted. Barricades and warning signs will be placed to warn personnel of potential hazards. A standby person (spotter) may be utilized in place of barricades, where appropriate. The following materials may be used to barricade construction areas, crane swing radius, and control traffic:
  - Temporary fence
  - High visibility tape, rope, or chains
  - Traffic cones
  - Sawhorses
  - Wood or metal guardrails

One pathway should be established for heavy equipment and one for personnel decontamination.

The majority of work site operations, as well as access to the work site, could be controlled from the support zone. The support zone will provide for team communications, emergency response, and sanitary facilities. Appropriate safety and support equipment also will be located in this zone.

The support zone will be located upwind of work site operations if possible, and would be used as a potential evacuation point if appropriate. No potentially contaminated personnel or materials are allowed in this zone.

6.1 Communication

Each member of the project team will be able to communicate with other team members at all times. Communications will be by way of an air horn, walkie-talkie, cell phones, or hand signals.

The primary means for external communication are cell phones and radio.

Understanding of the following standard hand signals will be mandatory for all employees, regardless of other means of communication:

- Hand gripping throat - Cannot breathe
- Hands on top of head - Need assistance
- Thumbs up - OK; I'm all right; I understand
- Thumbs down - No; negative
- Gripping partner's wrist, or gripping both of your own hands on wrist (if partner is out of reach) - Leave area immediately

6.2 Buddy System

A buddy system shall be implemented when conducting intrusive activities at the Site. This buddy shall be able to:

- Provide his or her partner with assistance
- Observe his or her partner for signs of chemical exposure or temperature stress
- Periodically check the integrity of his or her partner's protective clothing
- Notify emergency personnel if emergency help is needed

6.3 Site Security

Site security is necessary to prevent the exposure of unauthorized, unprotected people to work site hazards and to avoid interference with safe working procedures. Security shall be maintained outside of the actual work area(s) as to prevent unauthorized entry into the work area(s). Members of the general public are to be protected from work site hazards.

A "No Trespassing Violators Will Be Prosecuted" sign is posted at the North and South Impoundment entrances. Only authorized personnel is to be allowed in this area.

Prior to any planned fieldwork, contact the security company and provide date and time of work.

First time work site visitors, at a minimum, should be accompanied by personnel familiar with the work site's layout and procedures.

6.4 Decontamination

The following are questions/items that may need to be addressed based on work site-specific protocols:

- Is formal equipment and/or personal decontamination necessary? If so, what measures will be implemented to manage residual wash waters, sediments, soils, etc.? Disposal measures for used/spent PPE?
- Does a decontamination pad already exist?
- What type(s) of equipment and decontamination cleansers/reagents will be necessary?
- Will wipe sampling and/or other forms of verification be required?
- Is there a decontamination pad/facility present at the work site or will a pad need to be constructed? Location(s) of permanent and/or temporary facilities?
- Who is responsible for disposal of any wastes generated by decontamination activities?

The SS is responsible for ensuring that all personnel and pieces of equipment going off-site are properly decontaminated according to the procedures outlined below. Documentation of decontamination must be made in the field log notebook and will become part of the permanent project file.

6.4.1 Personnel and Equipment Decontamination Procedures

All PPE will be disposed of and/or decontaminated at the conclusion of each workday as described below. Decontamination procedures will follow the concept of decontaminating the most contaminated PPE first.

All disposable equipment shall be removed before meal breaks and at the conclusion of the workday, and will be replaced with new equipment prior to commencing work.

Procedures for decontamination must be followed to prevent the spread of contamination and to eliminate the potential for chemical exposure:

- ***Personnel:*** Decontamination will be initiated prior to exiting the contaminated work area and completed in the Contamination Reduction Zone.
- ***Modified Level D:*** First, remove outer protective wear. Remove gloves and properly dispose in designated waste container. Wash hands and face.
- ***Equipment:*** All equipment must be decontaminated with Alconox/Liquinox solution or discarded upon exit from the contaminated area in a well-ventilated area. A temporary decontamination pad with a low-volume high-pressure washer will be set up on-site during project operations. All decontamination materials will be drummed for subsequent disposal.

7. Emergency Procedures

7.1 On-Site Emergencies

Emergencies can range from minor to serious conditions. Various procedures for responding to work site emergencies are listed in this section. The PM or SS is responsible for contacting local emergency services, if necessary, for specific emergency situations. Various individual work site characteristics will determine preliminary action to ensure that these entry procedures are successfully implemented in the event of an emergency. The project team will address necessary facility/Implementing Party emergency protocols to ensure compatibility between this document and facility/Implementing Party programs and expectations.

An Emergency Information Sheet containing the hospital location, directions, government agency phone numbers, emergency phone numbers, and a map with directions to the hospital is located in at the front of this HASP.

7.2 Incident, Injury, and Illness Reporting and Investigation

Any work-related incident, injury, illness, exposure, or property loss must be reported the SS, and **within 1 hour** to management. Motor vehicle accidents must also be reported through this system. The Incident Reporting Form, located in Attachment 1, must also be filled out and provided to the SS. The report must be filed for the following circumstances:

- Incident, injury, illness, or exposure of an employee
- Injury of a subcontractor
- Damage, loss, or theft of property
- Any motor vehicle accident, regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle while the employee is acting in the course of employment

Occupational incidents resulting in employee injury or illness will be investigated by the SS. This investigation will focus on determining the cause of the incident and modifying future work activities to eliminate the hazard.

All employees have the right and obligation to report unsafe work conditions, previously unrecognized safety hazards, or safety violations of others. If you wish to make such a report, it may be made orally to your supervisor or other member of management, or you may submit your concern in writing, either signed or anonymously.

7.3 Emergency Equipment/First Aid

Safety equipment will be available for use by site personnel, located within 30 feet of the work area(s), and maintained at the work site. The safety equipment may include, but is not limited to, the following:

- First Aid kit (size is dependent upon the number of personnel on-site):
  - Contents**:** Each first aid kit shall contain, as a minimum (ANSI 308.1-2003):

- 1 Absorbent Compress (32 square inches, no side less than 4 inches)
- 16 Adhesive Bandages (1 inch x 3 inches)
- 1 Adhesive Tape (roll, 3/8 inch x 5 yards)
- 10 Individual Antiseptic (0.5 g)
- 6 Burn Treatments (Antibiotic) (each 1/32 oz.)
- 2 Pairs of Medical Exam Gloves (not to be reused)
- 4 Sterile Pads (3 inches x 3 inches)
- 1 Triangular Bandage

- Automated External Defibrillators (AEDs) are optional first aid response equipment for conditions related to heart stoppage. If a unit is on site, designated personnel must be trained in the specific AED unit in addition to First Aid and CPR certification, conduct monthly inspections, and contact listed AED Unit coordinator.
- Emergency eyewash bottles and/or an eyewash station lasting 15 minutes.
- Emergency alarms as a means to alert all personnel instantaneously for an emergency.
- Fire extinguisher (at a minimum, a 2A/10BC will be on-site).

7.4 Emergency Procedures for Contaminated Personnel

Whenever possible, personnel should be decontaminated in the contamination reduction zone before administering first aid, without causing further harm to the patient.

- ***Skin Contact:*** Remove contaminated clothing, wash immediately with water, and use soap, if available.
- ***Inhalation:*** Remove victim from contaminated atmosphere. Remove any respiratory protection equipment. Initiate artificial respiration, if necessary. Transport to the hospital.
- ***Ingestion:*** Remove victim from contaminated atmosphere. Do not induce vomiting if victim is unconscious. Never induce vomiting when acids, alkalis, or petroleum products are suspected. Transport to the hospital, if necessary.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a listing of the contaminants of concern to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated, as necessary.

7.5 Site Evacuation

In the event of an emergency situation such as fire, explosion, or significant release of toxic gases, project personnel in the field will be notified by cell phone established communications to evacuate the area. In the event of an emergency, personnel will gather at their primary mustering point for a head count. The SS will determine a primary and secondary muster point to be used as an assembly area in the event of an emergency. The secondary muster point will be located at least 90 degrees from the primary. These locations will be communicated to the work crew(s) during the work site-specific training prior to commencement of work activities, weekly thereafter, and prior to the advent of potentially threatening weather. Muster points and evacuation routes will be identified during the tailgate safety meeting.

During work over water (boating, barge drilling, excavation, etc.), the SS will determine an appropriate docking location to transfer personnel from the water to the land so they can be transported to a hospital or clinic. Two boat launches are present in the vicinity of the north impoundment, where work over water will occur. The nearest boat launch is located at the San Jacinto River Fleet Facility approximately 1.5 boating miles west of the northern impoundment. The second is located at the Riverside Inn Marina, approximately two boating miles west of the northern impoundment.

7.6 Spill and Release Contingencies

If a spill has occurred, the first step is personal safety, then controlling the spread of contamination, if possible. Personnel will immediately contact work site management to inform them of the spill and activate emergency spill procedures.

8. Recordkeeping

The SS shall establish and maintain records of all necessary and prudent monitoring activities as described below:

- Name and job classification of the employees involved on specific tasks
- Air monitoring/sampling results and instrument calibration logs
- Records of training acknowledgment forms (work site-specific training, toolbox meetings, etc.)
- Documentation of work site inspections, results of inspections, and corrective actions implemented
- Emergency reports describing any incidents or accidents

Attachment 2
Emergency Response Plan

Attachment 2 - Emergency Response Plan - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11187072 **|** Report No 12

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1. Introduction

This Emergency Response Plan (ERP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). This ERP complies with the EPA *Remedial Design/Remedial Action Handbook* and Occupational Safety and Health Administration (OSHA) standard for Hazardous Waste Operations and Emergency Response; Final Rule (29 Code of Federal Regulations [CFR] § 1910.120(1)(2) to plan for potential emergencies prior to the commencement of hazardous waste operations. References in this ERP to the “work site” are to the Southern Impoundment and references to “Implementing Party” are to the entity(ies) implementing the remedial action (RA) for the Southern Impoundment.

Major incidents at the work site that may require emergency response would include: severe weather, fire, explosion, chemical reaction, truck rollovers, off-site accidents involving transport vehicles, spills or other incidents that may be immediately dangerous to human health and safety of on-site personnel and nearby residents and/or the environment.

2. Pre-Emergency Planning

2.1 Coordination with Outside Parties

During any emergency events on-site, personnel may coordinate and communicate with the following authorities (as necessary):

- EPA Region 6
- Harris County Sheriff
- Channelview Fire Department
- Texas Commission on Environmental Quality (TCEQ)
- Texas Railroad Commission (TRRC)
- Texas Department of Transportation (TxDOT)
- United States Coast Guard (USCG)
- Port of Houston Authority (POHA)

A meeting with these authorities may be requested and conducted by the Implementing Party prior to the commencement of intrusive RA activities at the work site, in order to facilitate a coordinated, integrated, and timely response for any emergencies that may occur during intrusive field activities which represent a potential for release of hazardous material. Topics that will be discussed/reviewed at the meeting will include the following:

- Site history/historical response actions
- Nature and extent of contamination
- Nature and duration of anticipated RA field activities

- Health and Safety Plan (HASP) contents
- ERP contents
- Transportation Routes
- Emergency response support that can be provided by local emergency response authorities

A copy of the sign-in sheet for those who attend the meeting will be maintained on file at the work site.

2.2 Initial Notification Procedures

To minimize hazards to human health and safety and/or the environment, in the event of a fire, explosion, spill, or release involving a hazardous substance including oil, raw materials and by-products, or hazardous waste, it is the responsibility of on-site personnel to immediately report any such releases to the Site Supervisor. The Site Supervisor will be responsible for implementing emergency procedures, if necessary, and for notification of appropriate project specific contacts and local emergency response authorities listed in Table 1.

2.3 Emergency Contacts

The emergency telephone numbers for the local emergency response authorities and other local, state, and federal authorities are presented in Table 1. The closest hospital to the work site is located approximately 9 miles east of the work site, in Baytown, Texas. The emergency telephone numbers and the emergency route to the hospital will be posted at the work site prior to commencement of activities and are included in the Site HASP.

Table 1 Emergency Information

EMERGENCY INFORMATION		
Contact	**Phone Number**	**Site Location, Hospital & Clinic Directions**
Local Police:	911	**Southern Impoundment:**
Harris County Constable	(713) 637-0014	18003 Market St. Channelview, Texas 77530
Baytown Police Department	(281) 422-8371	(29.791692, -95.066069)
Local Fire Department:	911	
Channelview Fire Department	(281) 452-5782	
Ambulance	911	

3. Emergency Recognition and Prevention

This section describes the methods and procedures to be used to recognize and prevent or minimize the adverse effects of any releases of hazardous materials that may occur at the work site.

3.1 Emergency Recognition

On-site personnel will be prepared to recognize and report to the Site Supervisor any incident (e.g., fire, explosion) or releases of hazardous materials which may endanger human health and safety or the environment. Specifically, when personnel discover such an incident or release of a hazardous material, the following procedures will be followed:

- Report the incident/release to the Site Supervisor
- The Site Supervisor will determine if the incident/release represents an emergency and, if so, will immediately notify the Project Manager and local emergency response authorities, if necessary.

Personnel in the affected area(s) will immediately evacuate the area of release or the work site in accordance with the "Evacuation Procedures", presented in Section 6.

3.2 Release Prevention Measures

The following procedures/measures may be implemented at the work site to prevent potential releases of or minimize the impact of releases of hazardous materials:

- Hazardous operations will not be conducted when meteorological conditions, (e.g., wind speed/direction or precipitation) would result in a significant risk to human health and safety or the environment, should a release occur.
- All potential hazardous material generated during activities (i.e., impacted soils, dewatering fluids, decontamination fluid, used PPE, etc.) will be placed onto the appropriate staging pads or placed in compatible containers.
- The Site Supervisor will be accountable for hazardous materials spill/release prevention, and is responsible for properly instructing on-site personnel in the operation and maintenance of equipment to prevent the discharges of hazardous materials.
- A supply of spill/release response materials and emergency safety equipment will be stored at the work site during activities to immediately respond to releases/emergencies.
- On-site personnel will be capable of providing immediate response in order to contain and/or mitigate spills and releases.
- If necessary, a meeting will be conducted with local emergency response authorities in order to facilitate a coordinated, integrated and timely response for any emergencies that on-site personnel are unable to contain and/or control.

4. Personnel Roles

This section of the ERP describes the various personnel roles, responsibilities, lines of authority and communication procedures that will be followed by on-site personnel involved in responses to incidents or emergencies.

4.1 Site Supervisor

The Site Supervisor may be responsible for implementing on-site emergency response procedures and directing the on-site and emergency personnel. All on-site personnel and their communications will be coordinated through the Site Supervisor. Specific duties of the Site Supervisor may be as follows:

- Initially identify the source and character of the incident and the type and quantity of any release. Assess possible hazards to human health or the environment in consultation with the Safety and Health Officer that may result directly from the problem or its control.
- If the incident may threaten human health or safety of on-site personnel, immediately determine whether evacuation of the Site is necessary in consultation with the Project Manager and EPA Remedial Project Manager (RPM).
- If the incident does not threaten human health or safety of on-site personnel or nearby residents or the environment, determine if on-site personnel can contain or control the incident or release. If not, notify local emergency response authorities identified above in Table 1.
- Direct on-site personnel to control the incident or release until, if necessary, outside emergency response help arrives. Specifically ensure that the location where the incident/release occurred and the surrounding area are evacuated and all operations in the vicinity of the incident are discontinued to ensure that fire, explosions, or spills do not spread. Direct work site personnel not involved in emergency response actions to avoid the area of the incident and leave emergency control procedures unobstructed and ensure protected personnel are on standby for emergency rescue, if necessary.
- If hazardous materials have been released or produced through control of the incident, ensure that containers of material are removed or isolated from the immediate location of the emergency.
- Per regulations developed under the Comprehensive Environmental Response Compensation Liability Act (CERCLA) of 1980 (Superfund), a spill/release of one pound or more of any hazardous substance for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or Toxic Substances Control Act (TSCA), will be reported.
- Determine, in consultation with the Safety and Health Officer, when the emergency has passed and initiate an "all clear" signal to notify on-site personnel of such.
- Ensure that all emergency equipment used is decontaminated, recharged, and/or fit for its intended use before work site operations are resumed.
- Record time, date, and details of the incident, and submit a written incident report to the EPA within 20 days of the release, if the release is at or above reportable quantities.

4.2 Health and Safety Officer

This individual may be responsible for identifying and evaluating actual and potential hazards and provide oversight of emergency response actions with respect to the safety of operations being conducted. The Health and Safety Officer will report directly to the Site Supervisor. Specific duties of the Health and Safety Officer are as follows:

- Conduct an initial assessment of the spill/release to identify chemical(s) and potential physical hazard(s) of the emergency response actions.
- Perform necessary air monitoring to determine levels of exposure and necessary protective equipment for emergency personnel and evaluate the potential for off-site migration of airborne contaminants.
- Present a safety briefing to on-site personnel to inform them of the actual and potential hazards of the emergency spill/release response and required levels of personnel protective equipment.
- Identify use of any engineering controls, (e.g., ventilation, remote handling devices, etc.), to control overexposure of personnel to hazardous substances.
- Identify work zones to be established by on-site personnel.
- Investigate any injuries or illnesses as a result of accidents occurring during the emergency response.
- Observe the safety of clean-up procedures and ensure appropriate PPE requirements are being adhered to.
- Determine that it is safe for personnel to return to the affected area after emergency response action are completed.

Maintain a log of safety briefings, air monitoring, safety observations, and other important issues relevant to safety.

4.3 On-Site Personnel

The Site Supervisor may be responsible for directing the on-site personnel in emergency response operations.

The on-site personnel will respond initially to all emergency incidents. Priorities of on-site personnel will be to protect human health and safety of on-site personnel and nearby residents, and then the environment. Concentration will be placed on preventing the spill/release from spreading to nearby areas. The spill/release response efforts will be carried out until, if necessary, arrival of the appropriate local emergency response authorities. Specific duties of the on-site personnel are as follows:

- Clear the area of all personnel not actually involved in responding to the spill/release, and remove any injured persons from the area such that medical treatment can be administered by qualified first-aid trained personnel. Prior to allowing treatment of injured persons by first-aid trained personnel, decontamination of the injured persons will be performed. On-site personnel will be responsible for ensuring that the level of decontamination reflects the extent of injury and level of contamination.
- Establish appropriate work zones for emergency response as directed by the Health and Safety Officer.

- Control the incident or release at the direction of the Site Supervisor, until, if necessary, outside emergency response help arrives.

The Site Supervisor may appoint or designate, as necessary, on-site personnel to assist in the following efforts:

- Notification of local emergency response authorities.
- Site evacuation and accounting of personnel and visitors.
- Assuring that personnel not involved in the emergency response and clean-up activities are kept a safe distance from the spill/release area and do not interfere with operations.
- Maintaining on-site traffic lanes for emergency response vehicles.
- Sampling efforts to determine the extent of contamination and clean-up efforts.
- Proper containerization, labeling and staging of any recovered hazardous materials.
- Assisting in decontaminating, recharging or replacing all emergency equipment used during the emergency response.
- Assisting in returning personnel to their work areas after the "all clear" signal is given.

5. Severe Weather Preparation

The Site Supervisor may administer four different preparation phases if severe weather including a tropical depression, tropical storm, or hurricane is anticipated to make landfall in the general vicinity of the work site based on the National Hurricane Center advisories. The phases and associated procedures are defined below and should be followed to protect the work site and personnel in the event of severe weather.

Phase I Preparation

Severe weather events, including heavy rains with potential localized flooding, or expected tropical depression, tropical storm, or hurricane landfall in the southeast Texas vicinity which is predicted to have up to 50 mph winds and will affect the Channelview Area within 96 hours. The Site Supervisor will execute the following:

- Monitor the weather forecast for updated hurricane predictions
- Consider suspending all non-essential work site activities and deliveries and covering of any open excavations
- List all work necessary to control loose materials/equipment from potential damage (water or wind)
- Verify that all supplies needed to secure the work site are available

Phase II Preparation

Expected tropical depression, tropical storm, or hurricane landfall in the southeast Texas vicinity which is predicted to have up to 50 mph winds and will affect the Channelview Area within 96 hours.

The Site Supervisor will execute the procedures outlined in Phase I and, in addition, will execute the following:

- Suspend all non-essential work
- Consider timing of a complete suspension of work and for covering of any open excavations
- Secure or remove equipment that could be damaged by the storm (i.e., small totes, drums, vehicles, monitoring instruments, etc.)

Phase III Preparation

Expected tropical depression, tropical storm, or hurricane landfall in the southeast Texas vicinity which is predicted to have up to 50 mph winds and will affect the Channelview Area within 84 hours. The Site Supervisor will follow the procedures outlined in Phases I and II and, in addition, will execute the following:

- Cancel all deliveries
- Suspend all work and shutdown and move equipment off-site, as necessary
- Take all records off-Site
- Backfill any open excavation using available on-site material or clean backfill.

Phase IV Preparation

Expected tropical depression, tropical storm, or hurricane landfall in the vicinity of southeast Texas which is predicted to affect the Channelview Area within 72 hours. The Site Supervisor will follow the procedures outlined in Phases I, II, and III and, in addition, will execute the following:

- Evacuate all personnel from the work site
- Suspend all work activities until the Site Supervisor, in coordination with the Project Manager and EPA RPM, determines the work site is safe for re-entry

5.1 High Water Plan

This section will discuss the plans and procedures to implement in preparation and during a high water event. The project team will monitor applicable weather and river stage predictions to forecast a high water event. Prior to an anticipated high water event, the project team will take the following precautions to secure the work site.

5.1.1 On-Shore Response

5.1.2 Off-Shore Response

5.2 Re-Entry Procedure

The Site Supervisor, in coordination with the Implementing Party, will determine the appropriate time for personnel to return to the Site. Site personnel will not access the work site until the Site Supervisor approves entry.

Federal, state, and local government agencies and law enforcement officials have agreed to recognize specific identification from critical infrastructure owners and operators, and their contractors, subcontractors, and assignees that seek access into a closed emergency area. Once identity has been verified, access is granted at the discretion of agency or official representatives (e.g., law enforcement, National Guard). The following is a list of identification that may be required to gain access at checkpoints:

1. A valid State Driver's License and company-issued photo ID
2. Transportation Worker Identification Credential (TWIC) Card
3. Marked company vehicles
4. Letter of Access (LOA) issued by the company (with verified phone number) stating that the person and vehicle is authorized

Once the local authorities have granted access, the Site Supervisor, in coordination with the Implementing Party, can then determine the appropriate time for personnel to return to the work site. Site personnel will not access the work site until the Site Supervisor approves entry.

5.3 Site Inspection

Once it is determined that the work site is safe to access, personnel will mobilize to the work site to complete a post-hurricane/post-high water event site inspection. Personnel will document work site conditions with photographs and field notes. In addition, they will note any damage or impact to materials or equipment, determine approximate high water levels, and/or obtain relevant information from any local residents that may have stayed in the area during the storm. If necessary, site personnel will prepare a Site Inspection Report for submittal to the EPA that includes documentation of the work site conditions and photographs.

6. Evacuation Route and Procedures

Emergencies require prompt and deliberate action. In the event of a hazardous material spill/release, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible; however, in specific emergency situations, the Site Supervisor may deviate from the procedures to provide a more effective plan for bringing the situation under control. The Site Supervisor is responsible for determining which situations require evacuation of the work site.

This section describes the procedures which will be employed to ensure on-site personnel and nearby residents are not exposed to hazardous conditions arising out of releases of hazardous materials. No single recommendation can be made for evacuation or safe distances due to the nature of the work. Safe distances can only be determined at the time of an emergency, based on a combination of work site and incident conditions. However, the following measures are established to serve as general guidelines. Table 1 below addresses the criteria for releases.

Table 2 Criteria for Hazardous Material Spill/Release Incidents

Release Classification	Criteria
Minor Release	• Low toxicity compound spill > 1 bbl outside secondary containment, or ≥ 5 bbl inside secondary containment, unless it impacts or potentially impacts state or marine waters • Single hand held detector with a LEL reading ≥ 50 percent • Smoke Investigation
Major Release	• High toxicity compound spill impacting or potentially impacting state or marine waters • Fire or Explosion • Hazardous materials release with off-site potential

6.1 Minor Releases Requiring Limited Evacuation

In the event of minor releases (small spills of low toxicity) of hazardous materials, personnel will evacuate the immediate area and report to the Contaminant Reduction Zone (CRZ). Low toxicity will be defined as a compound having an Animal LD_{50} greater than 50 milligrams/ kilograms (mg/kg). The signal to evacuate a limited area in the case of a minor release will be one short blast using an air horn or verbal communication. Small spills or leaks from a container will require initial evacuation of at least 35 feet in all directions to allow for clean-up and to prevent exposure.

After initial assessment of the extent of the release and potential hazards, the Site Supervisor, in consultation with the Health and Safety Officer, will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, or barricades will be used to secure the boundaries.

6.2 Major Release Requiring Evacuation of the Site

In the event of a major hazardous material release (large spills of high toxicity), personnel will be evacuated from the Site. High toxicity will be defined as a compound having an Animal LD_{50} less than 50 mg/kg. Three short blasts using an air horn will be used to notify on-site personnel to evacuate the work site in case of major releases requiring evacuation of the work site. Site evacuation will be initiated by the Site Supervisor, in consultation with the Project Manager and EPA RPM. However, if necessary, the Site Supervisor will initiate Site evacuation, as necessary, to protect the health and safety of on-site personnel.

6.3 Site Evacuation Route

The Site evacuation route will be identified daily during tailgate safety meetings (TGSM) due to changing work site conditions, work activities, and weather factors. A secondary evacuation route will also be identified during the TGSM.

6.4 Evacuation Procedures

In the event work site evacuation is necessary, the following actions will be undertaken:

- The signal for work site evacuation will be activated (three short blasts using an air horn).

- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the work site will cease to allow safe exit of personnel and movement of emergency equipment.
- **ALL** personnel, visitors, and contractors will immediately leave through the identified primary or secondary evacuation route.
- No persons will remain or re-enter the work site unless to carry out their emergency duty procedures. Those within the work site area will normally only include emergency response personnel or other emergency teams (e.g., fire department).
- Immediately upon exit, **ALL** personnel, visitors and contractors will be accounted for by the Site Supervisor or designee.
- The names of emergency response team members and/or other emergency team members involved in emergency response will be reported to the Site Supervisor.
- Re-entry into emergency areas, to find persons not accounted for will not be attempted.
- Re-entry into the work site will be made only after an "all clear" signal is given by the Site Supervisor. At his/her direction, a signal or other notification will be given for re-entry into the work site.

6.5 Places of Refuge

6.5.1 Alternate Places of Refuge

7. Emergency Site Security and Control

Implementation of security procedures will begin with the notification that an emergency has occurred. When it is necessary to evacuate personnel from the work site or an area within the work site, security measures will be implemented to safely remove personnel and to secure the area from re-entry. Emergency security is necessary to prevent the exposure of unprotected personnel to work site hazards and to avoid interference with emergency response actions. On-site personnel will immediately take steps to secure the spill/release area and establish safe boundaries (i.e., work zones). Three work zones will be established at the direction of the Health and Safety Officer. The three zones are defined as follows:

- Support Zone (SZ) - The uncontaminated area where emergency response personnel should not be exposed to hazardous conditions.
- Contaminant-Reduction Zone (CRZ) - The area where decontamination takes place.
- Exclusion Zone (EZ) - The contaminated area/emergency response area.

7.1 Delineation of Work Zones

Delineation of these three zones will be based on sampling and monitoring results, pre-determined area that will be excavated and on an evaluation of potential routes and amount of contamination dispersion in the event of a release. Movement of personnel and equipment among these zones will be minimized and restricted to access control points to prevent cross contamination from contaminated areas to clean areas. Work zones will be clearly marked by lines, placards, hazard tape, construction cones and/or signs, or enclosed by physical barriers such as fences, or ropes.

7.2 Buddy System

The use of a buddy system will be implemented where activities are performed in the EZ. The buddy will be able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical exposure or heat stress.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the Site Supervisor or others, if emergency help is needed.

The buddy system alone may not be sufficient to ensure that help will be provided in an emergency. Whenever possible, personnel in the EZ will be in line-of-sight contact or communications contact with the Site Supervisor or designee in the SZ.

7.3 Communication Systems

A system of communication, as described below, will be established at the hazardous material spill/release scene. The communication system will address both internal communication among on-site personnel and external communication between on-site and off-site personnel.

7.3.1 Internal Communication

Internal communication will be used to:

- Alert emergency response personnel members to emergencies.
- Pass along safety information, such as the next rest period, air change, heat-stress check, etc.
- Communicate changes in the work to be accomplished.
- Maintain control of the work site.

The Site Supervisor will be responsible for determining the proper methods of communication at the work site. The Site Supervisor will also be responsible for instructing all on-site personnel on the use of the selected communication methods.

7.3.2 External Communication

An external communication system between on-site and off-site personnel will be implemented to:

- Coordinate emergency response.
- Report to management.
- Maintain contact with essential off-Site personnel.
- The primary means of external communication will be by telephone.

8. Emergency First Aid and Medical Treatment

Any personnel requiring emergency medical attention will be evacuated immediately from EZs and CRZs. Personnel will not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant. If decontamination does not interfere with essential treatment, it should be performed.

If decontamination can be performed, observe the following procedures:

- Wash external clothing and cut it away.

If decontamination cannot be performed, observe the following procedures:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel and emergency vehicles.
- Alert emergency (i.e., 911) and off-site medical personnel of potential contamination; advise them to implement decontamination procedures.
- Send work site personnel familiar with the incident and chemical safety information, (e.g., SDS).
- Transport victim to the medical facility along the predefined route.

8.1 Emergency Medical Actions

If actual or suspected serious injury occurs, these steps will be followed:

- Remove the exposed or injured person(s) from immediate danger.
- First aid to be rendered at on-site personnel discretion. Decontaminate affected personnel after critical first aid is given.
- Notify Site Supervisor and Health and Safety Officer of incident.
- Obtain emergency medical services or ambulance transport to the hospital.
- Other personnel in the work area will be evacuated to a safe distance until the Site Supervisor determines that it is safe for work to resume. If there is any doubt regarding the condition of the area, work shall not commence until all hazard-control issues are resolved.

8.2 First Aid

Qualified personnel may give first aid at their discretion and stabilize an individual needing assistance. Professional medical assistance will be obtained at the earliest possible opportunity.

To provide first-line assistance to emergency response personnel in the case of sickness or injury, the items identified in Section 8, will be made immediately available.

8.3 Emergency Numbers

In the event of an emergency medical incident the telephone numbers provided in Table 1 shall be available to summon for assistance.

9. Emergency Alerting and Response Procedures for On-Site Incidents

In the event of an emergency involving an on-site hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation.

9.1 Emergency Alerting Procedures

If on-site personnel discover a chemical spill or process upset resulting in a vapor or material release, they will immediately notify the Site Supervisor. When contacted, the Site Supervisor will obtain information pertaining to the following:

- The material spilled or released.
- Location of the release or spillage of hazardous material
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill/release or vapor or smoke release is heading.
- Any injuries involved.
- Fire explosion or chemical reaction or possibility of these events.
- The area and materials involved and the intensity of the fire or explosion.

This information will help the Site Supervisor to assess the magnitude and potential seriousness of the spill or release.

9.2 Emergency Response Procedures

The initial response to any emergency will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If a spill/release is not contained within a dike or sump area (e.g., drum staging area or decontamination pad), an area of isolation will be established around the spill/release. The size of the area will generally depend on the size of the spill/release and the materials involved. If the spill/release is large or is highly toxic, an initial isolation of at least 100 feet in all directions will be used. Small spills or leaks of low toxicity will require evacuation of at least 35 feet in all directions to allow clean-up and repair and to prevent exposure. When any spill/release occurs, only those personnel involved in overseeing or performing emergency operations will be allowed within the EZ or CRZ (see Section 7, Emergency Site Security and Control).

If the spill/release results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire or due to high vapor pressures under ambient conditions), further evacuation will be enforced. An area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled. This may be modified based on air monitoring performed by the Health and Safety Officer.

If the control and clean-up of a spill or release is within the capabilities of the on-site personnel, and it does not threaten human health or safety of on-site personnel or nearby residents, local emergency response authorities will not be notified, unless the release migrates beyond the perimeter of the work site. This decision will be made by the Site Supervisor in consultation with the Project Manager and EPA RPM, if practicable.

Any release occurring from drums or other containers containing solid wastes will be placed into approved containers and will be labeled as to its contents and transferred to the on-site staging area pending treatment and/or off-site disposal.

In the event of spilled liquid, the spilled liquids will be confined to the immediate area of the spill and the liquids will be pumped, with the use of a portable hand pump, into an overpack drum or tank (or similar container). The spilled liquids will be confined by diking around the spill with native material or with an inert absorbent. Any residual liquids which cannot be pumped will be absorbed with a sufficient quantity of inert absorbent to ensure that no free liquids remain. Containers which are generated will be labeled as to contents and transferred to the on-site drum staging area pending treatment and/or off-Site disposal. If the spilled liquid consisted of non-aqueous phase liquids (NAPL) or highly toxic waste, the spilled material and visibly affected soils will be immediately excavated, placed in drums and transferred to the staging area. If the spilled liquid consisted of decontamination water, the decision to excavate the visibly affected soils will be based on whether the water was generated from a source known to exhibit contamination.

If the Site Supervisor determines that the control and clean-up of a spill or release is not within the capabilities of the on-site personnel or the spill or release may threaten human health or safety of on-site personnel or nearby residents or may potentially migrate beyond the work site perimeter, the 911 dispatcher will be immediately notified. Evacuation of all potentially affected work site areas will be initiated by the Site Supervisor. Evacuation of potentially affected nearby residents will be initiated by the proper local emergency response authorities, as soon as possible.

10. Personal Protection and Emergency Equipment

10.1 Personal Protective Equipment

Emergency response personnel entering an EZ for emergency spill/release response will, depending on the task and exposure potential, wear one of the protection levels as described in the HASP as directed by the Health and Safety Officer.

10.2 Emergency Equipment

The following emergency equipment will be available for deployment during emergencies/releases of hazardous materials if needed.

10.2.1 Air Monitoring Equipment

The following equipment list includes direct reading instrumentation that may be used in emergency situations to assess the degree of environmental hazard. This equipment will only be used by the

Safety and Health Office, Site Supervisor, or other specially trained designees. This equipment will be stored, charged and ready, for immediate use in evaluating hazardous chemical concentrations.

Equipment Name	Application
Photoionization detector (PID) with an 11.7 eV lamp.	Measures total undifferentiated organic chemical concentrations.
Real-Time Digital Particulate Monitor such as a MIE DataRAM.	Measures particulate levels.

10.2.2 Emergency Response Clean-Up Equipment

A sufficient supply of the following emergency response clean-up equipment will be inventoried and maintained at the work site for spill/release control:

- "Diatomite" or equivalent to solidify/absorb liquid spills.
- Sorbent sheets (diapers) to absorb liquid spills.
- Hand tools.
- Empty drums for containerizing recovered liquids and soils.

The bulk of the above materials will be staged in the SZ. Smaller quantities will be staged, as necessary, in each active work area in the EZ during activities.

10.2.3 Emergency Safety Equipment

The following equipment will be staged at the Site, during active RA activities, to provide for safety and first aid:

- Air horn.
- Additional PPE equipment.
- Potable water.
- OSHA approved first aid kit sized for a minimum of ten people.
- Portable emergency eyewash/shower.
- 20-pound ABC type dry chemical fire extinguishers (one per each piece of heavy equipment).

11. Response Follow-Up

Following all emergency response actions and activation of this plan, the Site Supervisor will conduct a debriefing session for all key individuals involved. The response will be evaluated and response plans revised, if necessary. Corrective actions will be listed where procedures were inadequate or need improvement. Responsible persons will be listed and held accountable for follow-up. The Site Supervisor will prepare an incident report, fully documenting any release of hazardous material, at or above reportable quantities, and response actions taken.

Attachment 3
Field Sampling Plan

Attachment 3 - Field Sampling Plan - Southern Impoundment

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Harris County, Texas

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1. Introduction

This Field Sampling Plan (FSP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). This Field Sampling Plan (FSP) will be completed in accordance with Sampling and Analysis Plan Guidance and Template, Version 4, General Projects R9QA/009.1 May 2014 United States Environmental Protection Agency (EPA). Preparation of this FSP may include planning discussions with EPA, Texas Commission of Environmental Quality (TCEQ), United States Coast Guard (USCG), U.S. Army Corps of Engineers (USACE), and other responsible agencies and stakeholders. References in this FSP to the “work site” are to the Southern Impoundment.

2. Sampling Objectives and Rationale

The FSP defines in detail the sampling methods to be performed to obtain the data in connection with implementation of the RA for the Southern Impoundment. It provides the operational plan for execution of the sample design and identifies the procedures for collection of samples consistent with the sample design (EPA, 1993a). The FSP is supplemented by the QAPP to verify that the data will be usable for that purpose.

This section will describe the purpose of the environmental investigation and how the data will be used. It will discuss how the work site’s history relates to the problem to be investigated, the scope of the sampling effort, and the types of analyses required. It may include all measurements to be made on an analyte-specific basis in whatever media (soil, sediment, water, etc.) are to be sampled.

3. Sample Type, Frequency, and Locations

Environmental media samples may be collected for a variety of purposes during implementation of the Southern Impoundment RA. The type, location, and frequency of environmental media samples collected are dependent on the intended use of the data. The determination of the appropriate number of samples to be collected is made with a number of considerations including the number of areas of concern that will be sampled, planned statistical methods, statistical performance, and practical considerations of logistics and cost (EPA, 1989).

3.1 Soil and Sediment Sampling Rationale

This section will provide a general overview of the soil and sediment sampling during for the RA, if necessary. It will present a rationale for choosing each sampling location at the work site or sampling area and the depths at which the samples are to be taken, if relevant. If decisions will be made in the field, details concerning the criteria to be used to make these decisions will be provided. A figure showing proposed sampling locations will be provided.

3.2 Contact Water Sampling Rationale

This section will provide a general overview of the contact water sampling rationale for the RA, if necessary. It will present a rationale for choosing the sampling location. If decisions will be made in the field, it will provide details concerning the criteria to be used to make these decisions. This section will list the analytes of concern at each location and provide a rationale as to why the specific chemical or group of chemicals was chosen. Section will include a figure showing sampling locations.

4. Sample Equipment and Procedures

4.1 List of Equipment Needed

This section will list all the equipment to be used in the field to collect samples, including decontamination equipment, if required. It will also discuss the availability of back-up equipment and spare parts. This information can be presented in a table.

4.2 Calibration of Sampling Equipment

This section will describe the procedures by which field equipment is prepared for sampling, including calibration standards used, frequency of calibration and maintenance routines. It will also indicate where the equipment maintenance and calibration record(s) for the project will be kept.

5. Investigation Derived Wastes

This section will describe the type(s) of investigation-derived wastes (IDW) that will be generated during any sampling event. Depending upon site-specific conditions and applicable federal, state, and local regulations, other provisions for IDW disposal may be required. Any analyses of IDW will be discussed, if required. This section will also discuss drum labeling procedures for IDW that is placed in drums. The procedures that should be followed for handling the IDW will also be discussed. The procedures will have enough flexibility to allow the sampling team to use its professional judgment as to the proper method for the disposal of each type of IDW generated at each sampling location.

Attachment 4
Quality Assurance Project Plan

Attachment 4 - Quality Assurance Project Plan - Southern Impoundment

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Harris County, Texas

International Paper Company

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1. Introduction

This Quality Assurance Project Plan (QAPP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). The QAPP was developed to augment the Field Sampling Plan (FSP) and to address sample analysis and data handling during implementation of the remedial action (RA) for the Southern Impoundment. The QAPP was prepared in accordance with the *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01003 (March 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (December 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (March 2005).

In accordance with the EPA guidance listed above, there are four main topics that must be included in a QAPP.

Those four topics are:

- Project Management - project management, project objectives, and project history.
- Data Generation and Acquisition - descriptions of the design and implementation of all measurement systems that will be used during the project.
- Assessment/Oversight - the procedures used to ensure proper implementation of the QAPP.
- Data Validation and Usability - the quality assurance (QA) activities that occur after the data collection phase of the project is completed.

The associated tasks and responsibilities with project management, data generation and acquisition, assessment/oversight, and data validation and usability will be presented in the QAPP.

2. Project Management

2.1 Project Organization

This section will list the responsibilities of management, QA personnel, field personnel, and laboratory personnel. Additionally, any special training/certification requirements for Implementation of the Southern Impoundment RA will be identified and an organization chart that identifies the lines of communication among the participants may be presented herein.

2.2 Background

This section will contain relevant Site history and background information.

2.3 Remedial Action Activities

This section will provide an overview of the remedial activities to be conducted as part of the RA for the Southern Impoundment.

2.3.1 Site Preparation

2.3.2 Bulkhead Construction

2.3.3 Excavation

2.3.4 Loading/Transpiration and Disposal

2.3.5 Water Treatment and Discharge

2.3.6 Backfill and Site Restoration

2.4 Quality Objectives and Criteria

Data quality objectives (DQOs) are qualitative and quantitative statements derived from the outputs of each step of the DQO process. The DQO process is a series of planning steps based on the scientific method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application. A systematic planning process will be used to develop DQOs for purposes of this work plan. That process, as described in EPA's Guidance on Systematic Planning Using the DQOs Process (EPA, 2006), is designed to ensure that environmental data are of the appropriate type and quality for the intended use, and lead to logical conclusions and defensible decisions or estimates. DQOs are developed through a seven-step process that is both sequential and iterative, depending upon the complexity of the problem. The steps involve both qualitative and quantitative criteria. The overarching outcomes of the DQO process are described below.

There are seven steps in the DQO process that include:

1. Stating the problem
2. Identifying the goal of the study
3. Identifying information inputs
4. Defining the boundaries of the study
5. Developing the analytical approach
6. Specifying performance or acceptance criteria
7. Developing the plan for obtaining data

2.5 Special Training Requirements/Certifications

This seciton will outline the training and certification requirements for the Site.

2.6 Documentation and Records

The documents, records, and reports generated during the remedial activities will be identified in the following subsections.

3. Data Generation and Acquisition

The design and implementation of the measurement systems that will be used during implementation of the Southern Impoundment RA, which may include sampling procedures, analytical procedures, and data handling and documentation, will be described in this section.

3.1 Sampling Design

This section will set forth t the rationale for the sampling program.

3.2 Measurement, Testing, and Sampling Methods

3.3 Sample Handling and Custody

This section will outline the procedures that may be used to collect potential samples.

3.3.1 Sampling Equipment Decontamination

3.3.2 Sample Packaging

3.3.3 Chain-of-Custody Control

This section will discuss how chain-of-custody is the sequence of possession of an item. An item (such as a sample or final evidence file) is considered to be in custody if the item is in actual possession of a person, the item is in the view of the person after being in his/her actual possession, or the item was in a person's physical possession but was placed in a secure area by that person. Field, laboratory, and final evidence files custody procedures may be described in the subsections that follow.

3.3.4 Sample Shipment

3.4 Laboratory Analytical Methods

This section will list the laboratory analytical methods that will be used. This section may also state the turnaround time required for the analyses required for each batch of samples.

3.5 Quality Control Requirements

The field and laboratory QC requirements will be discussed in the following subsections. Specific QC checks and acceptance criteria may be provided.

3.5.1 Field QC Elements

3.5.2 Analytical Laboratory QC Elements

3.6 Instrument/Equipment Testing, Inspection, and Maintenance

The procedures to be used to verify that instruments and equipment are functional and properly maintained may be described in the following subsections.

3.6.1 Field Equipment

3.6.2 Laboratory Equipment

3.7 Instrument Calibration and Frequency

3.7.1 Calibration of Field Instrumentation

3.7.2 Calibration of Laboratory Instrumentation

3.7.3 Calibration of Laboratory Equipment

3.8 Inspection/Acceptance of Materials

The procedures that will be used to ensure that supplies and consumables used in the field and laboratory will be available as needed and free of contaminants are detailed in the following subsections.

3.8.1 Field Supplies and Consumables

3.8.2 Analytical Laboratory Supplies and Consumables

3.9 Data Management

The procedures for managing data from generation to final use and storage will be stated in this section.

4. Assessment and Oversight

The following subsections will describe the procedures used to ensure proper implementation of this QAPP and the activities for assessing the effectiveness of the implementation of the Southern Impoundment RA and associated QA/QC activities.

4.1 Assessments and Response Actions

Assessments consisting of internal and external audits may be performed during implementationi fo the Southern Impoundment RA. This section will describe internal technical system audits of both field and laboratory procedures that may be conducted to verify that sampling and analysis are being performed in accordance with the procedures established in the work plan and QAPP.

4.1.1 Field Audits

4.1.2 Laboratory Audits

4.1.3 Required Initial System Audit by QAO

4.1.4 Addressing Audit Deficiencies

4.2 Reports to Management

This section will describe quality assurance information may be summarized following completion of the remedial activities. This information may consist of the results of external PEs, results of periodic data quality validation and assessment, data use limitations, and any significant QA problems identified and corrective actions taken.

5. Data Validation and Usability

The QA activities that will be performed to ensure that the data are scientifically defensible, properly documented, of known quality, and meet the project objectives will be described in the following sections.

5.1 Data Review, Verification, and Validation

All field and laboratory data will be reviewed, verified, and validated. These terms are defined as follows:

- Data review is the in-house examination to ensure that the data have been recorded, transmitted, and processed correctly
- Data verification is the process for evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications
- Data validation is an analyte and sample-specific process that extends the evaluation of data beyond method, procedure, or contractual compliance (i.e., data verification) to determine the quality of a specific data set relative to the end use.

5.1.1 Sample Collection Procedures

5.1.2 Sample Handling

5.1.3 Analytical Procedures

5.2 Validation and Verification Methods

Field data will be verified by reviewing field documentation and chain-of-custody records. Data from direct-reading field instruments will be verified by reviewing calibration and operating records and QC data.

Verification of sample collection procedures consists of reviewing sample collection documentation for compliance with the requirements of the work plan and QAPP. If alternate sampling procedures were used, the acceptability of the procedure will be evaluated to determine the effect on the usability of the data.

5.3 Usability/Reconciliation with Data Quality Objectives

The overall usability of the data from the remedial activities will be assessed by evaluating the Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity (PARCCS) of the data set to the measurement performance criteria of this QAPP using basic statistical quantities, as applicable. The procedures and statistical formulas to be used for these evaluations may be presented in the following subsections.

5.3.1 Reconciliation with Method-Specific Acceptance or Performance Criteria

5.3.2 Reconciliation with Project Objectives

Attachment 5
Site Wide Monitoring Plan

Attachment 5 - Site Wide Monitoring Plan - Southern Impoundment

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Attachment Index

1. Introduction

1.1 Background

This Site Wide Monitoring Plan (SWMP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). This SWMP details the elements of the work related to the performance of all construction activities during the excavation of impacted materials from the Southern Impoundment. The SWMP summarizes the monitoring approach during and after construction, the environmental media being handled and monitored, data collection procedures, and documentation of monitoring activities.

1.2 Purpose

1.3 Relationship to Supporting Plans

2. Site Wide Monitoring Approach

This section identifies the monitoring approach to be implemented both during construction and post-construction monitoring, if necessary.

2.1 PDI Summary

2.2 Monitoring During Construction

The contractor will be required to prepare and submit a detailed Excavation Plan demonstrating compliance with specified requirements of the project specifications and to permit an engineer providing oversight of the excavation work (oversight engineer) to schedule testing and measurement activities.

During construction, monitoring of soils removal activities will include delineation of Impacted and non-impacted soil boundaries as each interval of soil is removed to ensure that no impacted soils remain at the work site (either in the ground within the delineated limits or mixed with non-impacted soils that are stockpiled for re-use as clean backfill). As each interval is removed, surveying will be performed to verify the extent of soils removal (both vertical and horizontal) and to clearly mark the boundaries of soils removal for the subsequent interval.

Other associated monitoring activities performed in relation to the soils excavation are addressed in the Field Sampling Plan, Quality Assurance Project Plan, Construction Quality Assurance/Quality Control Plan, and Transportation and Off-Site Disposal Plan. Details related to these associated activities are discussed in these separate plans.

Soils excavation and loading activities must be performed in a controlled manner in order to eliminate or significantly reduce the potential for generation and release of dusts and particulates from the work site. The contractor will be required to prepare and implement a Perimeter Ambient Air Quality Monitoring Plan, or similar, and potentially cease operations when air quality data approaches or exceeds the criteria established by that plan. Work can only recommence once steps required by the plan with respect to work site operations have been implemented.

Stormwater control is an essential part of the excavation program, both with regards to runon and runoff during rain events. Stormwater will be prevented from entering any open excavation in order to reduce the volume of water requiring treatment and to prevent sloughing of the excavation faces. Also, during large rain events that might overwhelm any excavations in progress, the contractor will be required to take steps so that accumulating stormwater is contained within the excavation (including pumping as necessary).

2.3 Post-Construction Confirmation

Upon completing each excavation area, backfilling will be performed in similar intervals. Compaction will be performed using the appropriate construction equipment in accordance with the requirements of the project specifications.

Upon completion of backfilling, surveying or other means will be performed to confirm that fill placement was completed to the previous elevations (prior to excavation). Grading of the final surface will be performed to ensure that surface water drains away from the backfilled areas (i.e., no ponding).

3. Environmental Media

This section describes the regulatory framework (criteria) for documenting that the delineated soils were appropriately removed, air monitoring was properly conducted to ensure dust and particulates were not allowed to disperse, and stormwater drainage was controlled.

3.1 Soils

3.2 Dust and Particulates

3.3 Stormwater Discharge

4. Data Collection Procedures

This section describes the procedures for collecting data during construction to fully document that the delineated contaminated soils were removed. Data associated with air monitoring for dust and particulate control will be recorded for background and throughout excavation activities. Maintenance of stormwater controls will be documented for the duration of the project.

4.1 Removal Performance Standards

4.1.1 Depth Weighted Average Approach

4.1.2 Confirmation Procedures

During excavation of both impacted and non-impacted soils, ground surveying may be performed both prior to each lift and upon completion of that lift, or a similar benchmark. Prior to each lift, the surveyor may mark the extent of impacted soils to be removed for the next interval. In addition, the full extent of each excavation bench, or similar means, will be delineated to ensure that impacted soils at deeper intervals are accessible.

4.1.2.1 Depth Control During Construction

4.1.2.2 Post Removal Surveying

4.2 Dust and Particulate Monitoring

This section will specify and discuss any dust and particulate monitoring required.

4.2.1 Sampling Instruments and Procedures

4.2.2 Sample Design and Frequency

4.2.3 Parameters and Methods

4.3 Stormwater

This section will specify and discuss any stormwater monitoring required.

4.3.1 Permit Sampling Requirements

4.3.2 Sampling Procedures

4.3.3 Analytical Methods

4.4 Responses to Changed Conditions

5. Documentation

This section identifies the performance standards for each of the environmental media of concern. Survey records will be required to be properly maintained and provided to the oversight engineer to fully document that all of the delineated impacted soils have been removed. Dust and particulate monitoring records and all notes regarding the maintenance of stormwater controls will also be required to be provided to the oversight engineer.

5.1 Removal Performance Standards

5.1.1 Depth Weighted Average Approach

5.1.2 Post-Removal Surveys

5.2 Dust and Particulate Monitoring

5.2.1 Daily Monitoring Records

5.2.2 Sample Calibration Records

5.3 Stormwater

5.3.1 Water Treatment Operation Reports

5.3.2 Water Discharge Monitoring Reports

5.4 Reports To The United States Environmental Protection Agency (EPA) and Teas Commission on Environmental Quality (TCEQ)

This section outlines the reports to be provided to the appropriate regulatory agencies. Throughout the construction project, the party for implementing the work will manage all reports provided by the contractor. The r party responsible for implementing the work will ensure the validity of these records by reviewing them in timely manner and requesting any corrections be made by the contractor as determined from the reviews. As the monitoring records are confirmed for accuracy and finalized, the party implementing the work will consolidate those records for regular reporting to the appropriate agencies, potentially the EPA and TCEQ.

5.4.1 Monthly Reports

5.4.2 Annual Reports

Attachment 6
Construction Quality Assurance/Quality Control Plan

Attachment 6 - Construction Quality Assurance/Quality Control Plan - Southern Impoundment

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1. Introduction

This Construction Quality Assurance/Quality Control Plan (CQA/CQP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). This CQA/CQP describes the planned and systemic activities that will be used to verify that the remedial construction satisfies the requirements contained in the Remedial Design (RD) for the Southern Impoundment. The CQA/CQP address the following major elements of the construction. References in this CQA/CQP to the "work site" are a reference to the Southern Impoundment.

- Construction Support Facilities and Site Control
- Bulkhead Construction
- Excavation
- Backfill and Site Restoration
- Water Treatment

The remainder of this section describes the project background, the purpose of the CQA/CQP and how this plan relates to the other supporting plans.

1.1 Background

1.2 Purpose

1.3 Relationship to Supporting Plans

2. Project Organization

The responsibility and lines of authority and communications will be described in this section. Each organization involved in construction activities related to the remedial action (RA) for the Southern Impoundment is identified, followed by a description of the roles and responsibilities of the organization and the roles and responsibilities of key individuals within each organization. These individuals are to be identified either identified by name or title. This section will also identify the lines of authority and the flow of information within CQA/QC Team.

2.1 Construction Quality Assurance and Quality Control Organization

2.2 Roles and Responsibilities of the Organizations

2.3 Roles and Responsibilities of Key Personnel

3. Submittals

This section will describe procedures for submittals and the submittal approval process. It will include, the types of submittals, management of the submittal register and the process for approval by the engineer responsible for the implementation of the RA for the Southern Impoundment (oversight engineer).

3.1 Types of Submittals

3.2 Submittal Register

3.3 Engineer's Review

4. Construction Support Facilities and Site Control

This section will describe the QA/QC procedures for setup of the facilities at the work site and work site controls. The major items to be adessed are the imported materials that are brought to the work site for site preparation, stormwater controls, and a survey of the work site. The material specification requirements and the requirements for verifying that the work has been performed according to the specifications will also be identified.

4.1 Material Specification Verification

4.1.1 Imported Materials

4.1.2 Stormwater Controls

4.1.3 Site Survey

4.2 Construction and Installation Monitoring

4.2.1 Imported Materials

4.2.2 Stormwater Controls

4.2.3 Site Survey

5. Bulkhead Construction

This section will describe the QA/QC procedures for construction of the sheet pile bulkhead. It will identify the inspection and verification procedures to be implemented to show that the piles and installation equipment brought to the work site conform to the specifications. It will also identify the procedures for monitoring the pile installation to confirm that the installation conforms with the drawings and the specifications.

5.1 Material Specification/Equipment Verification

5.1.1 Pile Material Verification

5.1.2 Installation Equipment Inspection/Verification

5.2 Construction and Installation Monitoring

5.2.1 Installation Procedure Verification

5.2.2 Alignment Survey and Verification

5.2.3 Depth Verification

6. Excavation

This section will describe the QA/QC procedures for excavation. The sections will identify the procedures for documenting that the excavation equipment and any additives used for mixing with the excavated material conform to the specifications. It will also provide the inspection procedures for tracking the progress of the work, testing material to be transported off-site for free liquids prior to its transportation, and inspecting trucks during loading, and the procedures governing confirmation surveying.

6.1 Material Specification/Equipment Verification

6.1.1 Equipment Inspection/Verification

6.1.2 Solidification Additive

6.2 Construction Monitoring

6.2.1 Production/Depth Monitoring During Construction

6.2.2 Paint Filter Testing

6.2.3 Inspection of Trucks

6.2.4 Confirmation Surveying

7. Backfill and Site Restoration

This section will describe the QA/QC procedures for backfill and site restoration. This section will identify the procedures for verifying and documenting that the material brought onsite conforms to the specifications for that material. It will also describe the procedures and criteria for inspecting and testing the material during placement.

7.1 Equipment and Material Specification Verification

7.1.1 Borrow Material

7.1.1.1 Geotechnical Testing

7.1.1.2 Chemical Testing

7.1.2 Rock Material

7.1.3 Geosynthetics

7.1.4 Seed

7.1.5 Equipment Inspection /Verification

7.2 Construction Monitoring

7.2.1 Inspection of Imported material

7.2.2 Placement Inspection

7.2.3 Moisture Density Testing

7.2.4 Geosynthetics and Rock Placement Inspection and Verification

7.2.5 Vegetation Placement Inspection and Verification

8. Water Treatment

This section will describe the procedures for verifying and documenting that the water treatment system conforms to the specifications. It will provide the procedures to verify and document that the equipment components meet specifications, the monitoring and testing procedures during installation and to document that the system is operating according to specifications.

8.1 Equipment and Material Specification Verification

8.2 Installation Monitoring

8.2.1 Subbase Preparation Inspection/Testing

8.2.2 Installation Inspection/Verification

8.2.3 Leak Testing

8.2.4 Process Safety Procedure Implementation

8.3 Operation and Compliance Monitoring

8.3.1 Water Treatment System Instrumentation Monitoring

8.3.2 Effluent Discharge Monitoring

8.3.3 Treatment Media Replacement and Disposal Monitoring

9. Tracking Nonconformance Procedures

This section provides the procedures for identifying and tracking QA/QC nonconformance issues. It identifies the types of noncnformance, the actions to be taken and a reporting matrix.

9.1 Identification of Nonconformance

9.2 Nonconformance Action/Reporting Matrix

9.3 Nonconformance Reports to Management

10. Meetings and Documentation

This section describes the required project meeting, the objectives of these meeting and the required attendees. It also describes the required QA/QC documentation on the project.

10.1 Project Meetings

10.1.1 Pre-Construction

10.1.2 Weekly

10.1.3 Daily

10.2 Documentation

10.2.1 Daily Recordkeeping

10.2.2 Transportation and Disposal Records

10.2.3 Daily Production Reports

10.2.4 Confirmation Survey Records

10.2.5 Water Treatment Operation Reports

10.2.6 Water Discharge Reports

10.2.7 Record Drawings

10.2.8 Records Retention

10.2.9 Documentation of Field Changes

11. References

Attachment 7
Transportation and Off-Site Disposal Plan

Attachment 7 - Transportation and Off-Site Disposal Plan - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

GHD | 5551 Corporate Boulevard Suite 200 Baton Rouge Louisiana 70808 USA
11187072 **|** Report No 12

Table of Contents

Figure Index

Attachment Index

1. Introduction

This Transportation and Off-Site Disposal Plan (TODP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). References in this TODP to the "work site" are to the Southern Impoundment.

1.1 Background

This TODP details the elements of the work related to the characterization, transportation and off-site disposal of removed soil from the Southern Impoundment and other wastes generated during implementation of the remedial action (RA) for the Southern Impoundment. The TODP summarizes the regulatory requirements, characterization results, disposal facility profiling requirements, on-site management and loading, transportation plans, and record keeping.

1.2 Purpose

1.3 Relationship to Supporting Plans

2. Roles and Responsibilities

This section will identify the roles and responsibilities as it relates to transportation and disposal activities for the different organizations involved in the implementation of the Southern Impoundment RA and the titles of key individuals and their responsibilities.

3. Regulatory Framework

This section will describe the regulatory framework for classification and disposal of removed soil and any other waste streams. With respect to the removed soil, it will provide a summary of the previous waste classification from the pre-design investigations, and the rationale for the classification of those wastes as it relates to the Southern Impoundment soils that will be generated during implementation of the Southern Impoundment RA.

This sections will also provide the requirements of EPA's Off-Site Rule (40 Code of Federal Regulations [CFR] 300.440) and indicate how it is being addressed and documented for each of the off-site disposal facilities that are planned for the project.

3.1 Summary of Previous Waste Characterization and Waste Profiling

3.2 Compliance with Off-Site Disposal Rule

4. Waste Classification Procedures

This section will describe the procedures for classifying the soil and any other wastes during implementation of the Southern Impoundment RA. It will list the different waste types and categories and the disposal options. It will also detail the procedures that will be followed for waste characterization sampling and analysis of the various waste streams.

4.1 Waste Stream Categories and Disposal Options

4.2 Waste Sampling and Classification

5. Waste Disposal Facilities

This section will list the waste disposal facilities that have been identified to accept waste from the Southern Impoundment RA and the types of waste that each facility can accept.

6. On-Site Management and Loading

This section will describe the procedures for onsite management of the waste, including the requirements and procedures for loading and securing the loads and control/mitigation of tracking any waste beyond the loading area and the work site.

6.1 Transportation Truck/Container Requirements

6.2 Truck Staging and Loading Requirements

6.2.1 Lining Trucks and Securing Loads

6.2.2 Control and Mitigation of Tracking Waste Beyond Work Areas

7. Transportation

This section will describe transportation requirements. It will provide maps showing the routes to the disposal facilities. The section will also describes the safety procedures that will be followed to control access and egress to the work site by vehicles, including signage and the use of flaggers.

7.1 Transportation Routes to Disposal Facilities

7.2 Site Entry and Egress Traffic Management

7.3 Management of Truck Congestion and Safety in Community

8. Document and Reporting

This section will provide the documentation requirements for the transportation and off-site disposal activities.

8.1 Waste Profiles

8.2 Manifests

8.3 Waste Reporting

Attachment 8
Institutional Controls Implementation and Assurance Plan

Attachment 8 - Institutional Controls Implementation and Assurance Plan - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

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Table of Contents

1. Introduction

This Institutional Control Implementation and Assurance Plan (ICIAP) is for the Southern Impoundment of the San Jacinto River Waste Pits Superfund Site in Harris County, Texas (Site) and was prepared by GHD Services Inc. (GHD), on behalf of the International Paper Company (IPC). This ICIAP will be completed in accordance with Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0- 89, EPA/540/R- 09/001 (United States Environmental Protection Agency [EPA] 2012a), Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (EPA 2012b), and as applicable, Texas Commission on Environmental Quality (TCEQ) guidance. Preparation of this ICIAP will include planning discussions with EPA, TCEQ, and other agencies and stakeholders responsible for administering the various types of institutional controls (ICs).

1.1 Plan Objectives

The overall objectives of the ICIAP are to:

- Identify ICs to meet requirements applicable to the Southern Impoundment contained in the Site's Record of Decision (ROD) and in the Statement of Work (SOW) that is part of the Administrative Settlement Agreement and Order on Consent for Remedial Design, Docket No. 06 02 18, with an effective date of April 11, 2018 (EPA, 2018a)
- Establish and document the activities and responsible entities to implement, maintain, enforce, terminate, and/or modify the ICs.

The specific requirements set forth in the SOW for the ICIAP include:

- ICs to protect the remedial action identified by EPA to be implemented by the appropriate entities. Locations of recorded real property interests and resource interests in real property that may affect ICs, including accurate mapping and geographic information system coordinates of such interests
- Legal descriptions and survey maps that are prepared according to current American Land Title Association Survey guidelines and certified by licensed surveyor

1.2 Plan Organization

This section will present the organizational structure of the ICIAP, listing the sections, and briefly describing the content contained in each section. This section will include a statement about the attached tables, figures, and appendices that support and supplement the content of the ICIAP.

2. Project Overview

2.1 Project Description and History

This section will include a brief description and history of the Southern Impoundment, consistent with the following information from select design documents and evaluations, such as:

- Site and river history
- Existing land, waterfront, and river conditions
- Existing ecological conditions
- Contaminants of concern and remediation goals
- Remedial action objectives for the Southern Impoundment
- Summary of the selected remedy for the Southern Impoundment
- Current and reasonably anticipated future uses within the Southern Impoundment

2.2 Remedy Extent and Institutional Controls Boundary

This section will summarize the engineering controls (ECs), IC boundaries, and other features. This discussion will include:

- Location of constituents of concern and associated IC boundaries
- Introduction of IC sub-boundaries (by property ownership and site access)
- Other relevant features

2.3 Key Stakeholders

This section will discuss property and ownership information, as well as identification of government entities and stakeholders.

This section will include discussion of the following:

- Ownership/occupancy information
- Leases, licenses, easements, and grants information
- Federal, state, and/or local government interests, if any
- Identity of other relevant stakeholders

This section will also discuss and provide property and resource mapping, legal descriptions, and survey maps as appendices as required by the SOW.

2.3.1 Property Interests

2.3.2 Resource Interests

2.4 Existing Institutional Controls (E.G., Zoning)

This section will summarize existing ICs and implementation of those ICs. Other existing regulations and guidance relevant to ICs will also be reviewed.

3. Planned Remedial Action Institutional Controls

This section will summarize the general elements for planned ICs based on the statement in the ROD that the following institutional controls may be implemented for the Southern Impoundment:

- “Deed restrictions are to be applied to parcels where dioxin concentration do not allow for unrestricted use and unlimited access”
- “Notices would be attached to deeds of affected properties to alert potential future purchasers of the presence of waste and soils with dioxin concentrations exceeding EPA’s protective level of 51 nanograms per kilogram (ng/kg) for residential exposures (unlimited use and unrestrictive [sic] access)“

3.1 Limits on Property Use

This section will discuss the potential mechanisms and tools to be employed to establish limits on property uses, including notices to be attached to deeds of affected properties.

3.2 Limits on Excavation and other Disturbances

This section will discuss the potential restrictions to be considered to inhibit unauthorized subterranean activity.

3.3 Legal Description and Survey Map

3.4 Notice to Deed

This section will discuss the use of deed notices or alternatives as proprietary controls. Proprietary controls are agreements that restrict use or specify controls but not property ownership.

4. Communications with Stakeholders

This section will discuss in more detail the communications and potential informational devices that may be used to communicate with stakeholders.

5. Monitoring/Enforcement

This section will address what, if any, IC monitoring will be necessary, including any administrative monitoring (e.g., land use changes, deed transfers, new tenants).

6. Reporting

This section will provide information regarding IC reporting, which will include:

- Reporting procedures
- Reporting frequency
- Events and activities to be reported
- Location and procedures for accessing records
- Entity responsible for reporting
- Stakeholder/regulatory entity contact

7. Summary

This summary may include a matrix that summarizes the ICs will be included as a Table and will provide a preliminary framework of that summary with potential actions and responsible entities.

8. References

EPA. 2012a. Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R- 09/001.

EPA. 2012b. Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02.

Attachment 9
Operation & Maintenance Manual

Attachment 9 - Operation and Maintenance Manual - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

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Per discussion with the United States Environmental Protection Agency (EPA), this plan is not anticipated to be necessary based on the Remedial Design (RD) of the selected remedy.

Attachment 10
Operation & Maintenance Plan

Attachment 10 - Operation and Maintenance Plan - Southern Impoundment

Draft Provided with Preliminary 30% Remedial Design - Southern Impoundment

San Jacinto River Waste Pits Site
Harris County, Texas

International Paper Company

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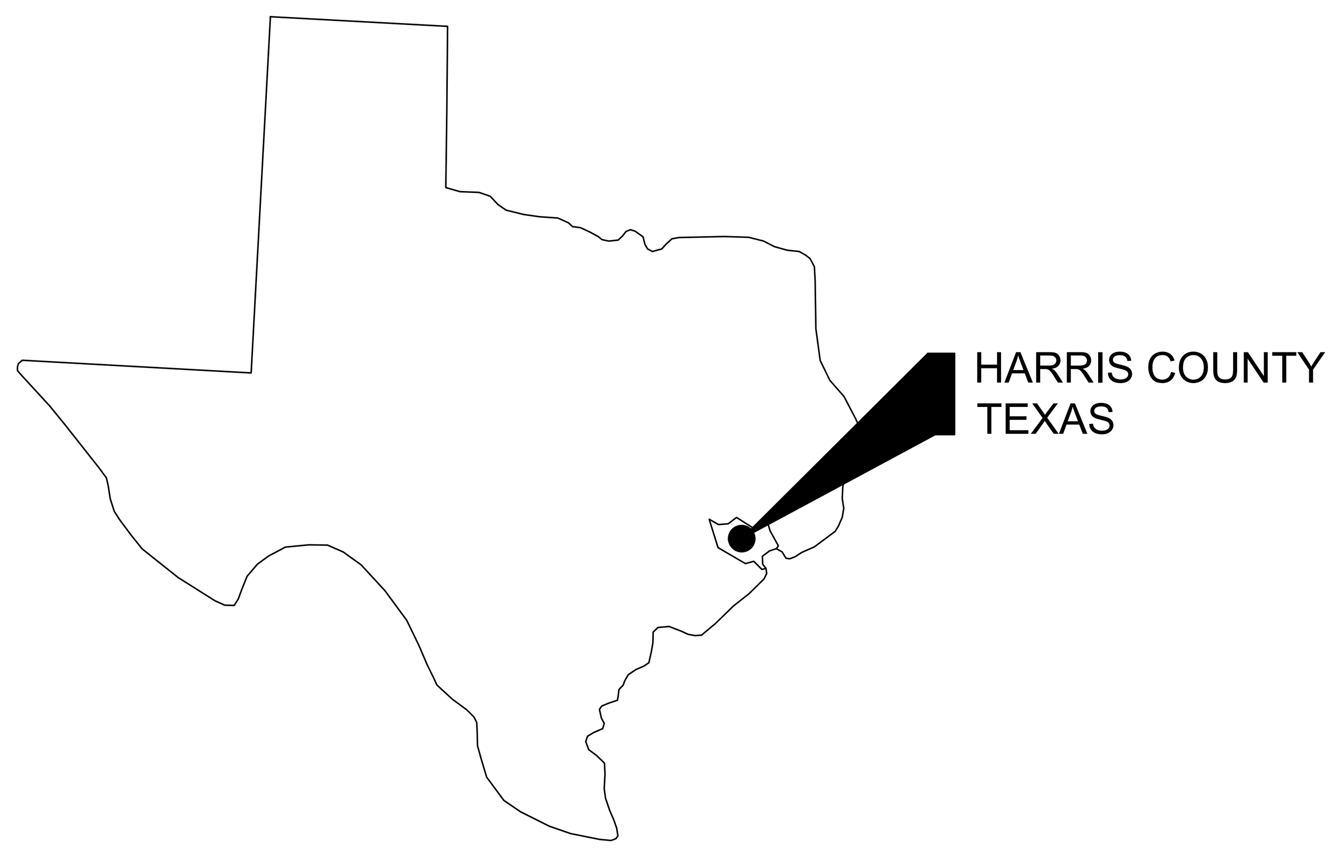
Per discussion with the United States Environmental Protection Agency (EPA), this plan is not anticipated to be necessary based on the Remedial Design (RD) of the selected remedy.

Appendix D
Design Drawing Package

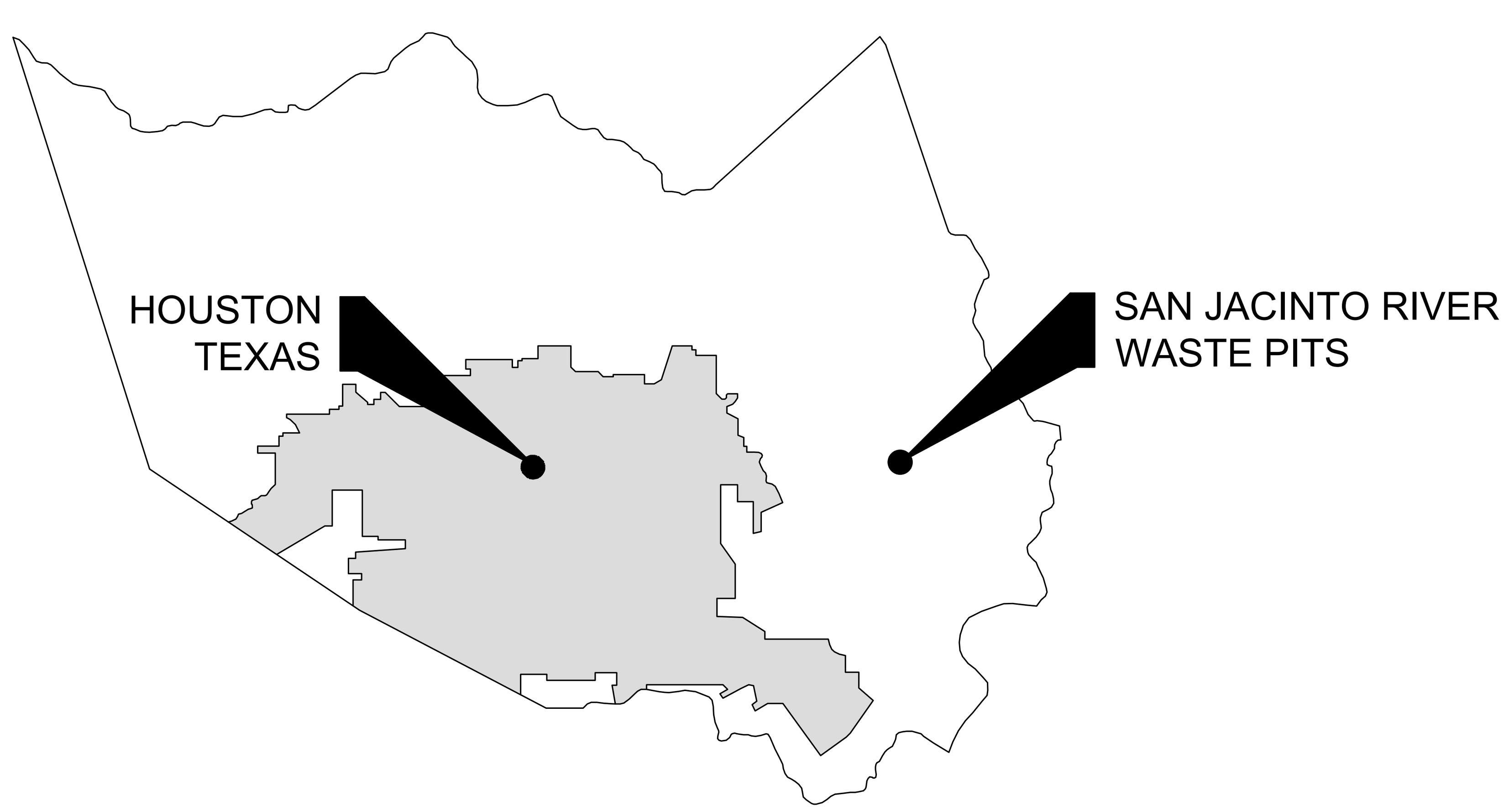
SAN JACINTO RIVER WASTE PITS
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

APRIL 2020

11187072-00(011)



STATE OF TEXAS VICINITY MAP



HARRIS COUNTY VICINITY MAP

LOCATION MAP

DRAWING NUMBER	DRAWING NAME
GENERAL SERIES	
G-01	COVER SHEET
CIVIL SERIES	
C-01	OVERALL SITE PLAN
C-02	EXISTING CONDITIONS
C-03	SITE WORKS
C-04	SOIL EROSION AND SEDIMENT CONTROL PLAN
C-05	SOIL EROSION AND SEDIMENT CONTROL DETAILS
C-06	PROJECT TRAFFIC CONTROL PLAN
C-07	EXCAVATION PLAN 1 OF 4
C-08	EXCAVATION PLAN 2 OF 4
C-09	EXCAVATION PLAN 3 OF 4
C-10	EXCAVATION PLAN 4 OF 4
C-11	EXCAVATION SECTIONS
C-12	SHEET PILE PLAN AND PROFILE
C-13	SHEET PILE DETAILS
C-14	TYPICAL DETAILS 1 OF 3
C-15	TYPICAL DETAILS 2 OF 3
C-16	TYPICAL DETAILS 3 OF 3
PROCESS FLOW AND INSTRUMENTATION SERIES	
P-01	WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM/MASS BALANCE
P-02	WATER TREATMENT SYSTEM P&ID (1 OF 2)
P-03	WATER TREATMENT SYSTEM P&ID (2 OF 2)
P-04	WATER TREATMENT SYSTEM SITE PLAN

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn **MW**	Designer **RH**
Drafting Check **BP**	Design Check **LL**
Project Coordinator **CM**	Date **Apr 9, 2020**
This document shall not be used for construction unless signed and sealed for construction.	Scale **N.T.S.**
Original Size **Arch D**	Bar is one inch on original size drawing 0 1"

Project No. **11187072**

Title
COVER SHEET

Sheet No.
G-01

Sheet - of -

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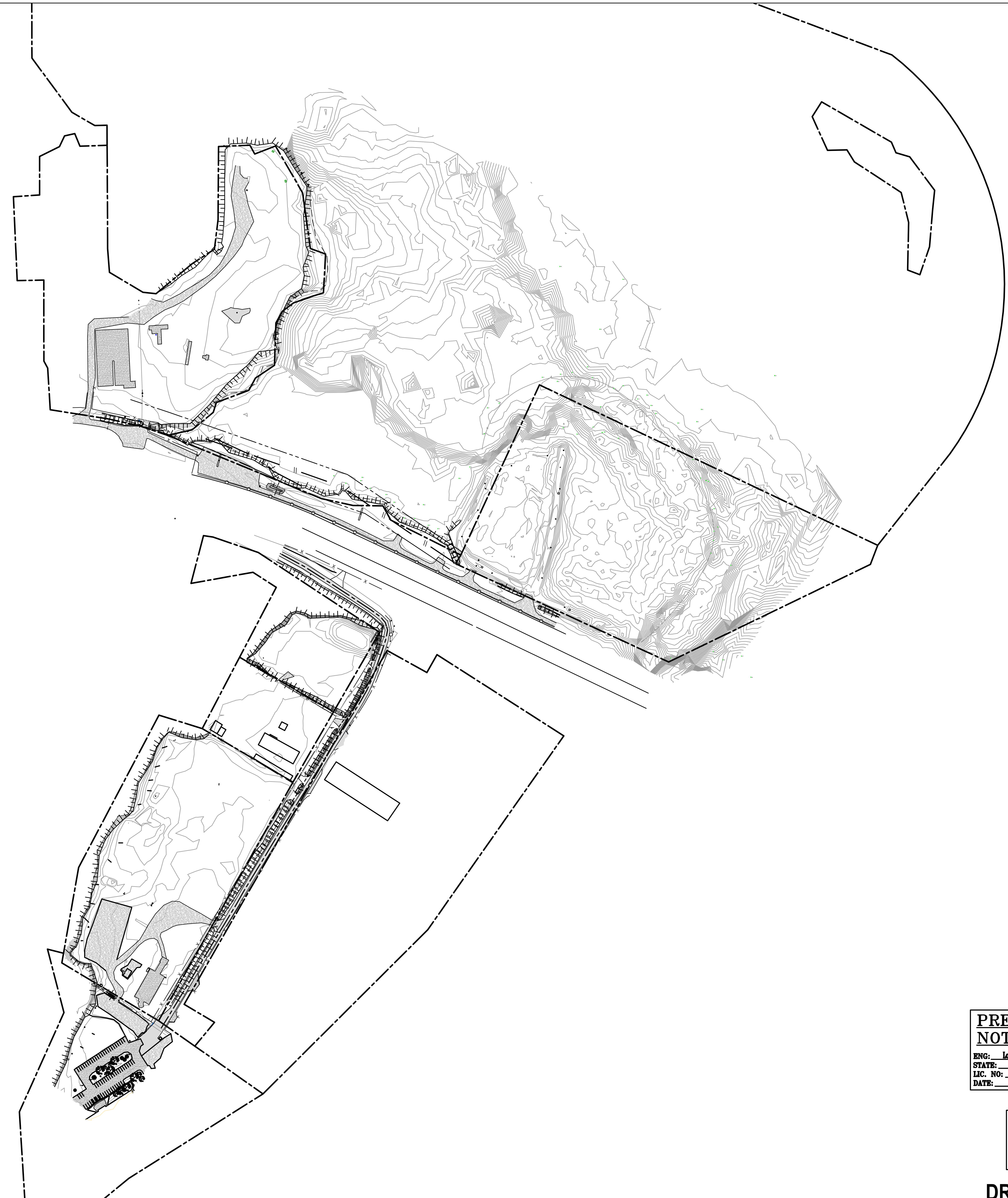

0 100 200 ft

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LEGEND

	PROPERTY BOUNDARY
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
	ROAD CENTERLINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	ASPHALT
	CONCRETE
	GRAVEL

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
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Project Coordinator	CM	Date	Apr 9, 2020
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Project No. 11187072

Title
OVERALL SITE PLAN

PRELIMINARY
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ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

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Sheet No.
C-01

Sheet - of -

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LEGEND

	PROPERTY BOUNDARY
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
	ROAD CENTERLINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	AREA OF CONTAMINATION
	ASPHALT
	CONCRETE
	GRAVEL

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NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
2. FOR THE AREAS REQUIRING SOIL REMOVAL ON THE SOUTHWEST PORTION OF THE SOUTHERN IMPOUNDMENT, A BULKHEAD WILL BE INSTALLED ADJACENT TO THE SAN JACINTO RIVER. THE EXCAVATION WILL BE COMPLETED UP TO THE LATERAL LIMIT OF THIS BULKHEAD.
3. A SURVEY WILL BE CONDUCTED TO CONFIRM THE BOUNDARIES OF THE MARKET STREET RIGHT-OF-WAY, GLENDALE BOAT WORKS PROPERTY, AND OTHER PROPERTIES NECESSARY TO IMPLEMENT THE DESIGN.

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ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
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Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
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Project No. 11187072

Title
EXISTING CONDITIONS

Sheet No.
C-02

Sheet - of -

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LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- ROAD CENTERLINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL

NOTE:
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STATE: TEXAS
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DATE: 4-13-2020

GHD SERVICES INC.
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Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
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1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
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Project No. 11187072

Title
SITE WORKS

Sheet No.
C-03

Sheet - of -

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LEGEND

- PROPERTY BOUNDARY
- 620 EXISTING CONTOUR INTERVAL
- X FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
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- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL
- SILT FENCE
- T TURBIDITY CURTAIN
- OIL BOOM

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client

SAN JACINTO RIVER WASTE PITS

Project

SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title

SOIL EROSION AND SEDIMENT CONTROL PLAN

Sheet No.

C-04

Sheet - of -

NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

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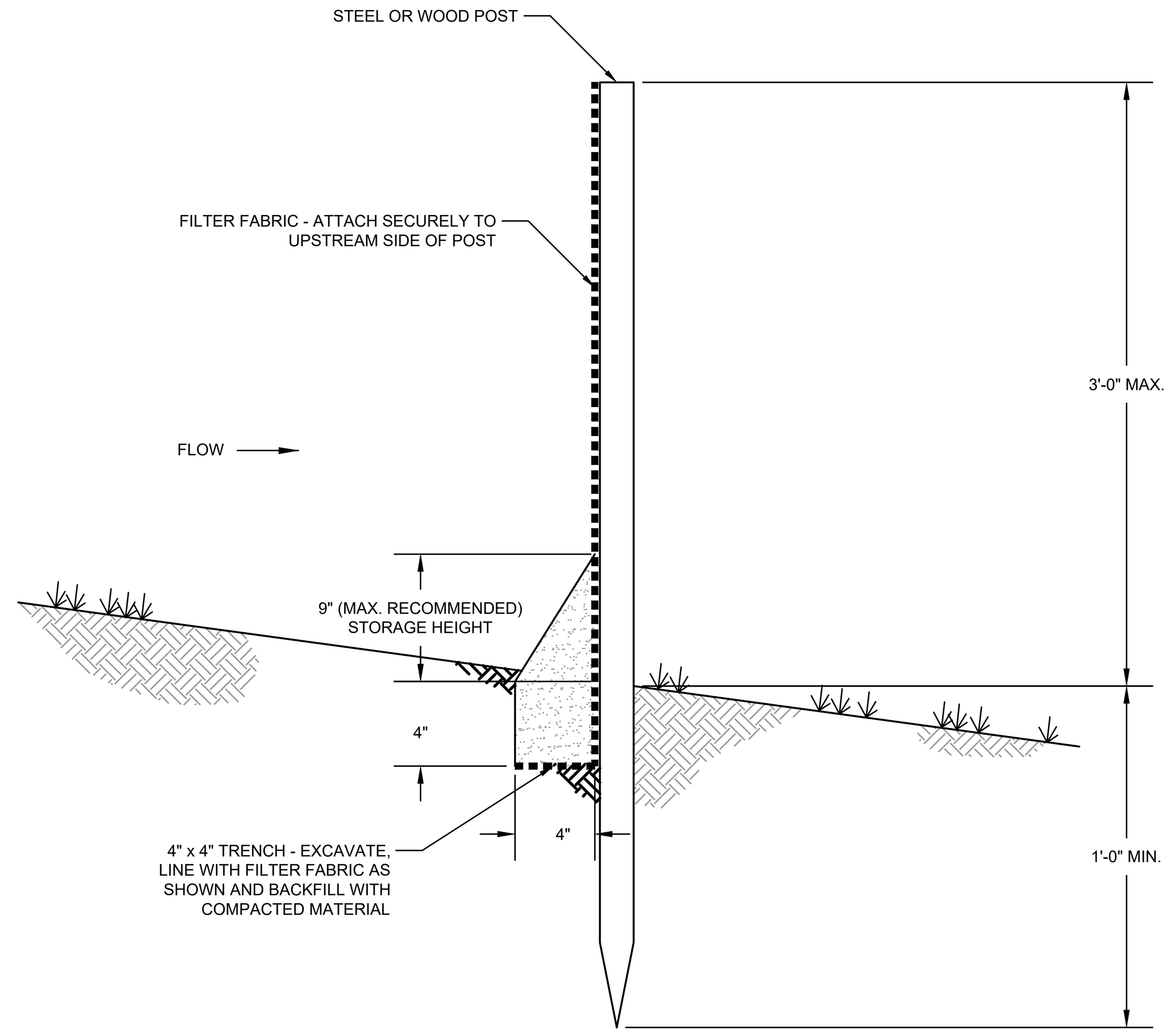

DETAIL 1 - TEMPORARY SILT FENCE
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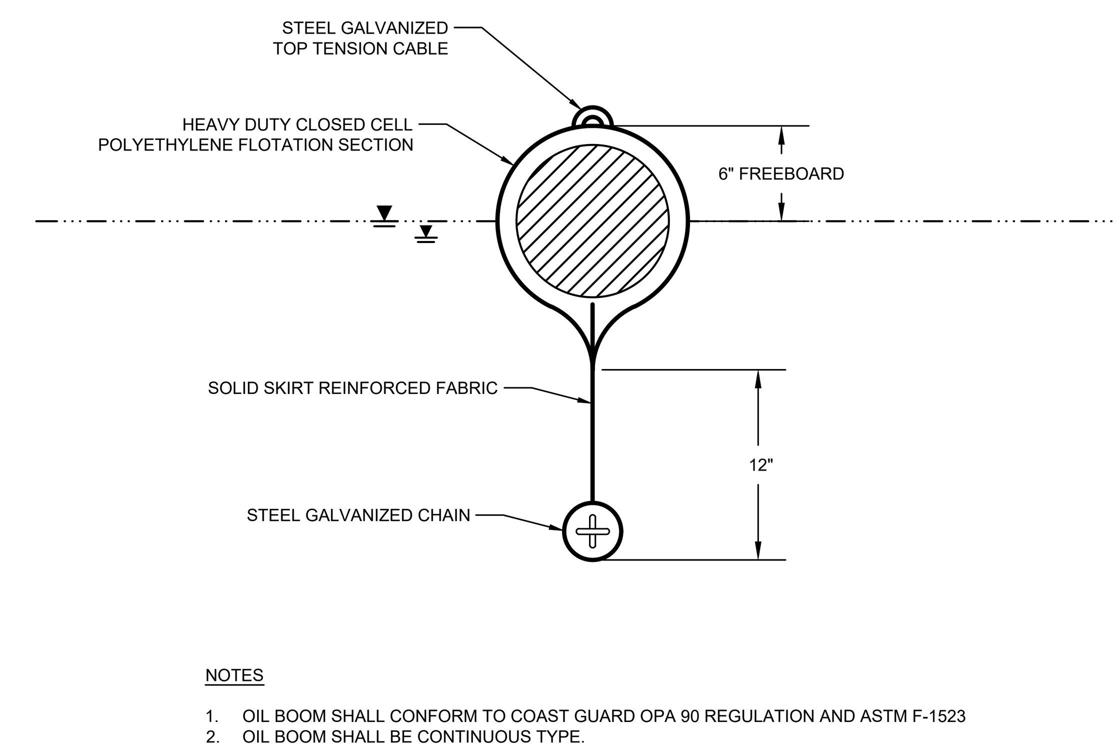
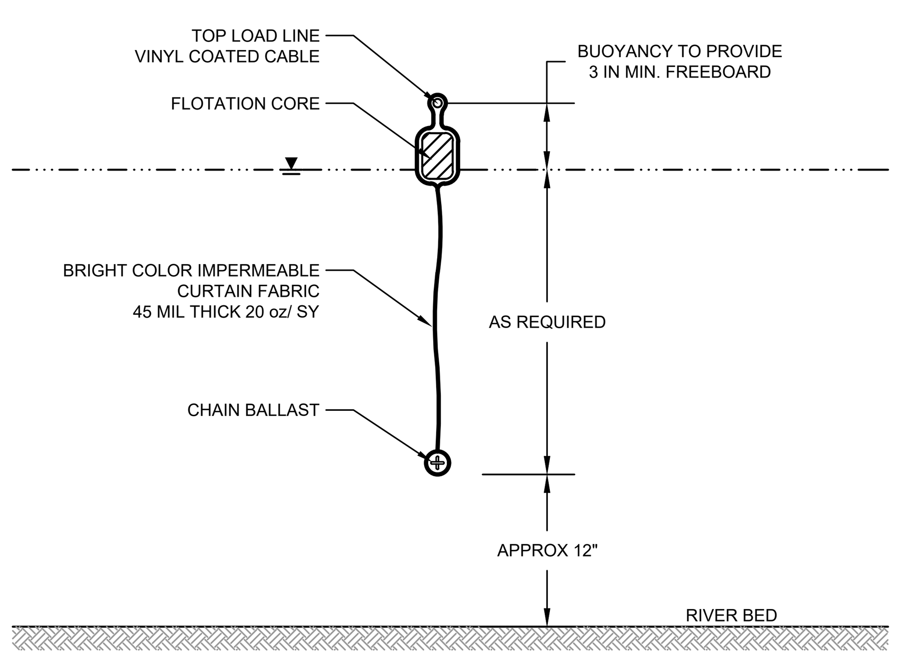


NOTES

1. OIL BOOM SHALL CONFORM TO COAST GUARD OPA 90 REGULATION AND ASTM F-1523
2. OIL BOOM SHALL BE CONTINUOUS TYPE.

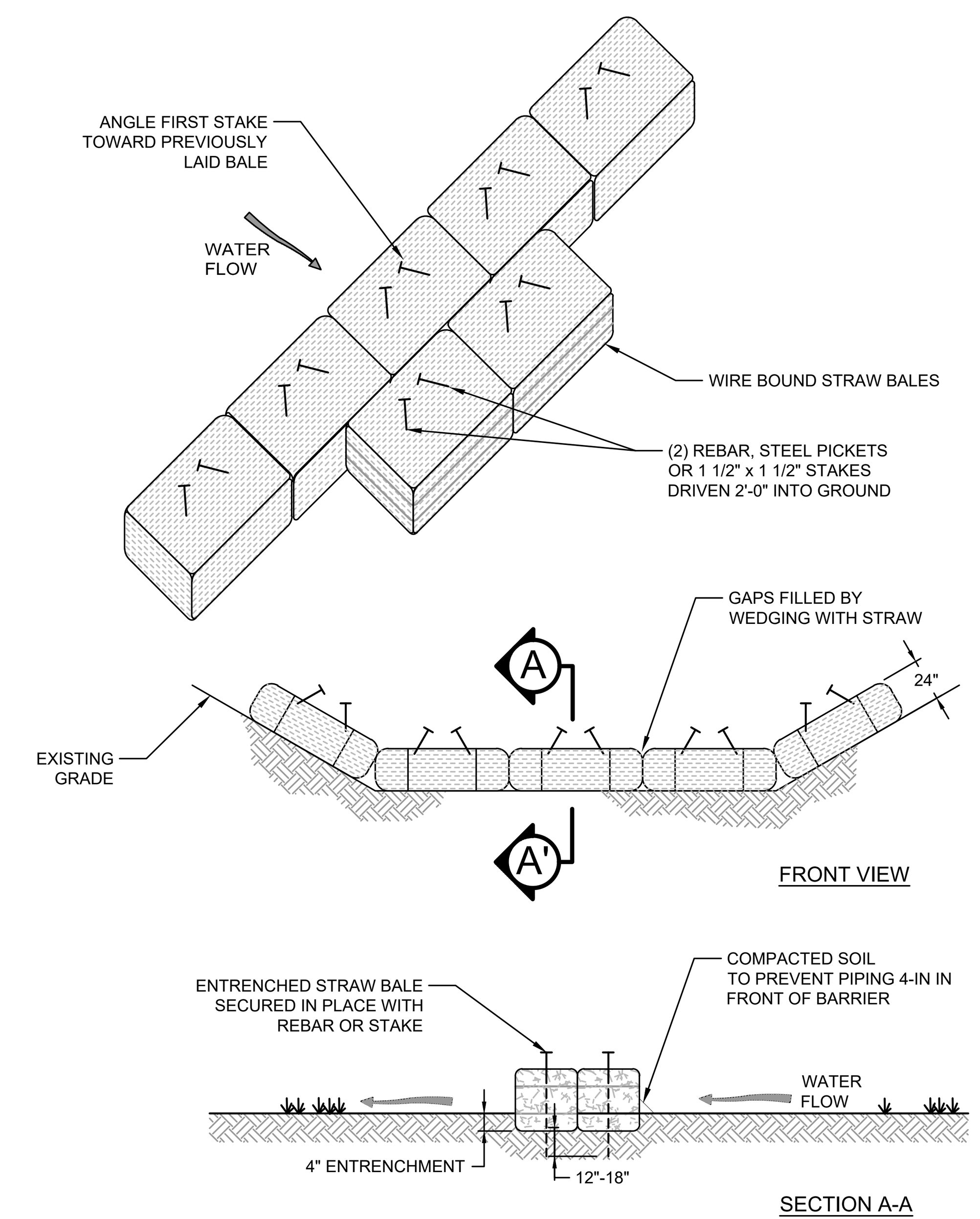
DETAIL 2 - NON-ABSORBENT OIL BOOM
N.T.S.



NOTES

1. TURBIDITY CURTAIN SHALL BE TYPE II ACCORDING TO DEPARTMENT OF THE ARMY, US ARMY CORPS OF ENGINEERS WASHINGTON, DC, ENGINEERING AND DESIGN "HANDBOOK FOR THE PREPARATION OF STORM WATER POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTIVITIES", APPENDIX 'C' BMP 27 TURBIDITY CURTAIN, DOCUMENT EP1110-1-16, 1997.
2. CURTAIN SYSTEM SHALL BE EQUIPPED WITH LOAD TRANSFER TYPE PANEL CONNECTORS, HEAT SEALED FABRIC SEAMS AND TIGHT SKIRT JOINTS.
3. INCLUDE MOORING SYSTEM IF REQUIRED.

DETAIL 3 - TURBIDITY CURTAIN
N.T.S.



NOTE:

INSTALL SECOND ROW OF STRAW BALES IN BOTTOM OF SWALE ONLY.

DETAIL 4 - STRAW BALE BARRIER
N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 9, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.

Original Size
Arch D

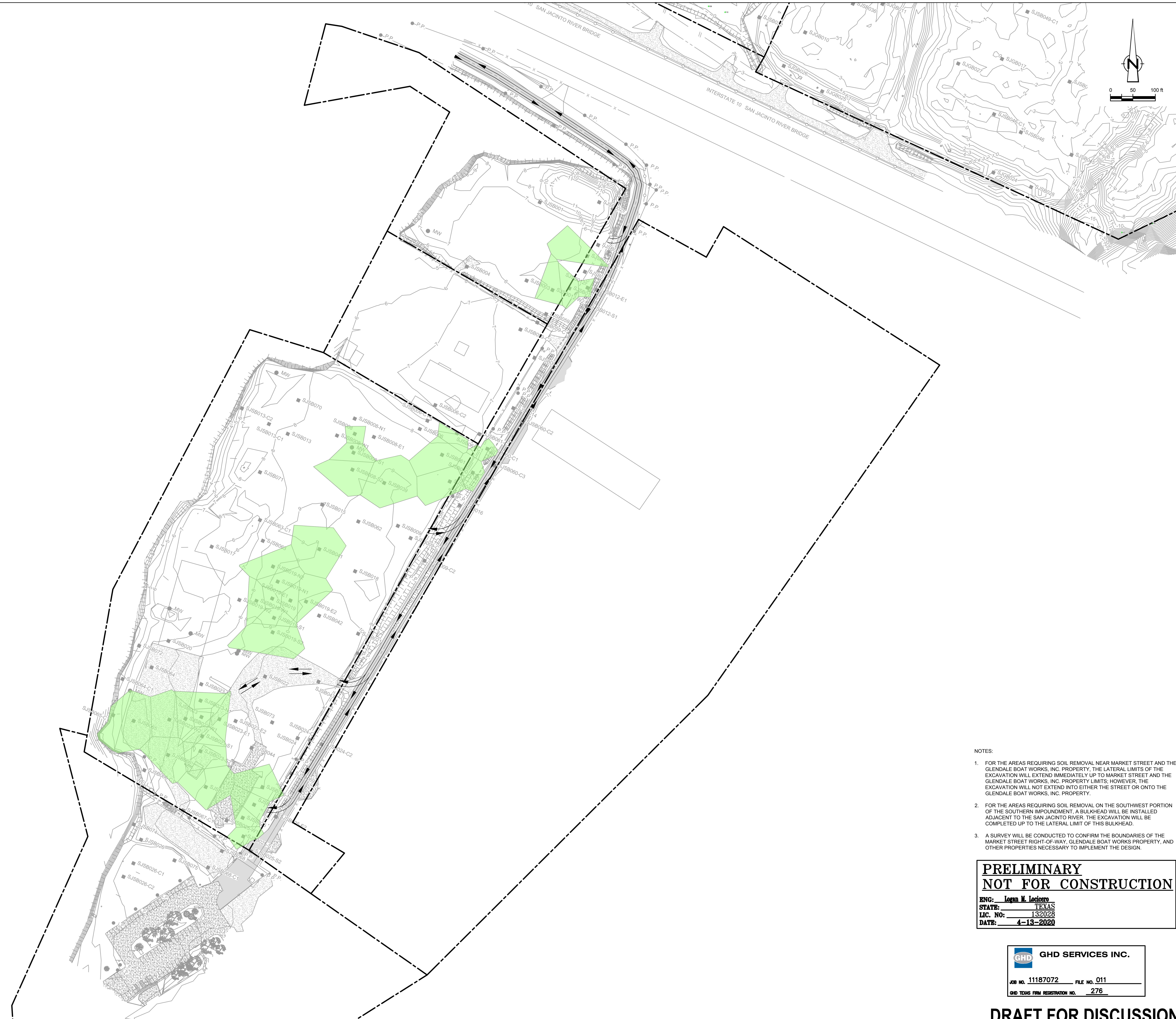
Bar is one inch on original size drawing
0 1"

Project No. 11187072

Title
SOIL EROSION AND SEDIMENT CONTROL DETAILS

Sheet No.
C-05

Sheet - of -



NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
2. FOR THE AREAS REQUIRING SOIL REMOVAL ON THE SOUTHWEST PORTION OF THE SOUTHERN IMPOUNDMENT, A BULKHEAD WILL BE INSTALLED ADJACENT TO THE SAN JACINTO RIVER. THE EXCAVATION WILL BE COMPLETED UP TO THE LATERAL LIMIT OF THIS BULKHEAD.
3. A SURVEY WILL BE CONDUCTED TO CONFIRM THE BOUNDARIES OF THE MARKET STREET RIGHT-OF-WAY, GLENDALE BOAT WORKS PROPERTY, AND OTHER PROPERTIES NECESSARY TO IMPLEMENT THE DESIGN.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

	PROPERTY BOUNDARY
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
	ROAD CENTERLINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	AREA OF CONTAMINATION
	ASPHALT
	CONCRETE
	GRAVEL
	TRAFFIC FLOW

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 100'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
PROJECT TRAFFIC CONTROL PLAN

Sheet No.
C-06

Sheet - of -

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- ROAD CENTERLINE
- BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL
- EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOE OF SLOPE
- SHEET PILE WALL ALIGNMENT

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

Client

SAN JACINTO RIVER WASTE PITS

Project

SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title

EXCAVATION PLAN 1 OF 4

Sheet No.

C-07

Sheet - of -

Plot Date: 13 April 2020 - 12:56 PM   Plotted By: Matt Wolfer   Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)CI\11187072-00(011)CI-WA007.dwg

NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- PROPERTY BOUNDARY
- 620 EXISTING CONTOUR INTERVAL
- X FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- ROAD CENTERLINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL
- 620 EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOE OF SLOPE
- SHEET PILE WALL ALIGNMENT

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

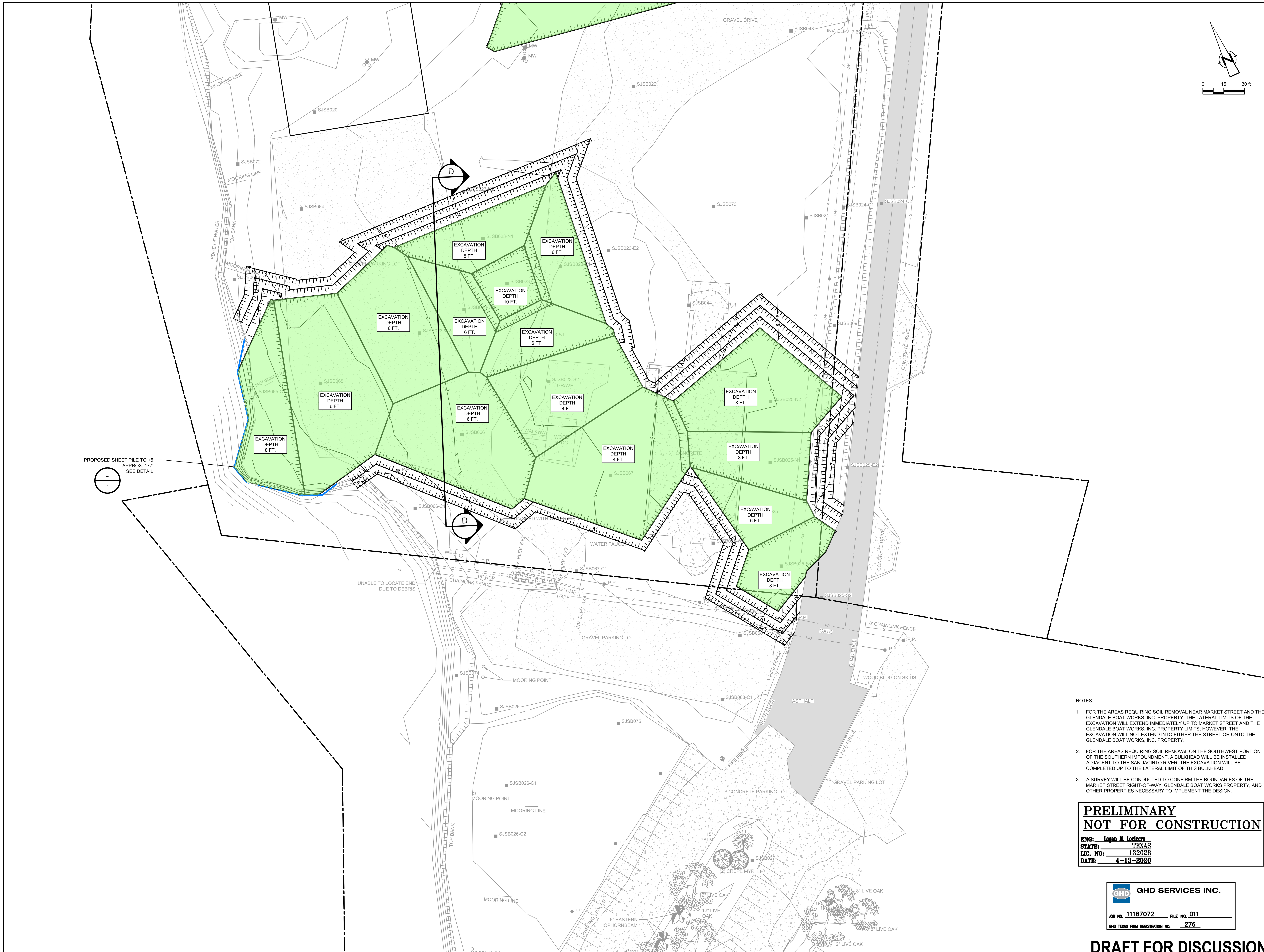
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
EXCAVATION PLAN 2 OF 4

Sheet No.
C-08

Sheet - of -



NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND
PROPERTY BOUNDARY
EXISTING CONTOUR INTERVAL
FENCELINE
SHORELINE
TOP OF BANK
TOE OF SLOPE
OVERHEAD ELECTRICAL
GUARDRAIL
ROAD CENTERLINE
BORING LOCATION
MONITORING WELL
POWER POLE
LIGHT POLE
WELL
AREA OF CONTAMINATION
ASPHALT
CONCRETE
GRAVEL
EXCAVATION CONTOUR INTERVAL
EXCAVATION TOP OF BANK
EXCAVATION TOE OF SLOPE
SHEET PILE WALL ALIGNMENT

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing	0 1"

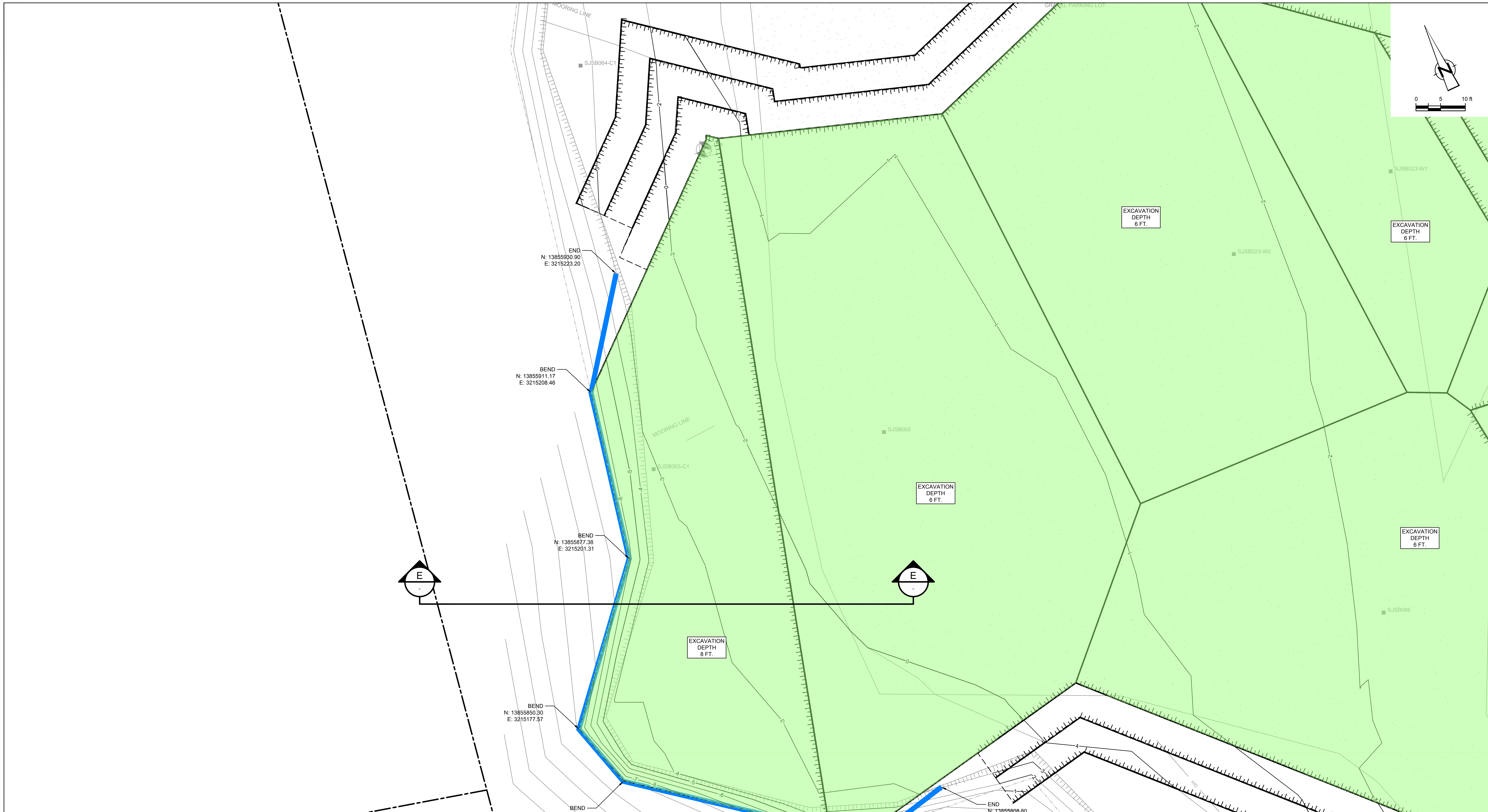
Project No. 11187072

Title
EXCAVATION PLAN
3 OF 4

Sheet No.
C-09

Sheet - of -

Plot Date: 13 April 2020 - 1:10 PM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)CI\11187072-00(011)CI-WA007.dwg



NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND
PROPERTY BOUNDARY
620 EXISTING CONTOUR INTERVAL
X FENCELINE
SHORELINE
TOP OF BANK
TOE OF SLOPE
O/H OVERHEAD ELECTRICAL
GUARDRAIL
ROAD CENTERLINE
SJSB002 BORING LOCATION
MW MONITORING WELL
P.P. POWER POLE
L.P. LIGHT POLE
WELL WELL
AREA OF CONTAMINATION
ASPHALT
CONCRETE
GRAVEL
620 EXCAVATION CONTOUR INTERVAL
EXCAVATION TOP OF BANK
EXCAVATION TOE OF SLOPE
SHEET PILE WALL ALIGNMENT

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	SC	03/30/2020

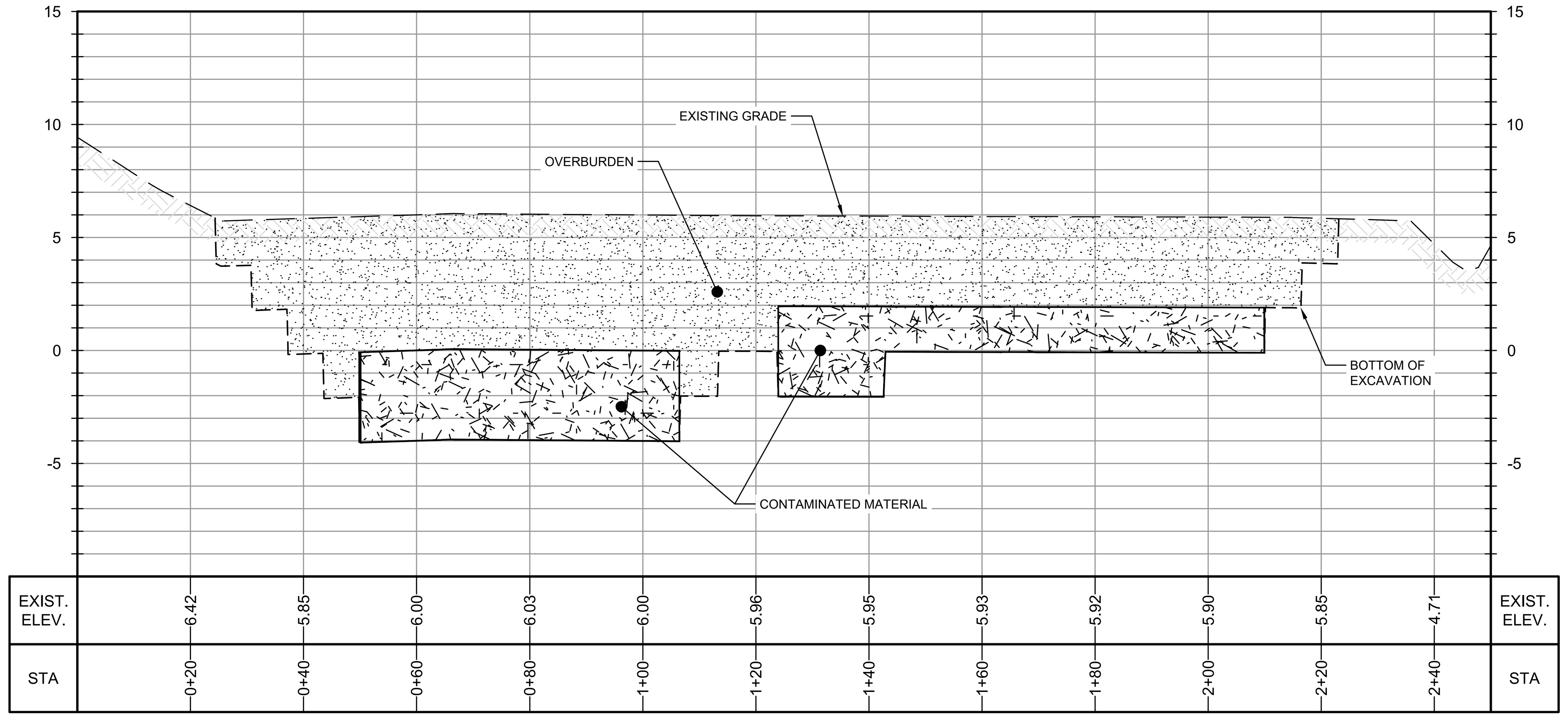
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 10'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

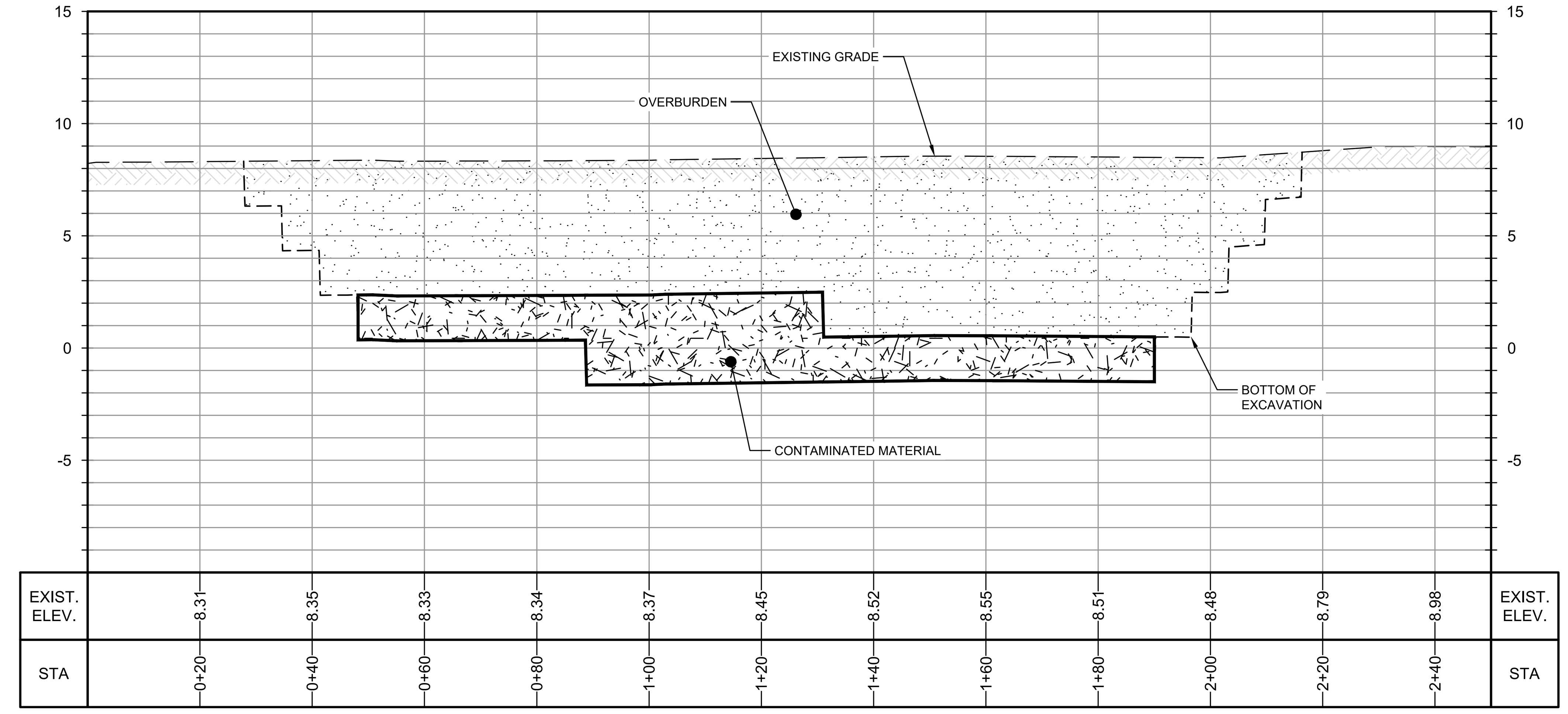
Title
EXCAVATION PLAN 4 OF 4

Sheet No.
C-10

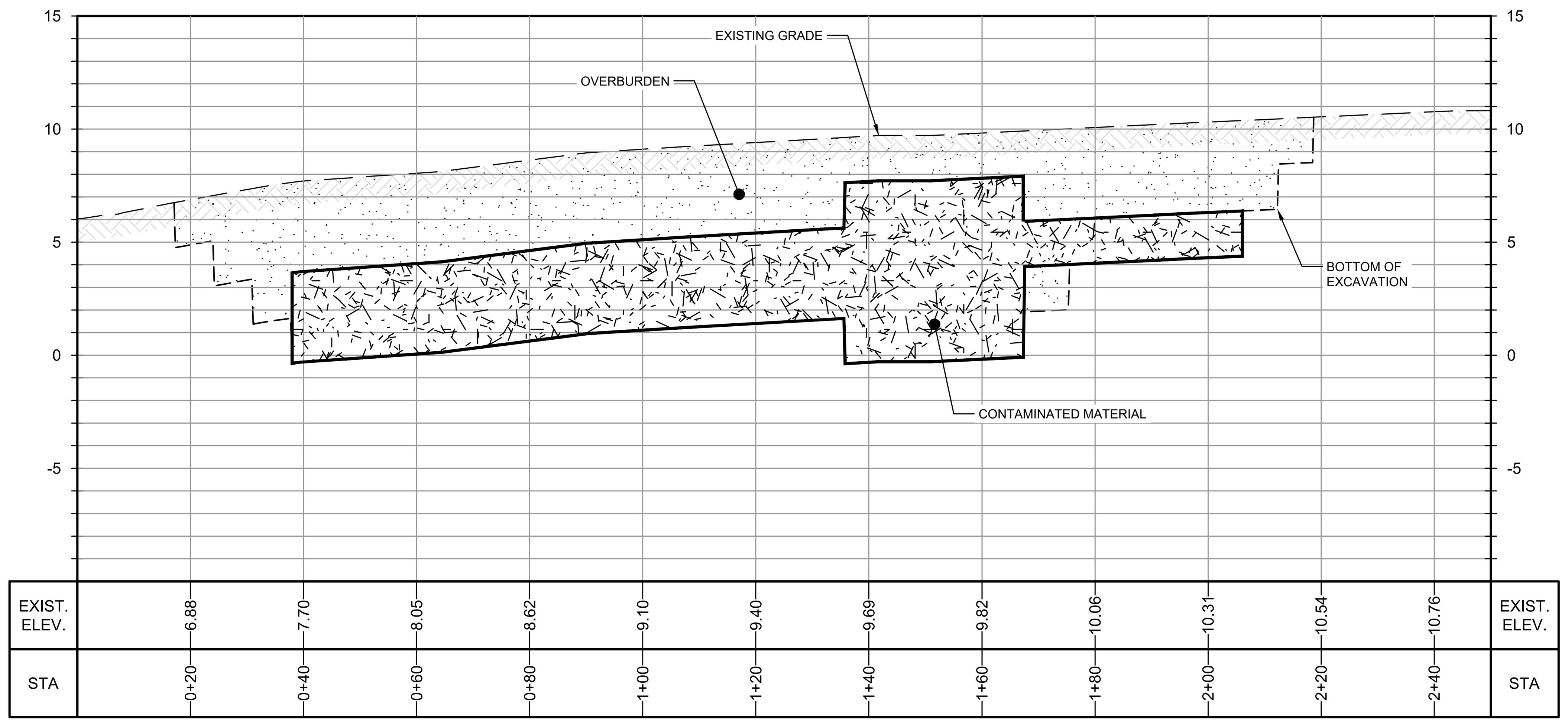
Sheet - of -



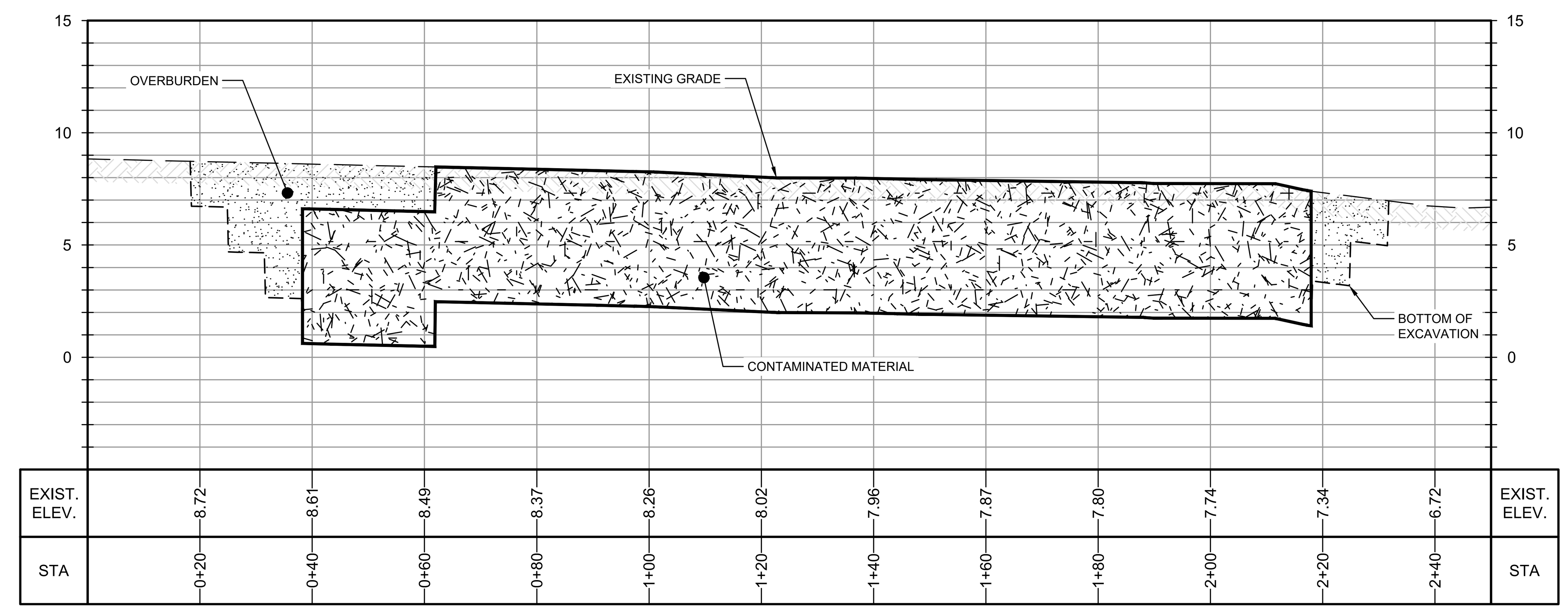
SECTION A
HORIZ: 1"=20'
VERT: 1"=5'



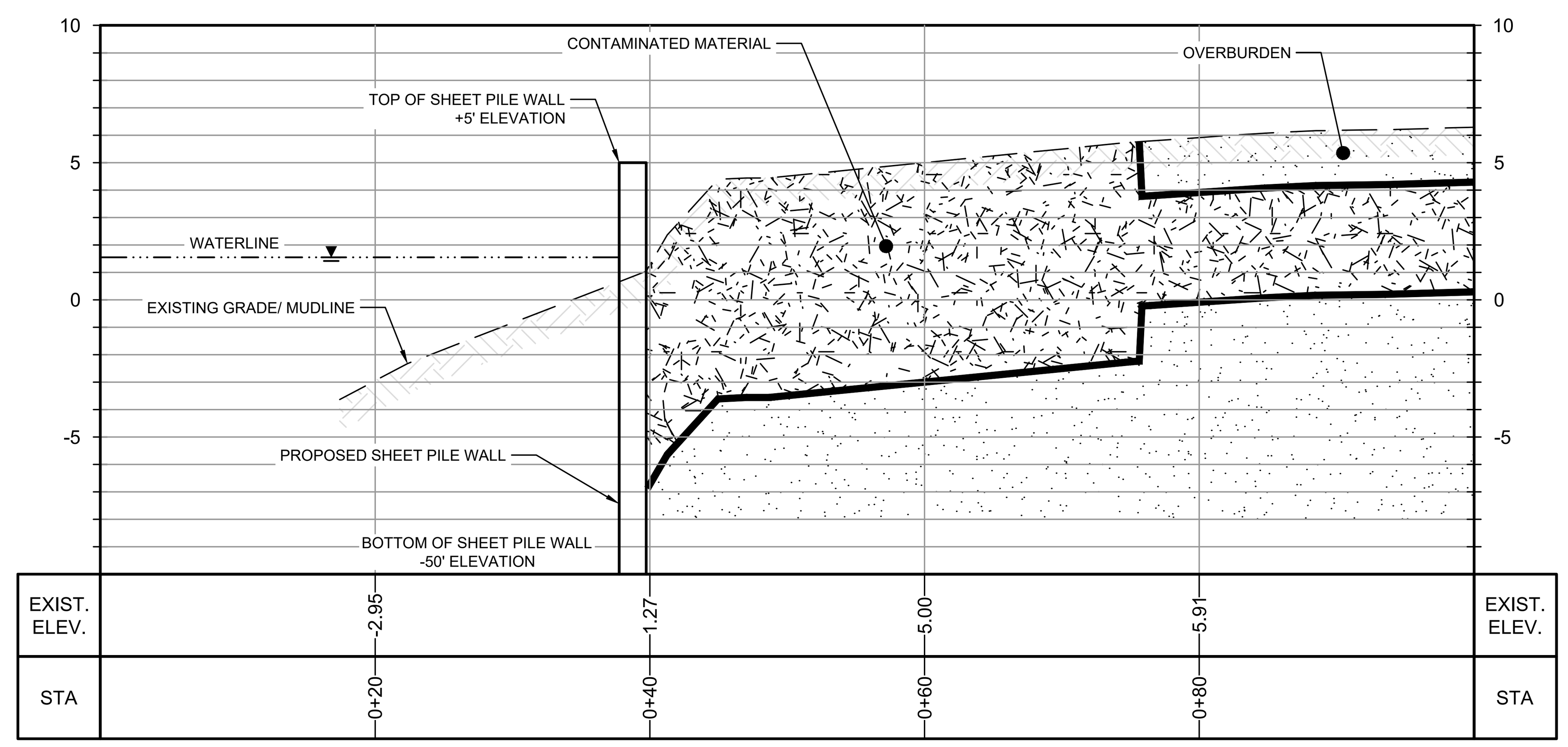
SECTION B
HORIZ: 1"=20'
VERT: 1"=5'



SECTION C
HORIZ: 1"=20'
VERT: 1"=5'



SECTION D
HORIZ: 1"=20'
VERT: 1"=5'



SECTION E
HORIZ: 1"=10'
VERT: 1"=5'

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
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Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn MW | Designer RH
Drafting Check BP | Design Check LL
Project Coordinator CM | Date Apr 10, 2020
This document shall not be used for construction unless signed and sealed for construction. | Scale AS SHOWN
Original Size Arch D | Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
EXCAVATION SECTIONS

Sheet No.
C-11

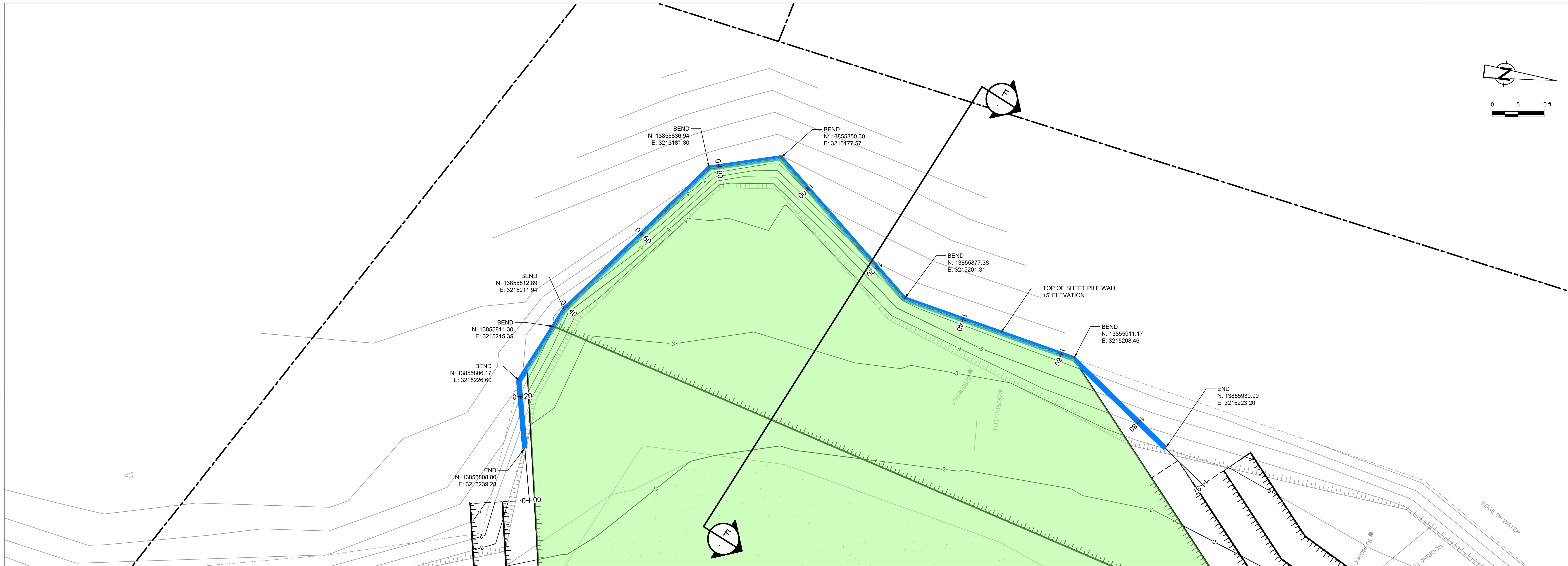
Sheet - of -

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

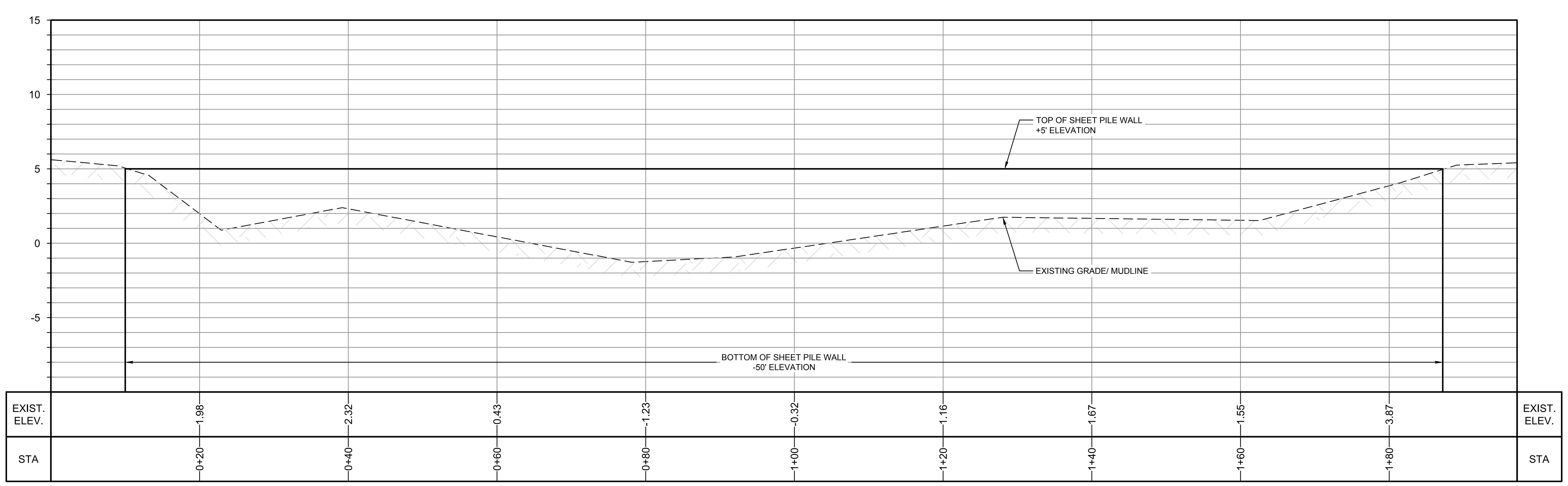
GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

Plot Date: 10 April 2020 - 4:09 PM
Plotted By: Matt Wolfer
Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)CI-WA011.dwg



PLAN
1" = 10'



PROFILE
HORIZ: 1" = 10'
VERT: 1' = 5'

NOTES:

1. FOR THE AREAS REQUIRING SOIL REMOVAL NEAR MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY, THE LATERAL LIMITS OF THE EXCAVATION WILL EXTEND IMMEDIATELY UP TO MARKET STREET AND THE GLENDALE BOAT WORKS, INC. PROPERTY LIMITS; HOWEVER, THE EXCAVATION WILL NOT EXTEND INTO EITHER THE STREET OR ONTO THE GLENDALE BOAT WORKS, INC. PROPERTY.
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PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND
- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- ROAD CENTERLINE
- BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL
- EXCAVATION CONTOUR INTERVAL
- EXCAVATION TOP OF BANK
- EXCAVATION TOE OF SLOPE
- SHEET PILE WALL ALIGNMENT

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	04/13/2020
1	30% CLIENT REVIEW	MW	SC	03/30/2020

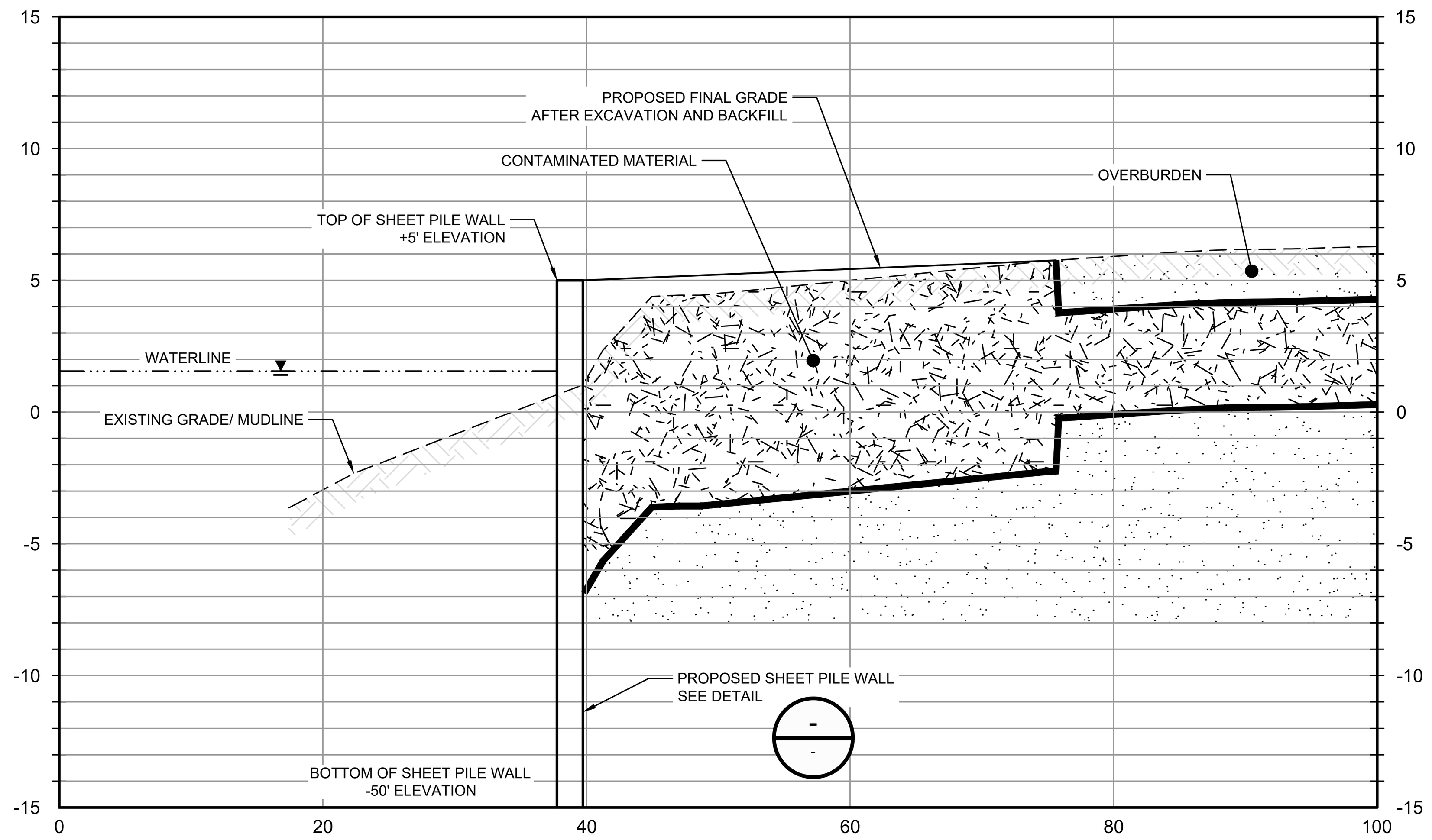
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 13, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

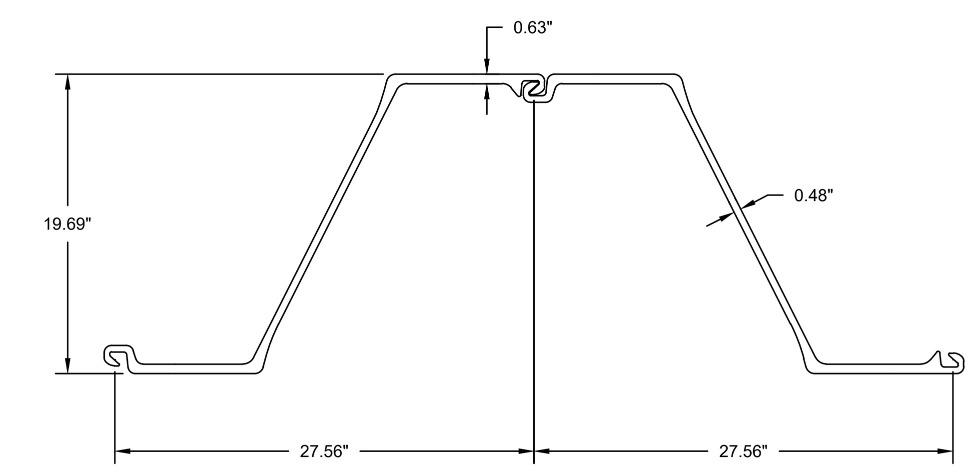
Title
SHEET PILE PLAN AND PROFILE

Sheet No.
C-12

Sheet - of -



SECTION F - TYPICAL SHEET PILE
N.T.S.



DETAIL - - AZ SHEET PILE
N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	04/13/2020
1	30% CLIENT REVIEW	MW	SC	03/30/2020

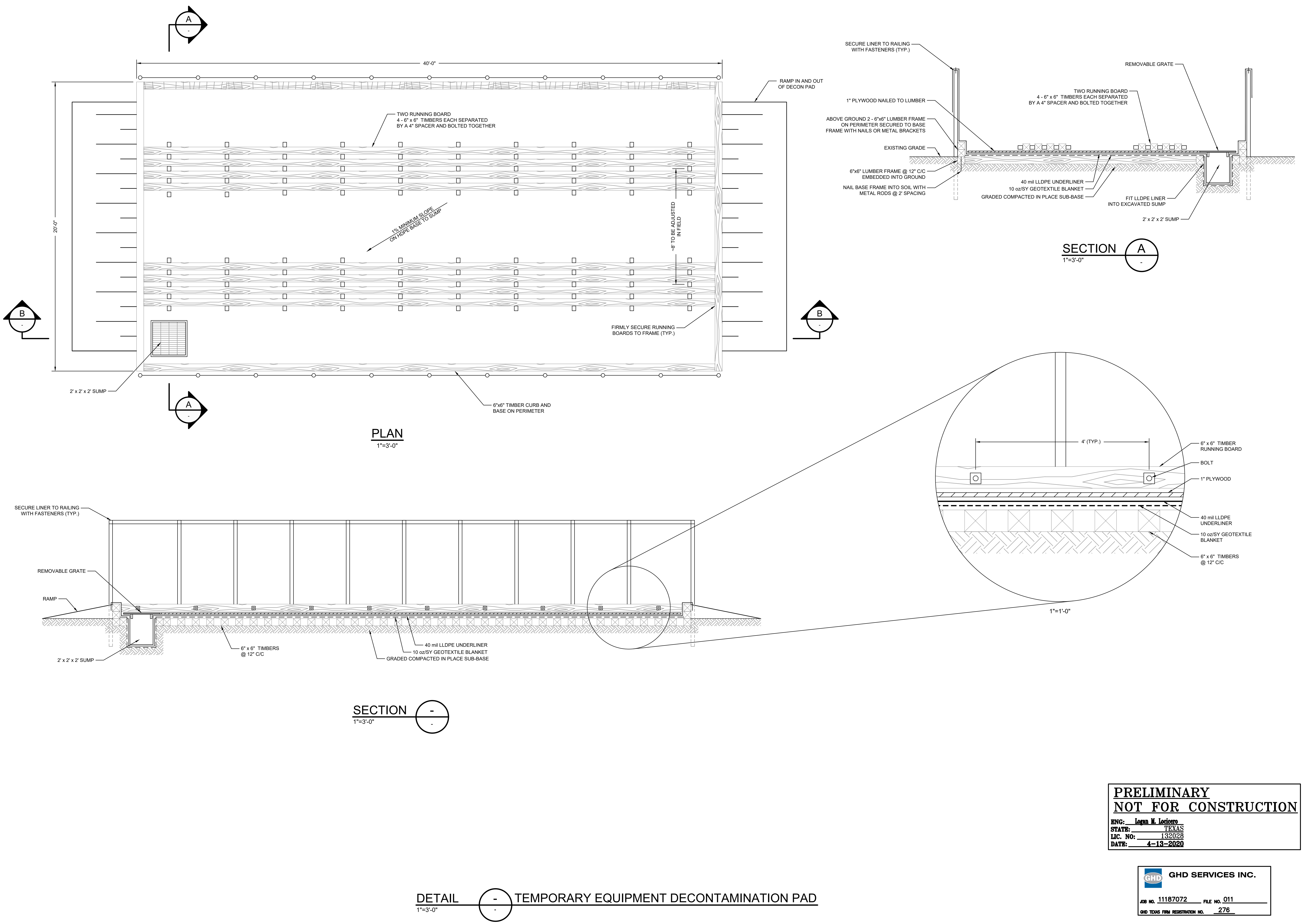
Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date Apr 9, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale N.T.S.
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
SHEET PILE DETAILS

Sheet No.
C-13

Sheet - of -



PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

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SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 9, 2020
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

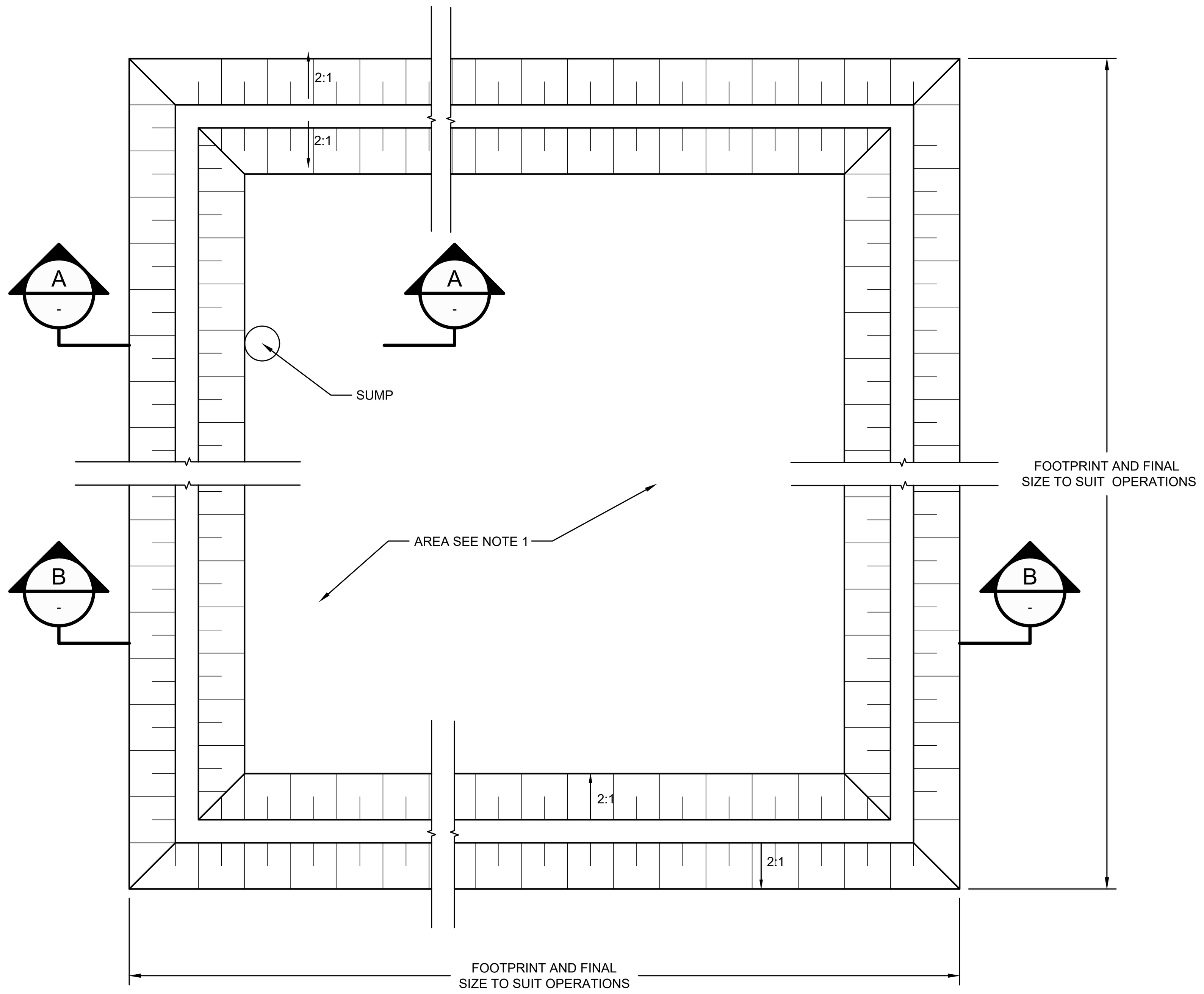
Project No. 11187072

Title
TYPICAL DETAILS 1 OF 3

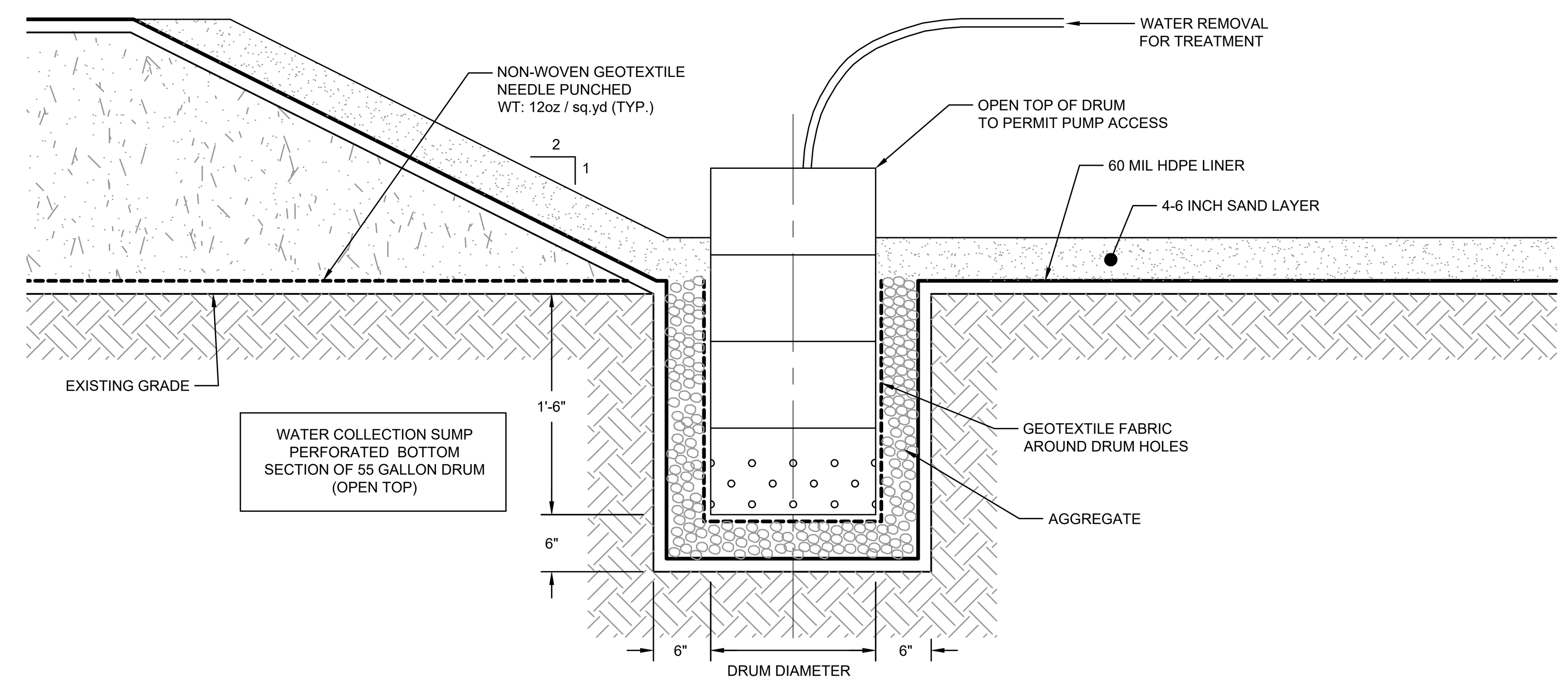
Sheet No.
C-14

Sheet - of -

Plot Date: 10 April 2020 - 4:28 PM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)CI\11187072-00(011)CI-WA014.dwg



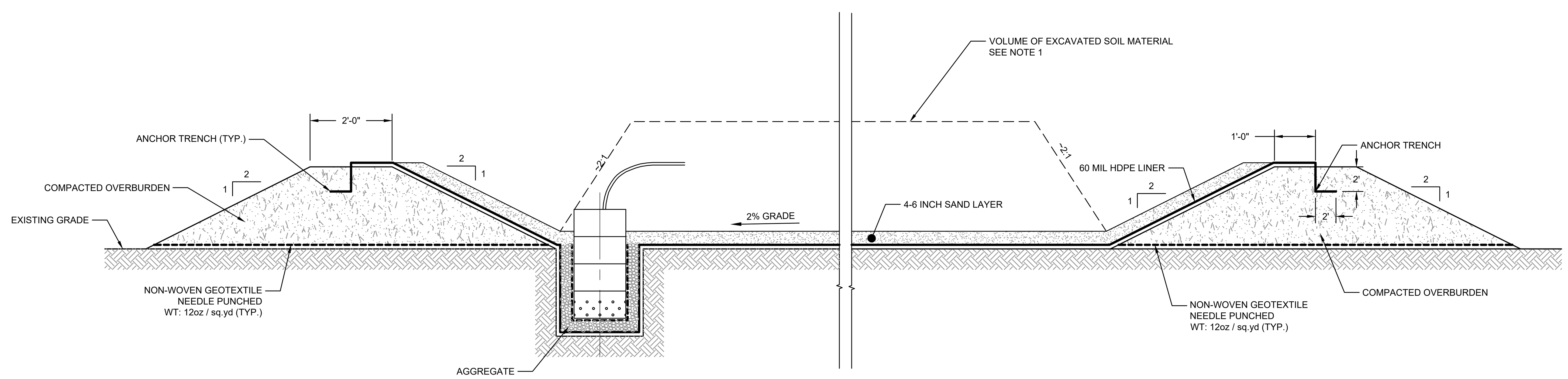
PLAN
N.T.S.



SECTION A - SUMP
N.T.S.

NOTES:

1. TYPICAL DETAILS SHOWN AT DEWATERING AND STABILIZATION AREA MAY BE REVISED BY THE CONTRACTOR. CONTRACTOR'S REVISED DETAILS SHALL BE SUBMITTED FOR REVIEW PRIOR TO CONSTRUCTION.



SECTION B -
N.T.S.

DETAIL - - TEMPORARY DEWATERING FACILITY
N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 9, 2020
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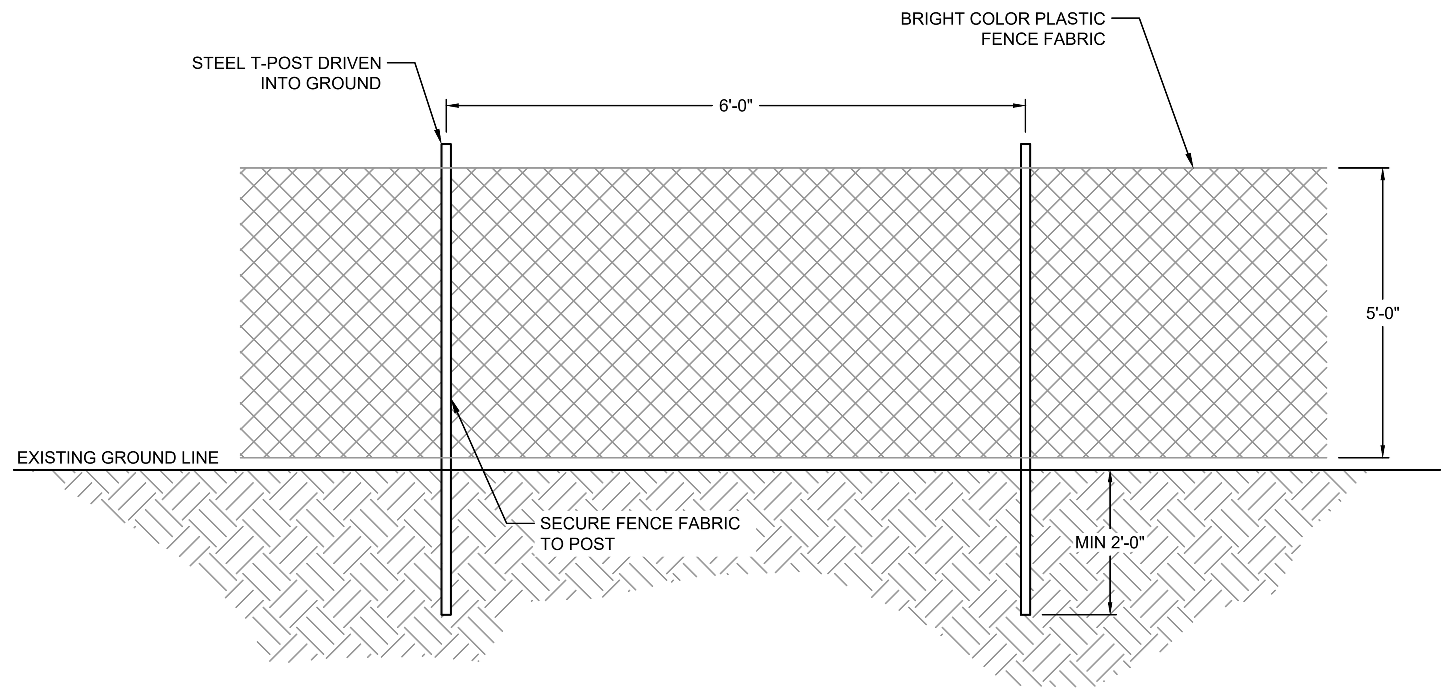
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
TYPICAL DETAILS
2 OF 3

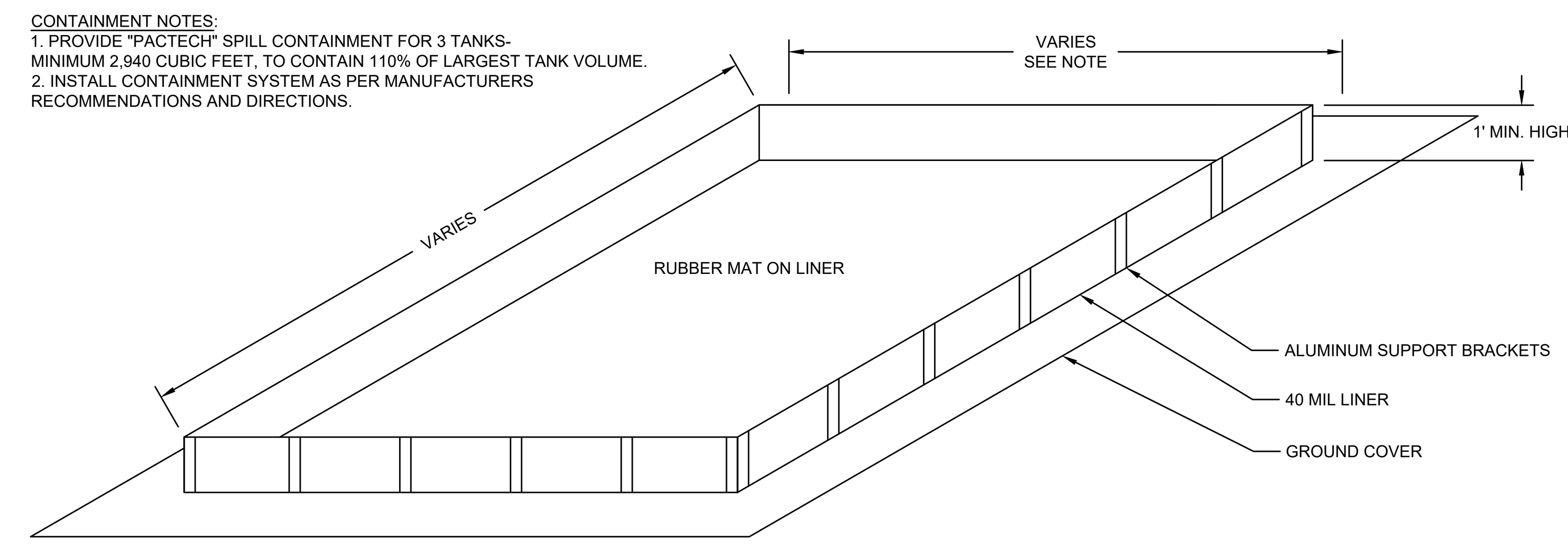
Sheet No.
C-15

Sheet - of -

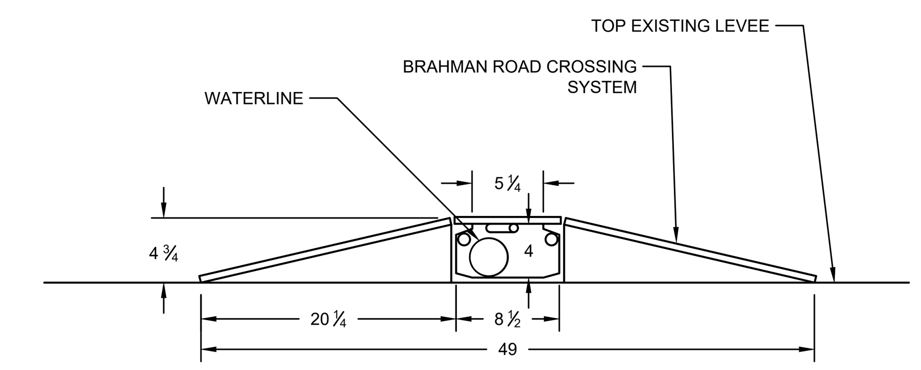


DETAIL - TEMPORARY CONSTRUCTION FENCE AROUND EXCAVATIONS (TYP.)
N.T.S.

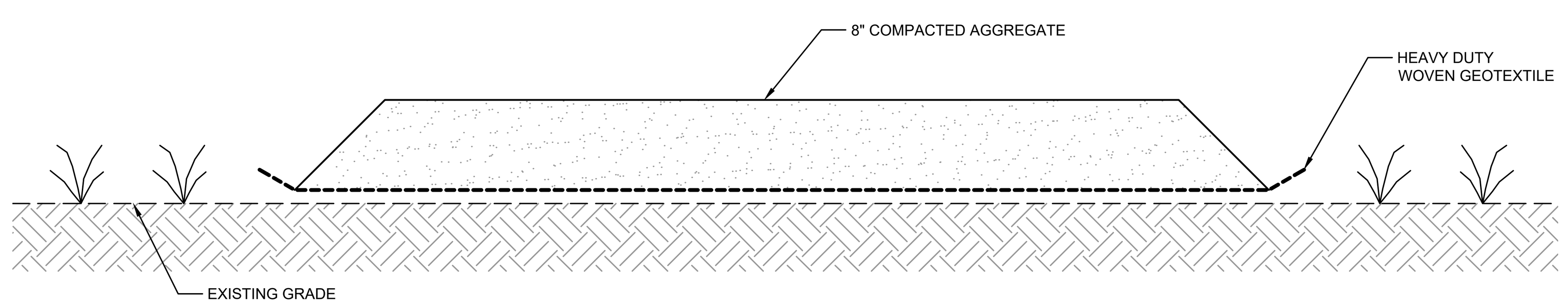
CONTAINMENT NOTES:
1. PROVIDE "PACTECH" SPILL CONTAINMENT FOR 3 TANKS-MINIMUM 2,940 CUBIC FEET, TO CONTAIN 110% OF LARGEST TANK VOLUME.
2. INSTALL CONTAINMENT SYSTEM AS PER MANUFACTURERS RECOMMENDATIONS AND DIRECTIONS.



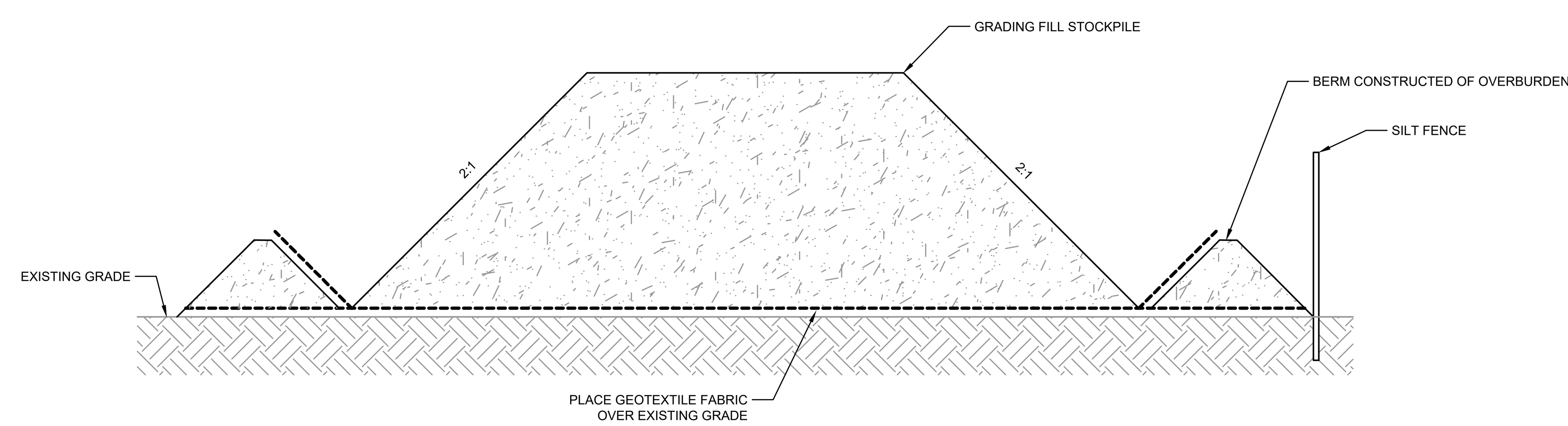
DETAIL - WATER STORAGE TANK CONTAINMENT PAD
N.T.S.



DETAIL - TEMPORARY PIPE CROSSING PROTECTION
1"=1'-0"



DETAIL - TEMPORARY GRAVEL ACCESS ROAD
N.T.S.



DETAIL - TEMPORARY OVERBURDEN STOCKPILE
N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	04/13/2020
1	30% CLIENT REVIEW	MW	RH	03/30/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	Apr 9, 2020
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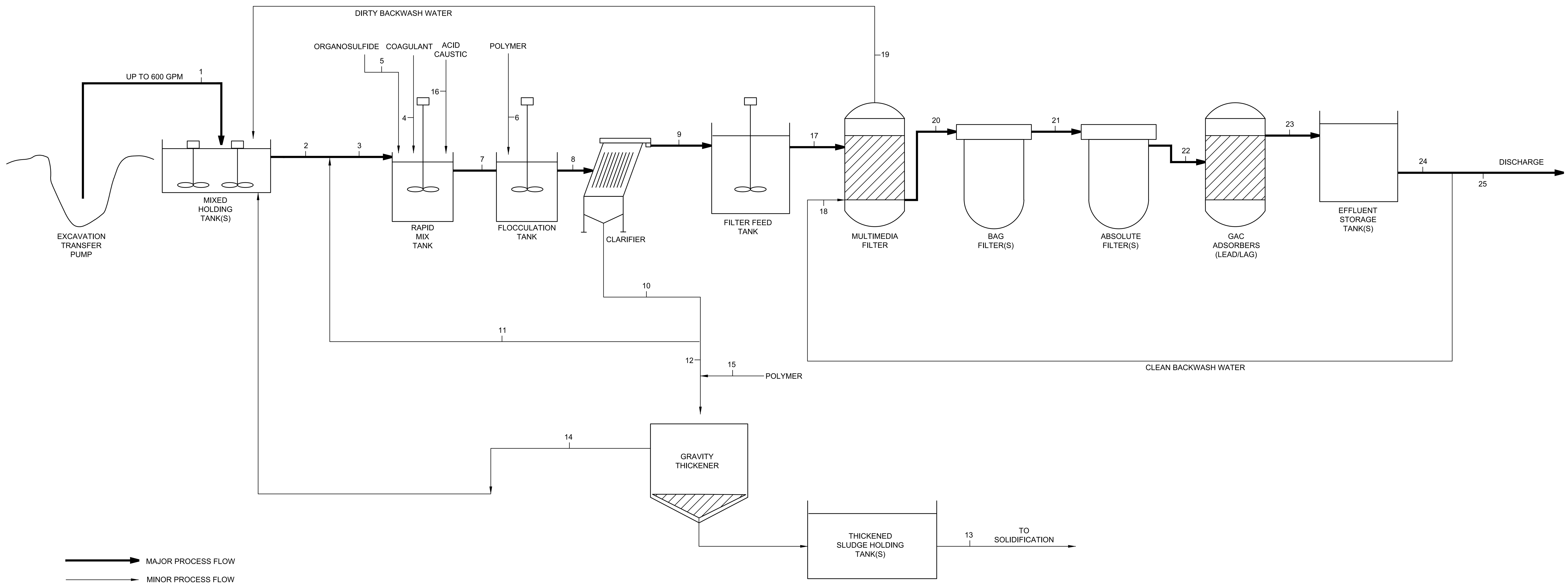
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
TYPICAL DETAILS
3 OF 3

Sheet No.
C-16

Sheet - of -



WATER TREATMENT PLANT PROCESS STREAMS

Streams		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Units	Contact Water	Mixed Holding Tank(s)	Rapid Mix Tank Influent	Coagulant Feed	Organosulfide Feed	Polymer Feed	Flocculation Tank Influent	Flocculation Tank Effluent	Clarifier Effluent	Clarifier Underflow	Sludge Recycle	Sludge to Thickener	Sludge to Solidification	Decant to Holding Tank(s)	Polymer Feed	Acid/Caustic Feed	Sand Filter Feed	Clean Back-wash	Dirty Back-wash	Bag Filter Feed	Absolute Filter Feed	GAC Absober Feed	Effluent Storage Tank Feed	Effluent Storage Tank	Discharge
Volumetric Flow	gpm	600	421	772	0.02	0.03	0.2	773	773	304	468	351	117	17	100	0.059	0.015	304	21	21	304	304	304	304	304	284
Total Mass Flow	lb/hr	300,240	210,805	386,519	14	14	107	394,369	386,660	152,351	241,313	180,985	60,328	10,013	50,227	30	8	152,351	10,458	10,458	152,351	152,347	152,347	152,347	152,347	141,888
Suspended Solids	%	0.41%	0.29%	0.61%	0.50%	0.50%	1.00%	0.61%	0.61%	0.00%	1.00%	1.00%	1.00%	6.00%	0.01%	1.00%	10.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chemical Feed	ppm				50.0	50.0	500.0									500.0	50.0									
Chem Solids Generation	lb/lb				0.3	0.3	0.01									0.01	0.1									
Chem Solids Generation	lb/hr				3.2	3.2	1.1									0.0	0.0									
Mass Flow Liquid	lb/hr	299,024	210,193	384,150	11	11	105	391,951	384,290	152,347	238,900	179,175	59,725	9,412	50,225	29	8	152,347	10,458	10,457	152,347	152,347	152,347	152,347	152,347	141,888
Mass Flow Solids	lb/hr	1,216	612	2,369	3.2	3.2	1.1	2,418	2,370	4.6	2,413	1,810	603	601	2.5	0.3	0.8	4.6	0.02	1.5	3.0	0.6	0.3	0.3	0.3	0.3
Specific Gravity		1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Density	lb/cf	62.4	62.4	62.4	81.1	62.4	62.4	63.6	62.4	62.4	64.3	64.3	64.3	74.9	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4

NOTE:
1. SOME PROCESS FLOWS ARE AVERAGED OVER ESTIMATED TOTAL OPERATING CYCLE. PROCESS FLOW/MASS BALANCE SHOULD NOT BE USED FOR EQUIPMENT SIZING PURPOSES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130376
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER
WASTE PITS

Project
SOUTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	NF	04/13/2020
1	30% CLIENT REVIEW	BP	NF	03/30/2020

Drawn BP | Designer KJ
Drafting Check MW | Design Check NF
Project Coordinator CM | Date Apr 9, 2020
This document shall not be used for construction unless signed and sealed for construction. | Scale N.T.S.
Original Size Arch D | Bar is one inch on original size drawing 0 1"

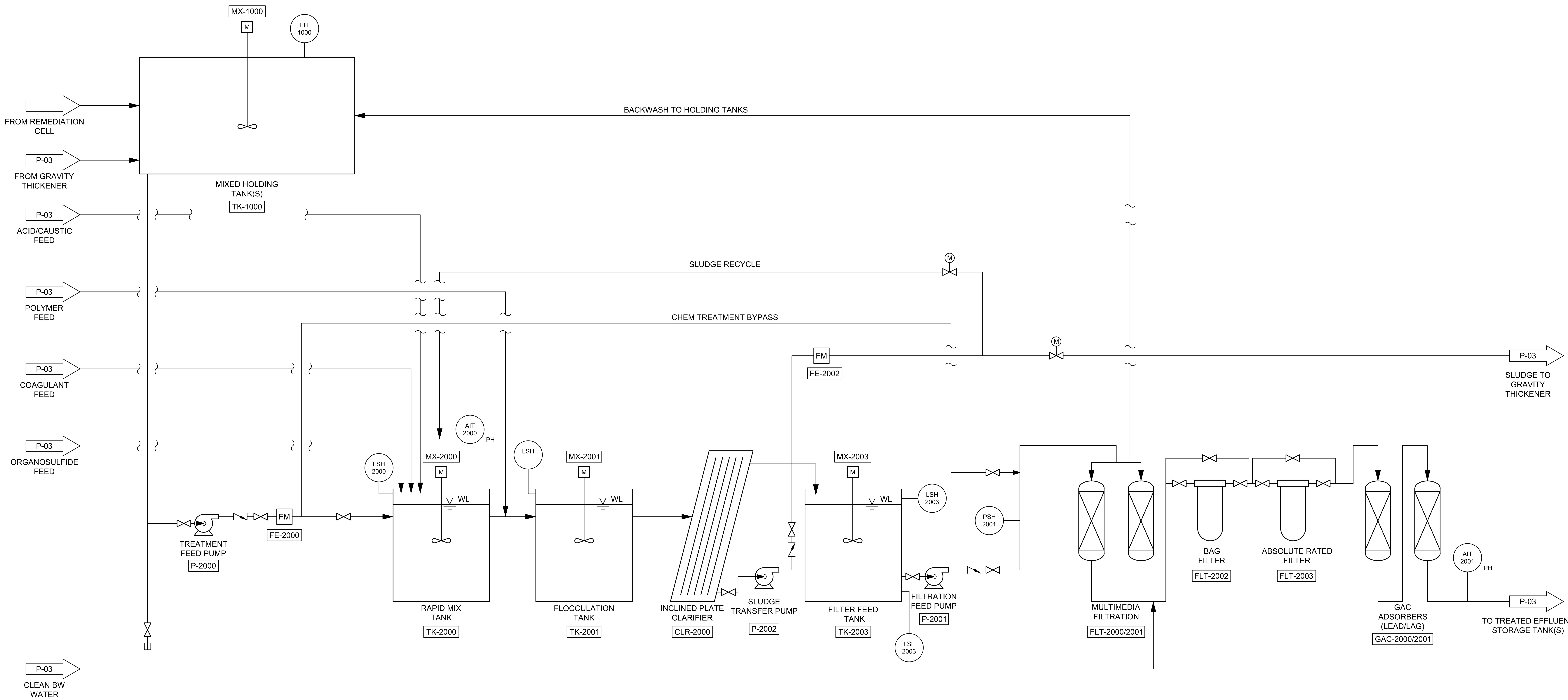
Project No. 11187072

Title
WATER TREATMENT SYSTEM
PROCESS FLOW DIAGRAM/
MASS BALANCE

Sheet No.
P-01

Sheet - of -

Plot Date: 10 April 2020 - 4:39 PM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BATShared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)PR\11187072-00(011)P-WA001.dwg



NOTE:
1. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130376
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	NF	04/13/2020
1	30% CLIENT REVIEW	BP	NF	03/30/2020

Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	Apr 9, 2020
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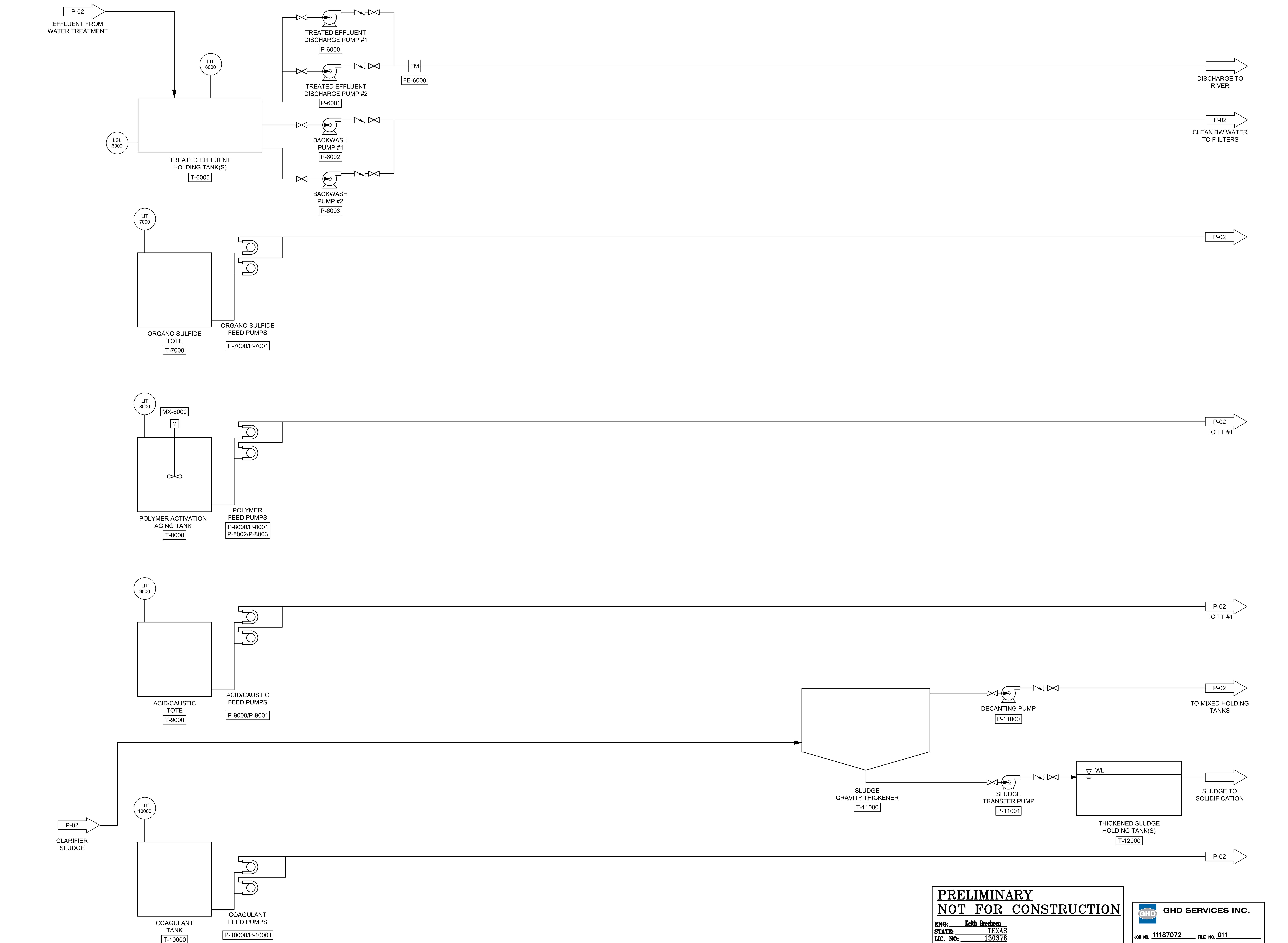
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
WATER TREATMENT SYSTEM P&ID (1 OF 2)

Sheet No.
P-02

Sheet - of -



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PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	NF	04/13/2020
1	30% CLIENT REVIEW	BP	NF	03/30/2020

Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	Apr 9, 2020
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

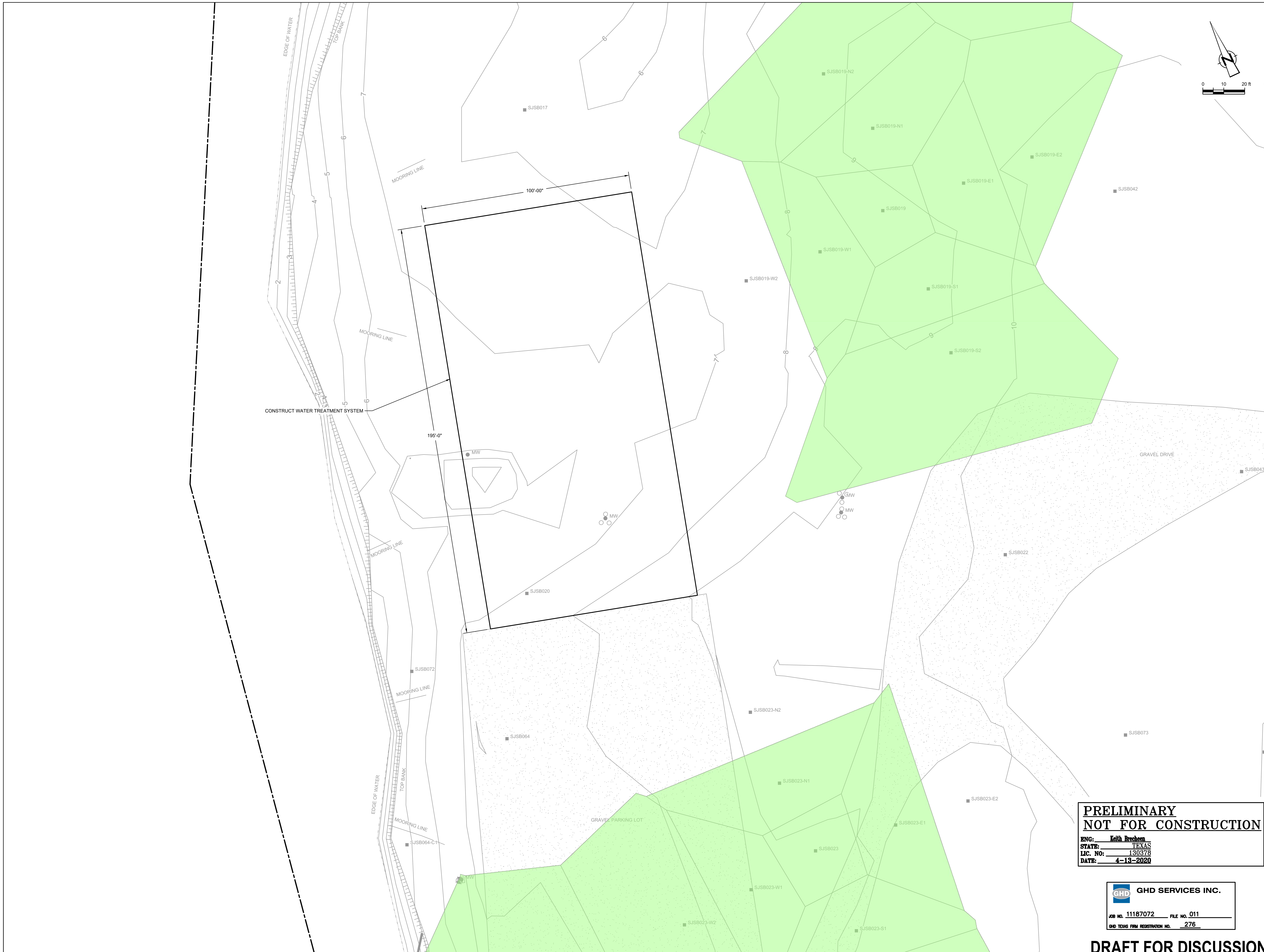
Project No. 11187072

Title
WATER TREATMENT SYSTEM P&ID (2 OF 2)

Sheet No.
P-03

Sheet - of -

Plot Date: 10 April 2020 - 4:36 PM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(011)\11187072-00(011)PR\11187072-00(011)P-WA003.dwg



PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130376
DATE: 4-13-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 011
GHD TEXAS FIRM REGISTRATION NO. 276

DRAFT FOR DISCUSSION

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND
- PROPERTY BOUNDARY
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- ROAD CENTERLINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA OF CONTAMINATION
- ASPHALT
- CONCRETE
- GRAVEL

NOTE:
PROPERTY BOUNDARY IS APPROXIMATE (TO BE CONFIRMED BY A PROFESSIONAL LICENSED SURVEYOR)

SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO AUGUST 2, 2019

Client
SAN JACINTO RIVER WASTE PITS

Project
SOUTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	NF	04/13/2020
1	30% CLIENT REVIEW	MW	NF	03/30/2020

Drawn	MW	Designer	KJ
Drafting Check	BP	Design Check	NF
Project Coordinator	CM	Date	Apr 9, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 20'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. **11187072**

Title
WATER TREATMENT SYSTEM SITE PLAN

Sheet No.
P-04

Sheet - of -

about

GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

Charles W. Munce
Charles.Munce@GHD.com
225.292.9007

Janie T. Smith
Janie.Smith@GHD.com
225.292.9007

www.ghd.com