US Army Corps of Engineers®
Buffalo District

Site Inspection Report

Joslyn Manufacturing Site
Fort Wayne Indiana

Prepared by:

U.S. Army Corps of Engineers,
Buffalo District
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Abbreviations, Acronyms, and Symbols

AEC	Atomic Energy Commission
amsl	Above mean sea level
ANL	Argonne National Lab
AR	Army Regulation
Architect and Engineer	A-E
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CQARs	Chemical Quality Assurance Reports
DoD	Department of Defense
DOE	Department of Energy
dpm	Disintegrations per minute
EDR	Environmental Data Resources
EM	Engineer Manual
EPA	Environmental Protection Agency
FUSRAP	Formerly Utilized Sites Remedial Action Program
gpm	Gallons per minute
HASL	Health and Safety Laboratory (AEC)
MARLAP	Multi-Agency Radiological Laboratory Analytical Protocols Manual
MED	Manhattan Engineer District
MCL	Maximum Contaminant Level
MOU	Memorandum of Understanding
mph	Miles per hour
MS/MSD	Matrix-spike/matrix-spike duplicates
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
NRCS	National Resource Conservation Service
ORNL	Oak Ridge National Laboratory
PA	Preliminary Assessment
pCi/g	Pico curies per gram
pCi/L	Picocuries per liter
pH	potential of hydrogen
QA	Quality Assurance
QAPP	Quality assurance project plan
QSM	Quality Systems Manual
RESRAD	Residual Radioactive Material at Remediation Sites
RL	Reporting Limits
RSSI	Radiation Safety Services Inc.
SAIC	Science Applications International Corporation
SI	Site Inspection
STL	Severn Trent Laboratories
TCE	Trichloroethene

Abbreviations, Acronyms, and Symbols Continued

U	Uranium
U of C	University of Chicago
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
μR/h	microRoentgen per hour

1.0 INTRODUCTION

A Site Inspection (SI) was performed, by the United States Army Corps of Engineers (USACE), of the Joslyn Manufacturing Site following the process outlined in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP). The purpose of this assessment was to collect and analyze environmental samples for radiological constituents related to Manhattan Engineer District (MED) activities and to determine the need for further action by USACE, under the Formerly Utilized Sites Remedial Action Program (FUSRAP), to ensure the protection of human health and the environment.

In March of 1974, FUSRAP was begun under the direction of the Atomic Energy Commission (AEC) and in 1975 was assigned to the Energy and Research and Development Administration (ERDA) until the responsibility of FUSRAP was assigned to the newly created Department of Energy (DOE) in 1977. In the Energy and Water Development Appropriations Act, 1998, (Title I, Public Law 105-62, 111 Stat. 1320, 1326) Congress transferred the responsibility for the administration and execution of cleanup at eligible FUSRAP sites to USACE. In the Energy and Water Development Appropriations Act, 2000 (Title VI, Public Law 106-60, 113 Stat. 483, 502), Congress indicated that any response action taken under the FUSRAP program by the Secretary of the Army, acting through the Chief of Engineers, shall be subject to CERCLA and the NCP.

In March of 1999, USACE and DOE signed a Memorandum of Understanding (MOU) between the agencies for the purpose of delineating the administration and execution of responsibilities of each party for the FUSRAP program. Pursuant to that MOU, when a new site is considered for inclusion in the FUSRAP, DOE is responsible for performing historical research to determine if the site was used for activities which supported the Nation's early atomic energy program. If DOE concludes that the site was used for that purpose, the agency will provide USACE with that determination. The USACE completed a Preliminary Assessment in October 2005 and determined that further investigation was warranted in the form of a Site Inspection.

The purpose of a SI at potential FUSRAP sites is to obtain and analyze environmental samples for radiological constituents of concern that release or threat of release, as those terms are defined in Section 101(22) of CERCLA, of an FUSRAP eligible hazardous substance at the site that may present a threat to the public health or the environment. If a SI determines that there is a release or there is a threat of release, other than one that is federally permitted or addressed by a legally enforceable license, permit, regulation or order issued pursuant to the Atomic Energy Act of 1954 or other Federal statute, and it may present an imminent and substantial danger to the public health or the environment, CERCLA authorizes further response actions to investigate the site as necessary. Appropriate actions might be removal (if imminent threat to the human health or environment), or additional investigation potentially a Remedial Investigation/Feasibility Study, Proposed Plan and Record of Decision. If no such release or threat of release is found or no significant threat to the public health or environment is identified, the SI will recommend no further action.

1.1 Project Objectives

The principal goal of the SI is to determine whether or not there has been a release or a threat of a release of radiological contamination related to MED activities at the Joslyn Site that could pose a threat to human health or the environment. As part of this work, the following objectives were met:

- Determine if radiological contamination resulting from MED activities is present in site groundwater and soil;
- Acquire information to define the likely fate and transport of MED contaminants from the site;
- Gather sufficient data to determine whether MED contaminants may constitute a threat to human health or the environment; and
- Provide sufficient characterization data to allow completion of subsequent SI documents.

1.2 Project Scope

This project consisted of an SI of the Joslyn Manufacturing Company, located in Fort Wayne, Indiana. During this phase of the project the USACE collected soil and water sample data to determine if there is a release of radiological material associated with MED under the CERCLA guidelines. The SI will consist of three basic tasks:

- A description of current conditions which will include information gathered during any previous investigations, inspections, interim measure activities and any other relevant data, which helps to identify potential sources of contamination and to characterize the current site conditions,
- Conduct soil and ground water investigations necessary to determine if there has been a release of radiological constituents associated with the MED actions, and
- Develop a report presenting the results of previous tasks and containing a determination as to whether or not there has been a release to the environment from this site and a recommendation as to whether or not this site should be included in FUSRAP.

2.0 SITE BACKGROUND

2.1 Site Location/Description

The former Joslyn Manufacturing Company is in Allen County located in Fort Wayne, Indiana. The site is located in an industrial setting at 2302 Taylor St (Figure 1) with a Norfolk & Southern Railroad to the north, Taylor St. to the south, a drainage ditch (Junk Ditch) to the west, and commercial properties to the east borders the site(s). There are several residential, commercial, and industrial business areas within one mile from the site (e.g. churches, schools, and commercial business). Located north east of the site is Swinney Park, a recreational area for the local community.

2.2 Site Ownership and History

The Former Joslyn Manufacturing Company was bought by Slater Steel Inc. in 1981 and operated until 2003 when the company went into Chapter 11 bankruptcy. In 2004 Slater Steel was purchased by Valbruna Steel. Valbruna Steel separated the site into two separate companies Valbruna Slater Steel Inc. (Valbruna) located at 2400 Taylor St. Ft. Wayne In, and Fort Wayne Steel Corporation located at 2302 Taylor St. and is separated by a chain link fence from Valbruna Slater Steel Inc (Figure 1). Valbruna owns the buildings that are west of building 10, which is approximately 40 acres in size while Fort Wayne Steel Corp owns the buildings east of and including building 9, which is approximately 23 acres in size. Areas involved in MED activities are designated by letters A-J on the attached plant layout in Figure 2.

2.3 Site Operations and Waste Characteristics

The operational history of the former Joslyn Manufacturing and Supply Co. began with the first service contract, Subcontract Number 7401-37-9 entered on 15 August 1943 with the University of Chicago (U of C). This contract was renewed annually until contract termination on June 30, 1946. Additional documents indicate that Joslyn fabricated approximately 15 tons of uranium rods for the British and Canadian Governments beginning in August 1946. Documentation also exists that indicates that Joslyn continued to roll uranium rods until at least 1949 under MED contract. An office memorandum from F.N. Malone, Tonawanda Sub-office to R.J. Smith, Chief, Miscellaneous Operations Area, Production Division New York Operations Office, Subject: Uranium Rod Requisition NAA-SF-11, confirms a conversation dated January 22, 1952 in which one 20’ and three 10’ rods each 13/16’’ in diameter were to be shipped to Joslyn Manufacturing (USACE, 2005).

Under this contract, Joslyn performed tempering, hot rolling, quenching, straightening, cooling, grinding, abrasive cutting, waste burning and threading of natural uranium billets into metal rods. Billets were received by rail, unloaded by an overhead crane onto carts and stored in a storage area until needed. Billets were then taken to the tempering area, heated with eight small electric furnaces, and moved to the rolling mills (an 18” roughing stand, 12” intermediate mill and a 9” finishing mill were used) and quenching areas. After quenching, the rods were cropped, moved to the threading area where the rods were milled and shaved to contract specifications. The grinding process was carried out in two widely separated parts of a large shed. The first operation consisted of grinding uranium rods. This process was carried on in a small shed constructed inside a larger shed. The fumes and dust from this smaller shed was vented into the atmosphere of the larger shed. The second operation was carried out was a rough cut on the uranium rods inside of the smaller shed. The existing documentation does not give dimensions of the shed sizes (USACE, 2005).

The U-billet processing produced metal wastes that were not chemically characterized in the historical documentation. Since thorium was a component of most uranium ores used in AEC operations the potential exists for it to be present at the site. Since the potential presence of thorium onsite was not previously investigated, a limited number of samples were analyzed for isotopic thorium (EarthTech, 2006a)

The potential contaminants of concern with MED processes performed at the Joslyn Manufacturing site include uranium (U) and its' associated daughter products.

2.4 Previous Site Investigations

Four radiological surveys presently exist of the former Joslyn Manufacturing Company performed in 1949, 1976, 2004, and 2005 respectively. The 1949 survey was done at the conclusion of MED activities and was performed by A. R. Piccot of the AEC Health and Safety Laboratory (HASL) on 1 August 1949. The results of this survey indicated that residual levels of contamination, ranging from 6000 dpm – to 30,000 dpm, existed in several areas used in support of MED operations. No documentation has been found indicating that a clean-up of these areas was performed at the conclusion of MED activities. Argonne National Lab (ANL) performed a document search in April 2005 that did not reveal any additional documentation relating to any decontamination activities (USACE, 2005).

Oak Ridge National Labs (ORNL) performed a second survey on 23 October 1976 to assess the radiological status of the site. This survey was limited in scope. A walkthrough of the areas associated with MED activities was completed using hand held radiological instrumentation. ORNL's finding identified a few isolated areas showing traces of alpha and beta-gamma radiation. In general, however, ORNL concluded that there was no surface contamination present and that results of the measurements were indistinguishable from background. The DOE, based on the results of this survey, concluded that no potential existed for significant amounts of residual radioactive material derived from MED existed at the site.

In February and March of 2004, Radiation Safety Services Incorporated (RSSI), performed a limited radiological survey for Valbruna Steel. This survey was performed with the help of current employee's knowledge of MED operations. The survey encompassed areas that were previously identified as having been used during MED operations. RSSI performed direct instrument surveys, bulk sampling, borehole investigations, and soil sampling. Based on the results of this survey RSSI concluded that contaminated areas still remained at the former Joslyn Manufacturing Site (USACE, 2005).

In January 2005, Science Applications International Corporation (SAIC) performed a focused radiological survey of the center portion of building 9 and an assessment of potential personnel exposure to residual radioactive contamination at the request of the site owner, Fort Wayne Steel. The North-South bay contains fixed equipment (installed post-MED activities) that the owner wishes to utilize and is an area where fixed contamination was previously identified. SAIC performed direct instrument surveys for alpha and beta contamination, removable alpha and beta contamination surveys, and gamma exposure rate assessments using hand held meters. The survey identified six additional areas of fixed contamination on columns and beams. SAIC performed the exposure assessment using RESRAD-BUILD version 3.22. SAIC concluded that the exposure to an equipment operator would be negligible (USACE, 2005).

3.0 FIELD ACTIVITIES AND ANALYTICAL PROTOCOL

The sampling activities performed at the former Joslyn Manufacturing Co. were accomplished in two phases. Phase 1 was completed by USACE and was focused on obtaining ground water samples from the site. Field work for phase 1 was performed by USACE from 24 July 2006 to 1 August 2006. Phase 2 was completed under an existing Architect and Engineer (A-E) contract (W912P4-05-D-0002) and focused on obtaining soil samples from the site. Field work for phase 2 was performed from 31 July 2006 to 3 August 2006.

3.1 Sample Locations

Sample locations for phases 1 and 2 were chosen on the basis of historical knowledge of the work performed by the former Joslyn Manufacturing Co. under Subcontract Number 7401-37-9 and previous radiological surveys described in section 2.4 of this report.

3.1.1 Ground Water Samples

Ground water was collected at the former Joslyn Manufacturing Site for constituents related to MED operations per the USACE in-house GW FSP dated June 2006. The ground water sampling approach was based on location of known and suspected radiologically impacted areas involving milling of uranium billets. Since no raw materials or ore was handled at the site sample analysis was limited to uranium. Thorium was not analyzed due to the fact that the only source of thorium would be from in-growth from the uranium relative to MED related activities and would not be considered significant after only 50-60 years. Several up gradient and down gradient wells locations were included to ensure site coverage and representative background conditions were assessed. No new monitoring wells were installed on-site as the site already contained numerous pre-existing monitoring wells. A total of 21 wells were sampled, of which 4 locations were used as background locations. All ground water sampling was conducted using low-flow techniques in accordance with USACE guidance (EM-1110-1-4000, Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites). Ground water was collected, packaged and sent by USACE-Buffalo District personnel to Severn Trent Laboratories – St. Louis. Table 1 reports both the filtered and unfiltered ground water results. Figure 3 depicts the groundwater sampling locations; groundwater generally flows easterly towards the St. Marys River.

3.1.2 Surface Water Samples

The Joslyn Site is relatively flat-lying with topographic variation caused by the industrial grading of the property, storage piles of building demolition debris, a circumferential levee system, and elevated railroad beds. The site essentially sits in a topographic low surrounded by up to 10-feet high, man-made features designed to protect the site from flooding in the Junk Ditch and the St. Marys River channels. The site does not appear to have an active storm water control system or permitted discharge points to the local riverine system. Observations and anecdotal evidence provided by the site owner, as well as site conditions observed by USACE personnel during field mobilization, indicate that precipitation ponds in low areas throughout the site, where evaporation and infiltration alleviate the ponding. A flood in the early 1980s

inundated the site with four feet of water and led to the construction of the levee and flood control system.

No on-site drainage ditches or storm water transmission basins/lines appear to exist on the site, which indicates that Junk Ditch and the St. Marys River currently do not receive site runoff. The site owner states that this condition has been allowed to occur, which limits the likelihood of contaminants derived from U of C contracts from migrating off site via the surface-water pathway. These site conditions and limited contaminant distributions protect the local surface water pathways (e.g., Junk Ditch and the St. Marys River) from potentially contaminated site discharges and maintain near-surface contamination near the source(s). Consequently, the limited SI resources were focused on on-site pathways that would provide the maximum exposure to site contaminants if the transport did occur (e.g., site soil exposure to workers and potential contamination of sensitive groundwater resources). The lack of groundwater contamination and the localized near-surface soil contamination indicates that off-site migration has not occurred or possibly negligible. Therefore no surface water or sediment samples were taken during this SI.

3.1.3 Soil Samples

A total of 24 soil sample (10 exterior to the bldg. complex and 14 interior) locations were identified for this SI, excluding background samples. Samples were collected using a Geoprobe^{R} direct push methods and advanced to a depth of 10 feet in all locations except where a refusal was encountered. Soil samples were located in areas of known or suspected radiologically impacted areas. Figure 4 and Figure 5 depict the soil sample locations and background sample locations respectively. Three sample locations GP12, GP14, and GP20 (Figure 4) were unable to be collected due to refusal encountered by the drill rig and were not relocated. Soil samples were collected by EarthTech packaged and sent to Severn Trent Laboratories – St. Louis per the USACE approved QAPP dated August 2006. Gross radiological measurements were made with field instrumentation along the length of each soil core with a Ludlum Model 44-9 Pancake G-M detector to delineate intervals of radioactivity above background readings, which were then sampled from the Geoprobe^{R} core.

3.2 Analytical

3.2.1 Analytical Laboratory

The laboratory (Severn Trent Laboratories (STL) – St. Louis) procedures utilized are based on the DOE Environmental Measurements Laboratory (EML) Health and Safety Laboratory (HASL) and United States Environmental Protection Agency (USEPA) SW-846 methodologies. Samples were analyzed following guidance in the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP). The analyses performed included isotopic uranium and isotopic thorium (on selected samples). Severn Trent Laboratories laboratory practices are consentient with the USACE requirements of National Environmental Laboratory Accreditation Program (NELAP) accreditation and compliance with the Department of Defense Quality Systems Manual (DOD QSM).

3.2.2 Soil Samples

Soil samples were analyzed for isotopic uranium and isotopic thorium by alpha spectroscopy with reporting limits (RL) for the target uranium isotopes (U-234, U-235/236, and U-238) of 0.1 pCi/g and the RL for the target thorium isotopes (Th-228, Th-230, and Th-232) of 0.1 pCi/g. A total of 12 field samples or 50% of the field samples were analyzed for thorium along with 100% of all background samples. The RL's used by the contract lab are based on the QAPP DQO screening values that are in accordance with NUREG -1757 Vol. 1, Rev. 2 and dose limit of 25 mrem/yr (10 CFR 20.1402).

3.2.3 Ground Water Samples

Samples were collected following the GW SI FSP developed by USACE-Buffalo District. The DQO for obtaining a total uranium analysis changed to isotopic uranium (alpha spec) for the purpose of determining background concentrations utilizing isotopic ratios. An addendum has been generated for the GW SI FSP. Reporting limits are based on being below the preliminary remediation goals for groundwater, based on radiological risk and dose (protection of human health).

4.0 QUALITY ASSURANCE/QUALITY CONTROL

4.1 QA/QC Summary

4.1.1 Ground Water Samples

Quality control samples used for the ground water sampling effort included three field duplicate samples (QC-sent to same lab for analysis) and two quality assurance (QA –sent to a USACE approved lab –Paragon, Fort Collins, CO) splits for Iso-Uranium two water (filtered and unfiltered) for field quality control purposes, as well as two sets of matrix-spike/matrix-spike duplicates (MS/MSD) for laboratory quality control purposes.

4.1.2 Soil Samples

As specified in the quality assurance project plan (QAPP) for the soil sampling effort, field duplicates were collected at a frequency of 20% of the field samples analyzed for isotopic uranium and thorium. For the 29 field samples collected for uranium analysis (24 site samples and 5 background samples) six field duplicates were collected and analyzed. For the 17 samples (12 site samples and 5 background samples) analyzed for isotopic thorium four field duplicates were collected and analyzed.

4.1.3 Chemical Quality Assurance Report

The QA split results (QA laboratory: Paragon) were compared to the primary lab (STL) results for consistency and comparability. There were no major data discrepancies noted in the comparison of the QA and primary sample results.

Duplicate comparison of the primary and field split (QC) samples, sent to STL, found one minor data discrepancy for U-235 in a soil sample. Table 4-1 Criteria for comparing QC and QA Sample Data (EM 200-1-6) was utilized for, this purpose. The Chemical Quality Assurance Reports (CQARs) in Appendix A show data comparisons support the acceptability of the project data.

4.2 Data Validation Summary

All of the data for both the phase 1 and phase 2 sampling efforts was reviewed and validated by USACE Buffalo District using validation procedures based on Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) guidance. Based on the data validation effort it was determined that all data was qualified and acceptable for its intended purpose, no data was rejected, see Data Validation, Appendix B.

5.0 MIGRATION/EXPOSURE PATHWAYS AND TARGETS

5.1 Ground Water Migration Pathway

5.1.1 Local Geology and Hydrologic Setting

The Joslyn Site is within the City of Fort Wayne, Indiana and lies southwest of the confluence of Junk Ditch with the St. Marys River within their 100-year floodplains. Topography is relatively flat, with a slope of less than 0.5% toward the northeast. The elevation at the site ranges from approximately 755 feet above mean sea level (amsl) throughout most of the site to approximately 750 feet amsl along Junk Ditch. The railroad tracks adjacent to the site are elevated to approximately 760 ft amsl.

The Joslyn Site is located on the Bluffton Till Plain region of the Central Till Plain physiographic province of Indiana, which is a poorly drained upland, interrupted by incised stream and river valleys. The SSURGO Soil Survey of Allen County, Indiana (USDA, 1980) classifies site soils as the Lenawee silty clay loam. This two- to three-foot thick lacustrine derived soil can contain up to 50% clay, which develops into a poorly drained soil of moderately low permeability (<1E-3 cm/s) with high water capacity (up to 10 inches in top 60 inches) and organic matter (3% to 6%). This soil appears commonly buried under fill material installed for grading and leveling the industrial property.

The regional setting is underlain by up to 80 feet of Pleistocene glacial tills, coarse-grained glaciofluvial deposits, alluvial sediments, glaciolacustrine sediments, and recent floodplain and channel deposits of local rivers. The site and nearby properties are underlain by up to 70 feet of variably textured sand and gravel deposits interrupted by discontinuous clay layers that together overly the Trafalgar Till (a heterogeneous and poorly sorted diamict). This till unconformably overlies the upper Devonian Traverse Formation of the Muscatatuck Group, which consists of a variety of groundwater producing limestones, dolomite, and thin shale beds. The Traverse Formation exhibits a weathered erosional surface at the glacial overburden contact.

For further information, see the Indiana Geologic Survey at:
(http://igs.indiana.edu/geology/structure/compendium/html/comp4z6s.cfm).

The sand and gravel deposits underlying the Joslyn site are interrupted by one- to fifteen-foot thick clay layers in the western part of the site, which pinch out to the east where undifferentiated outwash deposits dominate the subsurface of the St. Marys River floodway.

The coarse-grained glaciofluvial deposits above the Trafalgar Till constitute the primary water-bearing unit in the unconsolidated portion of the subsurface. The unconsolidated deposits below the Joslyn Site vertically grade from a silty or clayey sand (or silt) with fill (3-10 ft. thick) to a poorly sorted silty sand, and then to a thicker package of poorly to well sorted layers of sand that grade to well sorted gravel towards the east and northeast. These coarser-grained units are known collectively as the unconsolidated Atherton Formation, which is a regionally sensitive groundwater resource.

5.1.2 Releases and Potential Releases to Ground Water

The former Joslyn Manufacturing site, as mentioned before, is located in an urban setting in the City of Ft. Wayne which is located in Allen County Indiana. Of the thirty seven (37) wells within a mile of the site, IDNR databases indicate twenty one (21) are dewatering or industrial use (19), ten (10) are home drinking water wells, and six (6) do not have definitive data to determine use. Half of the home drinking water wells are pre-1970 installations. Most dewatering wells appear available for inspection although current disposition is unknown. Medium- to low-quality documentation exists for these wells.

Approximately 24% of Allen County residents use groundwater resources as primary water supplies, which equates to about 80,000 people (Purdue University Cooperative Extension Service, J.R. Frankenberger, February 2002). About 15% rely on private wells and the remaining 9% are on public supplies derived from groundwater. Indiana maintains a wellhead-protection database and on-line data mapping system, which indicates the Joslyn Manufacturing Site, is not within a regulated wellhead protection zone. Although there are several groundwater wells within the vicinity of the site, the area is urban in nature and drinking water is supplied by the City of Fort Wayne, Water and Sewer Department. Municipal water is obtained from the St. Joseph River north of Fort Wayne (Cedar Creek watershed as primary source) at a rate of about 34 million gallons per day for over 75,500 customers.

5.1.3 Ground Water Migration Pathway Targets

As noted above the primary source of drinking water in the City of Ft. Wayne is from municipal water obtained from the St. Joesph's River. It is anticipated that very little if any ground water is used in the surrounding area for either drinking water or recreational purposes. In addition to these facts the current site owner has completed a voluntary ground water remediation program to extract trichloroethene (TCE) source area from site ground water. Several metals plumes are collocated with the TCE plume, which further precludes the use of groundwater on site for human consumption. Well couplets that were installed and sampled by the site owner for organic and metals contamination indicate that their off-site and down-gradient

metals contamination remains in the upper portion of the aquifer (i.e., shows little vertical dispersion) and would discharge to the St. Mary's River and therefore be hydraulically separated from the regions water supply.

5.1.4 Sample Locations

Ground water was sampled from a pre-existing wells established at the former Joslyn Manufacturing site. Figure 3 depicts the 17 sample locations, along with 2 background locations, one (1) cross-gradient well included as background, and one (1) up-gradient well included as background.

5.1.5 Ground Water Migration Pathway Analytical Results

The field parameter data for the phase 1, ground water sampling effort, are listed in Table 3. This data shows the variability of the regional geochemistry and influences and influences from the Joslyn site organic contamination remedial measure. The electro-catalytic heating resulted in geochemical changes of the groundwater (e.g., elevated temperature, conductance and pH) in several wells.

Background data are listed in Table 2 with descriptive statistics indicating ranges of expected mean values (confidence limits). The data indicate that the Joslyn area contains minor amounts of natural uranium in ground water flowing in regional glacial sediments. Ground water sampling results from the four background/up gradient wells are summarized below:

- Uranium-234: Data range = 0.12 to 1.27 pCi/L, averaging 0.40 pCi/L;
- Uranium-235: Data range = 0.00 to 0.08 pCi/L, averaging 0.02 pCi/L; and
- Uranium-238: Data range = 0.08 to 1.38 pCi/L, averaging 0.41 pCi/L.

The results of the site data are listed in Table 1 with descriptive statistics indicating ranges of expected mean values. Ground water sampling results from the 17 site wells are summarized below:

- Uranium-234: Data range = 0.01 to 2.52 pCi/l, averaging 0.67 pCi/L;
- Uranium-235: Data range = 0.01 to 0.16 pCi/l, averaging 0.03 pCi/L; and
- Uranium-238: Data range = 0.00 to 2.06 pCi/l, averaging 0.63 pCi/L.

5.1.6 Ground Water Migration Pathway Conclusions

Although the site groundwater does not serve as a source of drinking water, concentrations of radiological constituents measured in groundwater were screened against concentrations protective of drinking water. This is done as a conservative measure in order to determine whether or not there has been a release to the environment of radiological constituents. Results from the groundwater sampling event were compared to the background dataset, the EPA Maximum Contaminant Level (MCL) of 30 micrograms per liter (µg/L), and the EPA Region IX Preliminary Remediation Goals (PRG) for tap water of 7.3 µg/L for total (mass) uranium. The

isotopic U values in pCi/L were converted to mass-equivalent uranium values (µg/L) by using the published specific activity of the uranium isotopes. Based on the results the Phase I groundwater collection, a release of uranium to site groundwater does not appear to have occurred.

5.2 Soil Exposure Pathway

5.2.1 Physical Source Access Conditions

The site itself has been developed after the cessation of U of C contracted operations with the addition of new buildings and additions to existing buildings used during U-billet shaping operations. The majority of the site is covered by either concrete or asphalt with very little accessible vegetation. The floors of most of the buildings used during contracted operations are a mixture of concrete and stone.

As noted in the PA (USACE, 2005) the site is currently owned by the Fort Wayne Steel Corporation a subsidiary of Valbruna Steel. Currently, Fort Wayne Steel Corp allows limited access to the areas that have been previously identified with radiological contamination by RSSI. Access is typically limited to the Site Safety and Health officer, plant manager, and security personnel. Only portions of the North-South Bay (Building 9, Figure 2) is used regularly by site personnel. The North-South bay contains fixed equipment (installed post-MED activities) and a storage and shipping department that the owner utilizes in support of operations conducted by Valbruna.

5.2.2 Actual or Potential Contamination Areas

Soil contamination identified during the RSSI survey in 2004 was at a depth of 4 to 8 feet below concrete located in bldg 8 on Figure 4. Elevated samples taken during the phase 2 soil sampling effort performed in 2006 are located in one of the suspected burn areas (labeled Old Burn Area III on Figure 4) at a depth of 0 to 1.5 feet in soil like material.

Additional areas of radiological contamination were also identified by the RSSI report in 2004 that consisted of bulk sampling and direct measurement that were primarily located in bldg. 8 and are further detailed in the USACE PA report dated October 2005.

5.2.3 Soil Exposure Targets

As noted in section 5.2.1 of this report there is limited access to areas where soil contamination is present by either physical means (i.e. concrete and fences) or by administrative means. The likelihood of exposure to terrestrial receptor is low due to the urban setting of the site. Despite the limited access to potentially contaminated soils, for the purposes of this site inspection, it was assumed that incidental soil ingestion, inhalation of fugitive dust, and exposure to external gamma rays are complete exposure pathways for site workers.

5.2.4 Sample Locations

Sample locations, to include background sample locations are indicated in Figures 4 and 5 respectively.

5.2.5 Soil Exposure Analytical Results

The phase 2, soil sampling, data is presented in Table 4. The soil sampling results for the phase 2 sampling effort are summarized below:

- Uranium-234: Data range = 1.27 to 1720 pCi/g, averaging 77.34 pCi/g;
- Uranium-235/236: Data range = 0.025 to 71 pCi/g, averaging 3.261 pCi/g; and
- Uranium-238: Data range = 1.31 to 1780 pCi/g, averaging 79.86 pCi/g.

- Thorium-228: Data range = 0.44 to 1.16 pCi/g, averaging 0.84 pCi/g;
- Thorium-230: Data range = 1.55 to 2.53 pCi/g, averaging 2.01 pCi/g; and
- Thorium-232: Data range = 0.62 to 1.42 pCi/g, averaging 0.92 pCi/g.

Background data is listed in Table 4 with descriptive statistics indicating ranges of expected mean values. Background data is summarized below:

- Uranium-234: Data range = 1.16 to 1.65 pCi/g, averaging 1.39 pCi/g;
- Uranium-235/236: Data range = 0.03 to 0.087 pCi/g, averaging 0.062 pCi/g; and
- Uranium-238: Data range = 1.09 to 1.92 pCi/g, averaging 1.45 pCi/g.

- Thorium-228: Data range = 0.64 to 1.19 pCi/g, averaging 0.88 pCi/g;
- Thorium-230: Data range = 1.57 to 2.43 pCi/g, averaging 1.88 pCi/g; and
- Thorium-232: Data range = 0.65 to 1.30 pCi/g, averaging 0.83 pCi/g.

The RSSI survey in 2004 indicated that there was contamination at a depth of 4 to 8 feet in boreholes located in bldg. 8. During the SI phase 2 sampling these results could not be replicated in the vicinity of the boreholes in bldg. 8.

5.2.6 Soil Exposure Conclusions

The results of the soil sampling were compared to generic screening levels in order to provide a conservative, simplified evaluation to determine if contamination associated with the Nation's early atomic energy program at the site poses a potential unacceptable risk. Surface soil screening levels have been developed by the Nuclear Regulatory Commission (NRC) to determine compliance with decommissioning and license termination under 10 CFR 20. Although the Joslyn site does not currently hold an NRC license, comparison to these conservative screening levels (documented in NUREG 1757) provide an estimate of whether or not a release to the environment of radiological constituents has occurred. These screening levels were developed using a conservative, subsistence farmer scenario, to meet a dose limit of 25 mrem/year above background, and assume that the exposure pathways listed in Section 5.2.3, as well as ingestion of contaminated water and foodstuffs are complete exposure pathways.

The data indicate that there are areas within the former Joslyn Steel Manufacturing site that are adversely impacted with isotopic uranium from work contracted under Subcontract Number 7401-37-9 with the University of Chicago (U of C). The three highest isotopic uranium concentrations were reported in samples collected from one of the suspected burn pit areas (labeled Old Burn Pit Area III on Figure 4), an exterior area located north of Bldg 8 and east of Bldg. 9 and constitute a release to the environment under CERCLA guidelines. These values were in excess of the NUREG-1757 screening values for uranium 234, 235/236, and 238 which would be in compliance with the 25 mrem/yr unrestricted release dose limit found in 10 CFR 20.1402.

Three sample locations, GP01, GP03, and GP04 (Figure 4), exhibited elevated results for uranium relative to the values found in NUREG-1757. In accordance with NUREG-1757 the screening values for soils are 13.0 pCi/g for uranium-234, 8 pCi/g for uranium-235, and 14 pCi/g for uranium-238. The maximum concentration for uranium in site soils (sample GP01) is over 100 times the soil screening values listed in NUREG-1757.

The isotopic thorium results for soil are below the NUREG-1757 screening values listed once background is considered. The screening level values found in NUREG-1757 for thorium-228 is 4.7 pCi/g, 1.8 pCi/g for thorium-230, and 1.1 pCi/g for thorium-232.

In addition to the data collected by USACE in 2006 the RSSI data indicated that there are elevated concentrations of uranium 235 and 238 present in Bldg. 8 at a depth of 4-8 feet in a small localized area. However, these results were not able to be reproduced during the USACE sampling effort that had biased samples in the same area at similar depths of the RSSI survey in 2004.

Isotopic uranium concentrations were lower in all the other potentially contaminated areas sampled by USACE in 2006 and were below the NUREG-1757 interim screening values except for those areas indicated above. The remainder of the data results for uranium-234 and uranium-238 were less than 4 pCi/g and less than 0.2 pCi/g for uranium-235/236. The highest isotopic thorium result was seen in the area of the highest isotopic uranium results in the area labeled the Old Burn Pit Area III on Figure 4. As seen in section 5.2.5, the values for all three thorium isotopes are very similar to the values observed in the background samples.

5.3 Air Migration Pathway

5.3.1 Climate

The local climate is influenced by Lake Michigan and to a lesser extent Lake Erie. Temperature differences between daily highs and lows average about 20 degrees Fahrenheit. Annual precipitation is well distributed throughout the year with somewhat larger amounts occurring in late spring and early summer. Prevailing wind for the area is typically out of the southwest at 10 miles per hour (mph).

5.3.2 Releases and Potential Releases to the Air

Potential air pathway receptors from residual radioactivity at the former Joslyn Manufacturing Site include employees currently working in the former buildings used by the Joslyn Manufacturing site as indicated in section 5.2.1 of this report. As indicated previously the site is located in an industrial setting surrounded by other commercial and industrial properties, residential and recreational land uses. Previous sampling conducted by RSSI in 2004, indicated that there was limited removable contamination present on building surfaces however, it was below release criteria established in AR 11-9, The Army Radiation Safety Program.

5.3.3 Air Migration Pathway Conclusions

The potential for the air migration pathway release of radionuclides associated with the U of C activities on the site is low. While the depth of the three elevated samples collected in the Old Burn Area III ranged from 0 to 1.5 feet below ground surface the sample locations in themselves are located in area that is restricted by the current site owner that would preclude dust generating activities. Despite the limited access to potentially contaminated soils, for the purposes of this site inspection, it was assumed that incidental soil ingestion, inhalation of fugitive dust, and exposure to external gamma rays are complete exposure pathways for site workers.

As mentioned in the PA completed in 2005 by USACE, there is fixed contamination present in some of the buildings that were used in U-billet shaping operations and is not a hazard with the present site conditions and use of the buildings.

5.4 Surface Water Pathways

The Joslyn Site is relatively flat-lying with topographic variation caused by the industrial grading of the property, storage piles of building demolition debris, a circumferential levee system, and elevated railroad beds. The site essentially sits in a topographic low surrounded by up to 10-feet high, man-made features designed to protect the site from flooding in the Junk Ditch and the St. Marys River channels. The site does not appear to have an active storm water control system or permitted discharge points to the local riverine system. Observations and anecdotal evidence provided by the site owner, as well as site conditions observed by USACE personnel during field mobilization, indicate that precipitation ponds in low areas throughout the site, where evaporation and infiltration alleviate the ponding. A flood in the early 1980s inundated the site with four feet of water and led to the construction of the levee and flood control system.

No on-site drainage ditches or storm water transmission basins/lines appear to exist on the site, which indicates that Junk Ditch and the St. Marys River currently do not receive site runoff. The site owner states that this condition has been allowed to occur, which limits the likelihood of contaminants derived from U of C contracts from migrating off site via the surface-water pathway.

5.4.1 Surface Water Pathways Conclusion

These site conditions and limited contaminant distributions protect the local surface water pathways (e.g., Junk Ditch and the St. Marys River) from potentially contaminated site discharges and maintain near-surface contamination near the source(s). Consequently, the limited SI resources were focused on on-site pathways that would provide the maximum exposure to site contaminants if the transport did occur (e.g., site soil exposure to workers and potential contamination of sensitive groundwater resources). The lack of groundwater contamination and the localized near-surface soil contamination indicates that off-site migration has not occurred or is negligible.

6.0 SUMMARY AND CONCLUSIONS

There is the potential for on-site receptors (site visitors and workers) to have exposure to contamination in near-surface site soils via incidental ingestion of soils, inhalation of fugitive dust, and external gamma radiation. Levels of radionuclides in soils were compared to screening levels that were established to meet the unrestricted release dose limit of 25 mrem/year (10 CFR 20). Based on the results of the sampling conducted by the USACE in July and August 2006 it has been determined that there is a small localized area of radiological contamination above these conservative soil screening levels. The SI groundwater data does not indicate a release of radiological contaminants to the site and regional groundwater. However, sample results from the SI soil sampling effort indicate that there has been a release to the environment in a small localized area north of bldg 8 and east of bldg. 9. Therefore, it is recommended that further evaluation of the radiological contamination at the Joslyn Manufacturing site be conducted, by performing a remedial investigation of the site under the FUSRAP.

7.0 REFERNCES

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Earth Tech, 2006c. Radiological Analysis Report (Final). Prepared for USACE Buffalo District. September.

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USEPA, 2005. Federal Facilities Remedial Site Inspection Summary Guide. July.

United States Army Corps of Engineers (USACE), 2005. Preliminary Assessment Joslyn Manufacturing Site Fort Wayne, Indiana. August.

USACE, 2006. Groundwater Sampling Results – In-House Groundwater Sampling Under Site Investigation, Joslyn Manufacturing Site Fort Wayne, Indiana. December.

8.0 PHOTO LOG

Drill rig

Interior Bldg. 6 (electric furnace)

Product Storage Area

Sample taken in Lathe Area

Typical core recovery

Health Physics tech scanning core

re recovery

Core taken in location of RSSI survey
In Bldg. 8

Use of rock drill to penetrate concrete

IDW Containerized

Sample location G-16
Old Straightener Area

Sample G-26
Grinding Area

Typical core recovery

FIGURES

FIGURE 1
Site Location

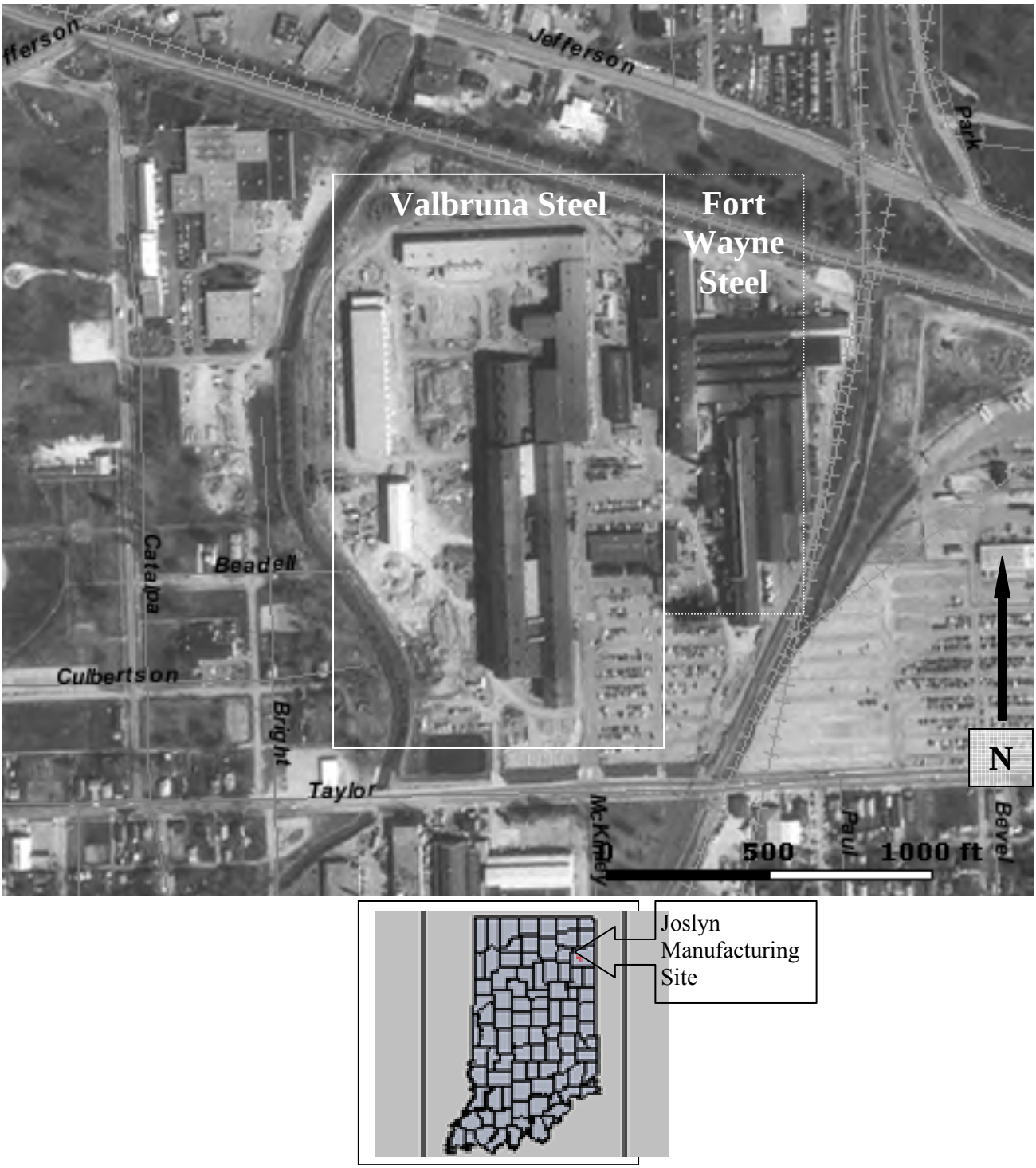
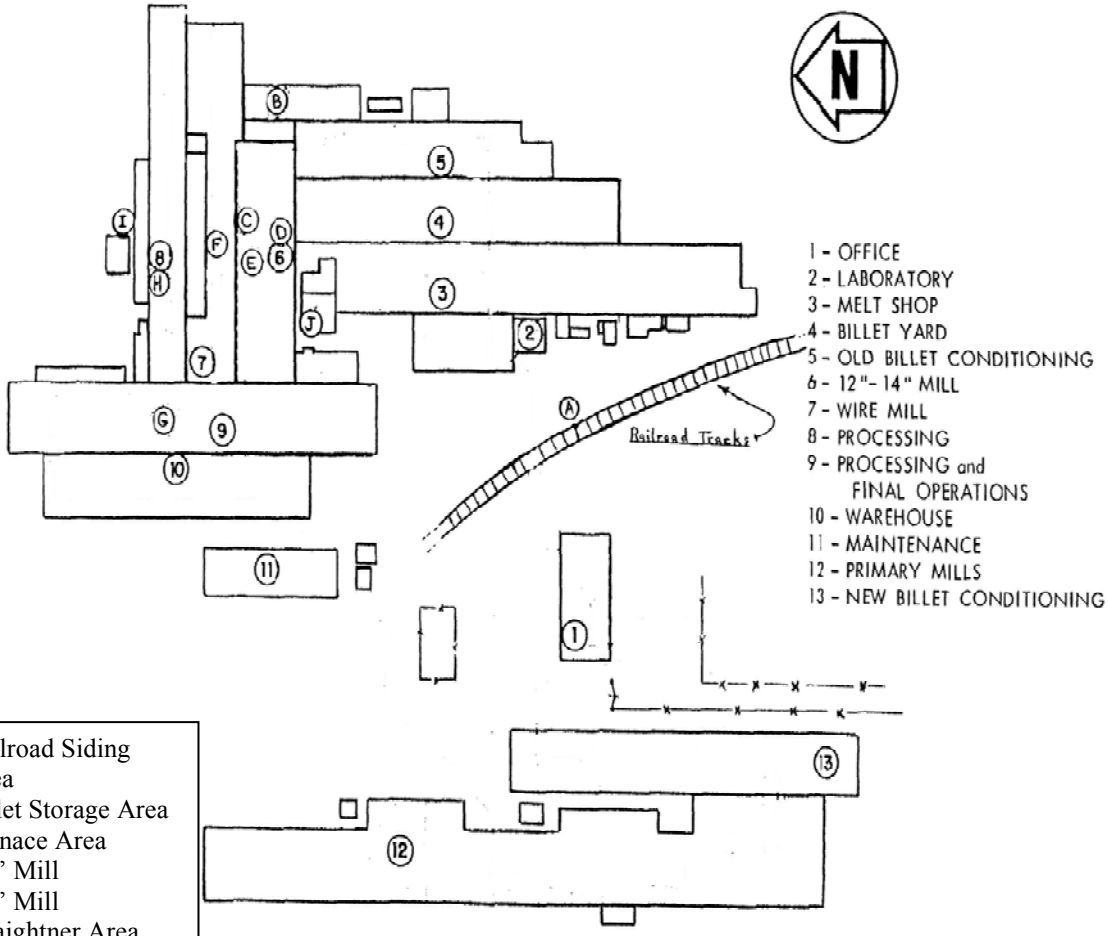


FIGURE 2
Plant Layout



A. Railroad Siding Area
B. Billet Storage Area
C. Furnace Area
D. 18'' Mill
E. 14'' Mill
F. Straightner Area
G. Abrasive Cutting Area
H. Production Grinding Area
I. Burn Area
J. Lathe Turning Area

FIGURE 3

Ground Water Sampling Locations

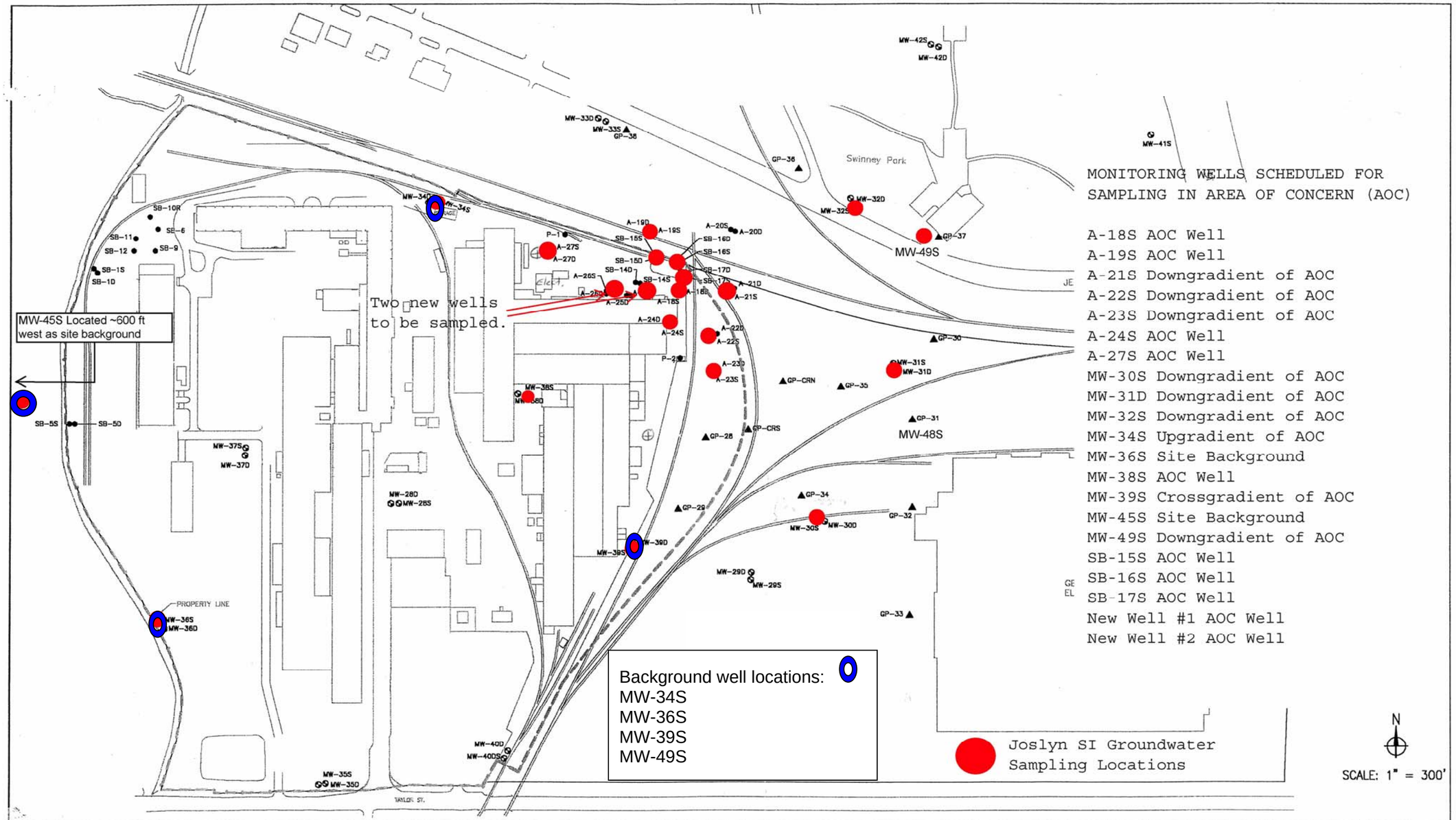


Figure 1. Joslyn SI Groundwater Sampling Locations

U.S. Army Corps of Engineers
Buffalo District
Joslyn Steel FUSRAP

FIGURE 4
Soil Sample Locations

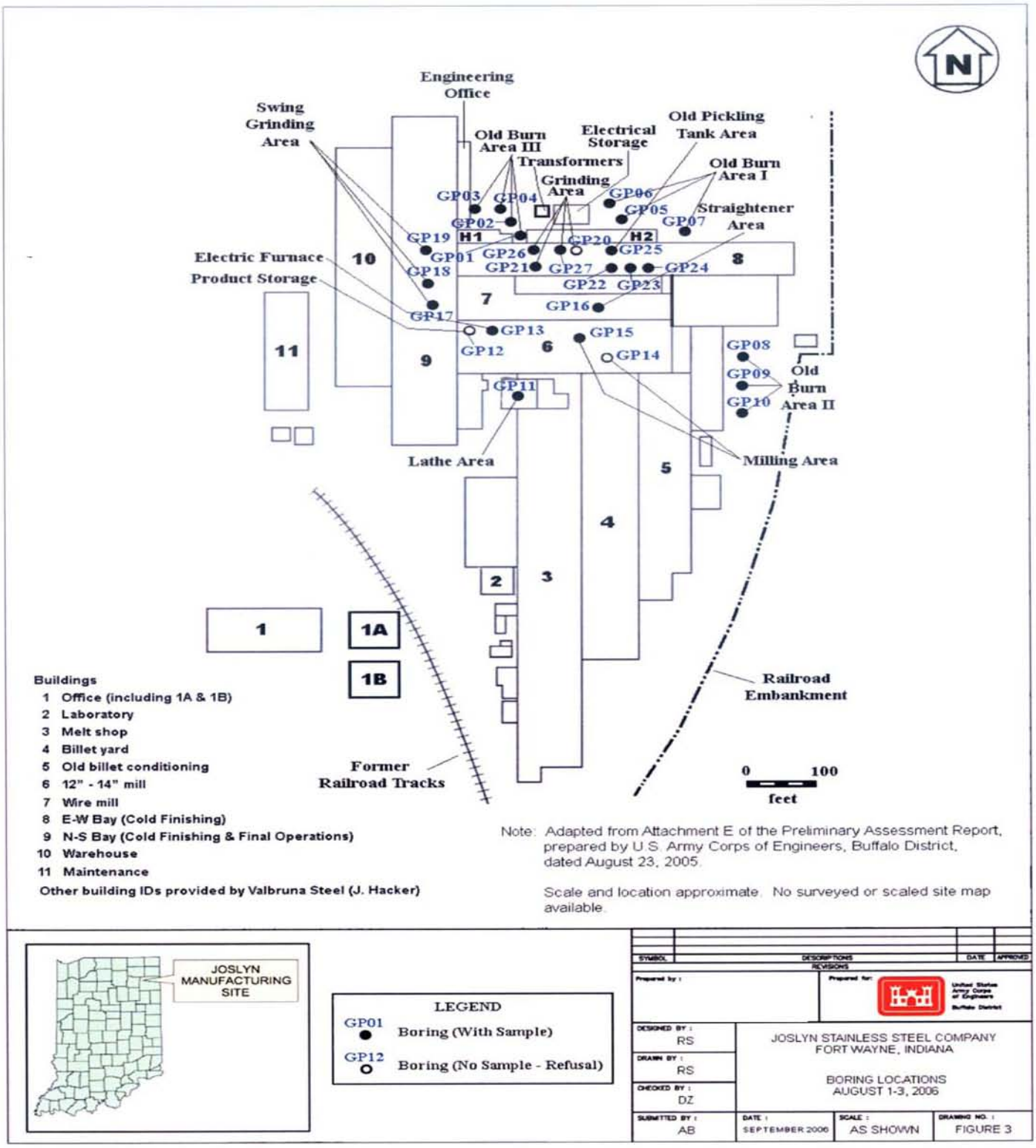
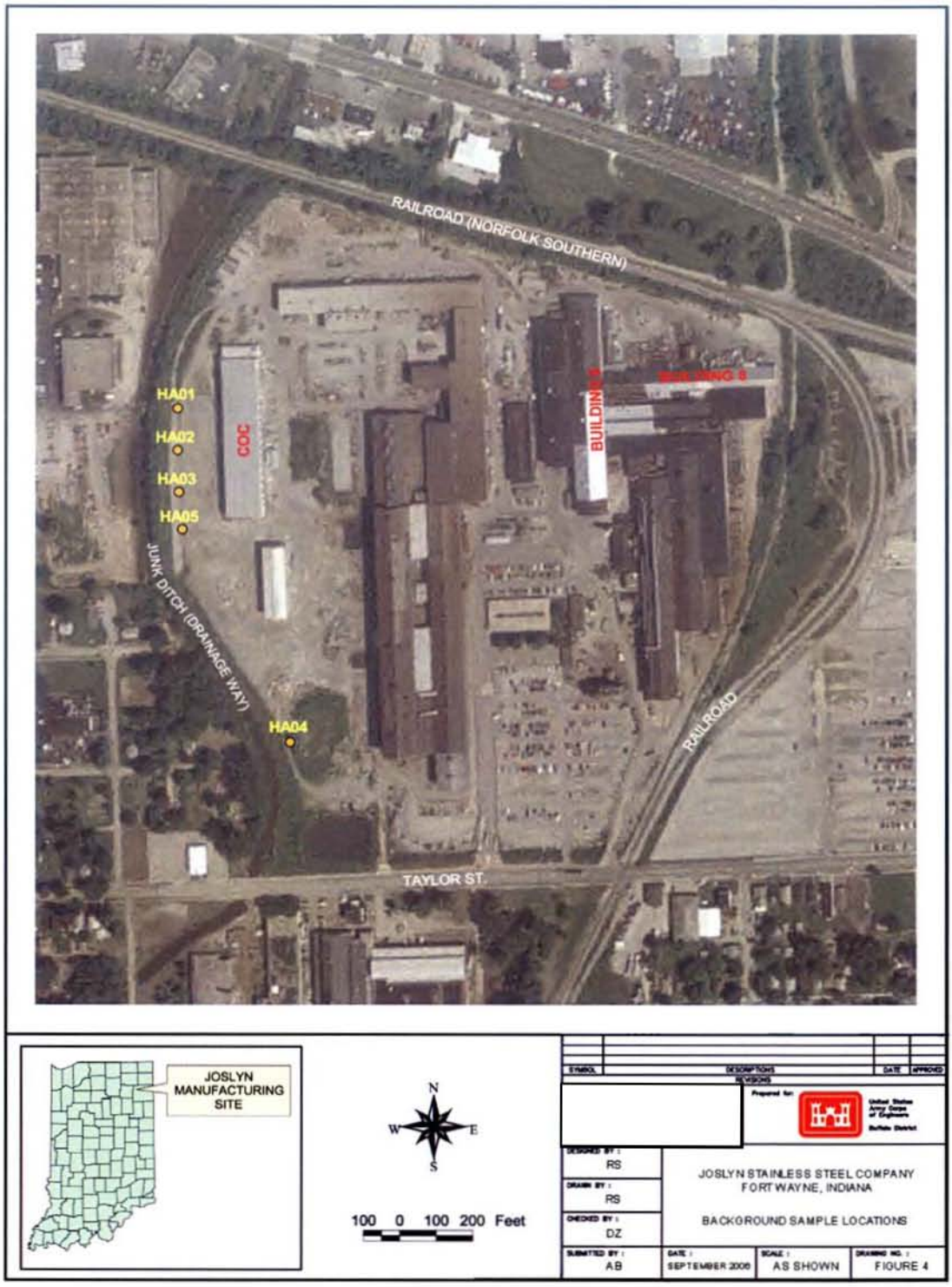


FIGURE 5
Background Soil Locations



TABLES

TABLE 1
Ground Water Sampling Results

Well ID	Sample Date	Uranium 233/234	Uranium 235/236	Uranium 238	Units
A-18S	27-Jul-06	0.99 +/- 0.26	0.02 +/- 0.043 U	1.21 +/- 0.3	pCi/L
A-18S-F	27-Jul-06	1.22 +/- 0.3	0.03 +/- 0.053 U	1.1 +/- 0.28	pCi/L
A-21S	29-Jul-06	1.02 +/- 0.26	0.077 +/- 0.068 J	0.98 +/- 0.25	pCi/L
A-21S-F	29-Jul-06	0.96 +/- 0.24	0.112 +/- 0.08	0.87 +/- 0.23	pCi/L
A-22S	28-Jul-06	0.95 +/- 0.24	0.05 +/- 0.056 U	0.96 +/- 0.24	pCi/L
A-22S-F	28-Jul-06	1.1 +/- 0.28	0.04 +/- 0.053 U	0.88 +/- 0.24	pCi/L
A-23S	28-Jul-06	1.21 +/- 0.29	0.053 +/- 0.06 U	1.35 +/- 0.32	pCi/L
A-23S-F	28-Jul-06	1.23 +/- 0.28	0.031 +/- 0.042 U	1.18 +/- 0.27	pCi/L
A-24S	27-Jul-06	0.5 +/- 0.21	0 +/- 0 U	0.39 +/- 0.18	pCi/L
A-24S-F	27-Jul-06	0.18 +/- 0.088	-0.006 +/- 0.028 U	0.209 +/- 0.094	pCi/L
A-27S	26-Jul-06	1.01 +/- 0.25	0.081 +/- 0.066 J	0.94 +/- 0.24	pCi/L
A-27S-F	26-Jul-06	0.87 +/- 0.21	0.039 +/- 0.053 U	0.76 +/- 0.19	pCi/L
DUP01 (A-27S)	26-Jul-06	0.84 +/- 0.21	0.074 +/- 0.061 J	0.95 +/- 0.22	pCi/L
DUP01-F (A-27S)	26-Jul-06	0.8 +/- 0.2	0.016 +/- 0.033 U	0.72 +/- 0.19	pCi/L
MW-15S	30-Jul-06	0.015 +/- 0.031 U	0 +/- 0 U	0.015 +/- 0.031 U	pCi/L
MW-15S-F	30-Jul-06	0.072 +/- 0.06 J	-0.003 +/- 0.028 U	0.025 +/- 0.037 U	pCi/L
MW-16S	26-Jul-06	-0.005 +/- 0.024 U	0.009 +/- 0.028 U	-0.002 +/- 0.03 U	pCi/L
MW-16S-F	26-Jul-06	0.018 +/- 0.043 U	-0.003 +/- 0.033 U	0.035 +/- 0.043 U	pCi/L
MW-17S	26-Jul-06	0.31 +/- 0.11	0.018 +/- 0.031 U	0.31 +/- 0.1	pCi/L
MW-17S-F	26-Jul-06	0.187 +/- 0.091	-0.006 +/- 0.028 U	0.29 +/- 0.11	pCi/L
MW-19S	29-Jul-06	1.12 +/- 0.28	0.081 +/- 0.073 J	1.4 +/- 0.33	pCi/L
MW-19S-F	29-Jul-06	1.11 +/- 0.27	0.084 +/- 0.068 J	1.14 +/- 0.27	pCi/L
MW-30S	31-Jul-06	0.56 +/- 0.16	0.011 +/- 0.037 U	0.36 +/- 0.13	pCi/L
MW-30S-F	31-Jul-06	0.45 +/- 0.14	0.008 +/- 0.024 U	0.33 +/- 0.12	pCi/L
MW-31D	31-Jul-06	0.03 +/- 0.044 U	-0.003 +/- 0.027 U	0.017 +/- 0.041 U	pCi/L
MW-31D-F	31-Jul-06	0 +/- 0 U	-0.009 +/- 0.032 U	0.017 +/- 0.029 U	pCi/L
MW-32S	29-Jul-06	0.68 +/- 0.18	0.074 +/- 0.061 J	0.67 +/- 0.18	pCi/L
MW-32S-F	29-Jul-06	0.54 +/- 0.16	0.024 +/- 0.042 U	0.73 +/- 0.19	pCi/L
MW-38S	27-Jul-06	0.059 +/- 0.056 U	0 +/- 0 U	0.077 +/- 0.057 J	pCi/L
MW-38S-F	27-Jul-06	0.097 +/- 0.07 J	0.003 +/- 0.031 U	0.081 +/- 0.058 J	pCi/L
MW-49S	29-Jul-06	0.108 +/- 0.064	0.008 +/- 0.024 U	0.199 +/- 0.089	pCi/L
MW-49S-F	29-Jul-06	0.202 +/- 0.088	0.01 +/- 0.028 U	0.15 +/- 0.073	pCi/L
NEW WELL #1	25-Jul-06	2.19 +/- 0.42	0.066 +/- 0.059 J	2.06 +/- 0.4	pCi/L
NEW WELL #1-F	25-Jul-06	2.52 +/- 0.47	0.157 +/- 0.089	1.78 +/- 0.36	pCi/L
NEW WELL #2	25-Jul-06	0.021 +/- 0.028 U	-0.002 +/- 0.021 U	0.006 +/- 0.017 U	pCi/L
NEW WELL #2-F	25-Jul-06	0.038 +/- 0.04 U	0.008 +/- 0.024 U	0 +/- 0 U	pCi/L

Maximum:	2.52	0.16	2.06
Minimum:	-0.01	-0.01	0.00
Arithmetic Mean:	0.67	0.03	0.63
Geometric Mean:	--	--	--
Standard Deviation:	0.60	0.04	0.54
95% UCL: @	0.87	0.04	0.80
95% LCL: @	0.48	0.02	0.46

Notes:
"F" Designates Field Filtered Sample; "D" Designates Field Duplicate Sample (Except for MW-31D).
@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, respectively.

TABLE 2
Background Well Data

Well ID #	Sample Date	Uranium 233/234	Uranium 235/236	Uranium 238	Units
MW-34S	28-Jul-06	1.16 +/- 0.26	0.038 +/- 0.042 U	1.38 +/- 0.29	pCi/L
MW-34S-F	28-Jul-06	1.27 +/- 0.29	0.081 +/- 0.067 J	1.29 +/- 0.29	pCi/L
MW-36S	28-Jul-06	0.118 +/- 0.07	-0.003 +/- 0.025 U	0.075 +/- 0.056 J	pCi/L
MW-36S-F	28-Jul-06	0.174 +/- 0.088	0.011 +/- 0.031 U	0.129 +/- 0.073	pCi/L
MW-39S	27-Jul-06	0.211 +/- 0.097	0.024 +/- 0.042 U	0.211 +/- 0.096	pCi/L
MW-39S-F	27-Jul-06	0.29 +/- 0.11	0.029 +/- 0.038 U	0.167 +/- 0.08	pCi/L
MW-45S	30-Jul-06	0.147 +/- 0.074	0.002 +/- 0.025 U	0.206 +/- 0.085	pCi/L
MW-45S-D	30-Jul-06	0.194 +/- 0.089	0.011 +/- 0.031 U	0.194 +/- 0.089	pCi/L
MW-45S-F	30-Jul-06	0.205 +/- 0.096	0.009 +/- 0.026 U	0.23 +/- 0.1	pCi/L
MW-45S-F-D	30-Jul-06	0.27 +/- 0.11	0.011 +/- 0.032 U	0.195 +/- 0.094	pCi/L

Data Values:	10	10	10
Maximum:	1.27	0.08	1.38
Minimum:	0.12	0.00	0.08
Arithmetic Mean:	0.40	0.02	0.41
Geometric Mean:	0.28	--	0.25
Standard Deviation:	0.43	0.02	0.49
95% UCL: @	0.67	0.04	0.71
95% LCL: @	0.14	0.01	0.10

NOTES:
 # "F" Designates Field Filetered Sample; "D" Designates Field Duplicate Sample.
@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, Respectively.

TABLE 3
Ground Water Field Data

Well ID	Collect Date	Collect Time	Sampler	Temperature (F)	Specific Conductance (uS/cm)	pH (std. unit)	ORP (mV)	Corrected Eh (mV) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Purge Volume (liters)	Purge Rate (mL/min)	Comments #
A-18S	27-Jul-06	1045	JMR/WTF	67.60	3002.00	5.76	98	297	0.22	6.3	0.0	92	AOC Well
A-24S	27-Jul-06	1050	MG	73.00	886.20	5.29	274	473	0.25	13.0	0.0	46	AOC Well
A-27S	26-Jul-06	1440	JMR	73.20	721.50	6.72	171	370	0.23	4.8	0.0	82	AOC Well
MW-15S	29-Jul-06	1135	JMR	84.10	1599.00	5.89	3	202	0.18	21.0	0.0	92	AOC Well
MW-16S	26-Jul-06	1115	MG	70.70	1019.00	5.91	-19	180	0.19	3.7	0.0	96	AOC Well
MW-17S	26-Jul-06	1105	JMR	71.50	1017.00	5.74	199	398	0.24	0.9	0.0	96	AOC Well
MW-19S	29-Jul-06	1040	JMR	70.50	2188.00	5.85	163	362	0.62	7.9	0.0	96	AOC Well
MW-38S	27-Jul-06	1635	JMR	71.60	1080.00	6.95	-97	102	0.21	379.7	0.0	96	AOC Well
A-21S	29-Jul-06	1100	WTF/MG	75.30	1834.00	6.31	200	399	0.21	77.0	0.0	90	Downgradient of AOC
A-22S	28-Jul-06	1540	MG	69.40	3142.00	6.10	19	218	0.36	21.0	0.0	68	Downgradient of AOC
A-23S	28-Jul-06	1530	JMR	74.60	3620.00	6.19	86	285	0.22	158.6	0.0	92	Downgradient of AOC
MW-30S	31-Jul-06	1200	WTF	82.60	1634.00	6.80	-86	113	0.16	10.8	0.0	96	Downgradient of AOC
MW-31D	31-Jul-06	1125	MG/WTF	82.80	901.10	6.83	-132	67	0.13	7.5	0.0	92	Downgradient of AOC
MW-32S	29-Jul-06	1435	JMR	78.20	735.70	6.75	163	362	0.38	11	0	92	Downgradient of AOC
MW-49S	29-Jul-06	1430	MG	74.20	877.50	6.54	5	204	0.38	15.2	0.0	50	Downgradient of AOC
NEW WELL #1	25-Jul-06	1625	MG	91.20	3609.00	6.19	-165	34	0.16	25.0	0.0	88	In remedial design area - AOC
NEW WELL #2	25-Jul-06	1615	WTF/JMR	109.50	4130.00	10.69	32	231	2.29	29.8	2.0	88	In remedial design area - AOC
MW-36S	28-Jul-06	1120	MG	64.10	1072.00	7.08	-118	81	0.17	10.0	0.0	86	Site Background
MW-45S	30-Jul-06	1215	WTF	70.20	1128.00	7.20	-98	101	0.16	7.5	0.0	78	Site Background
MW-39S	27-Jul-06	1625	MG	66.70	1283.00	6.91	-91	108	0.17	126.0	0.0	70	Crossgradient of AOC/Background
MW-34S	28-Jul-06	1110	JMR	76.90	651.60	6.94	218	417	1.13	42.9	0.0	84	Upgradient of AOC/Background

Data Values:	21	21	21	21	21	21	21	21	21
Maximum:	109.5	4130	10.69	274	473	2.29	379.70	2.00	96
Minimum:	64.1	652	5.29	-165	34	0.13	0.90	0.00	46
Arithmetic Mean:	76.1	1721	6.60	39	238	0.38	46.65	0.10	84
Geometric Mean:	75.5	1444	6.53	--	194.06	0.27	17.18		83
Standard Deviation:	10.0	1106	1.08	135	135	0.49	86.79	0.44	14
95% UCL: @	80.38	2193.36	7.06	97.00	296.00	0.59	83.77	0.28	90.49
95% LCL: @	71.8	1247.7	6.1	-18.4	180.6	0.2	9.5	-0.1	78.1

NOTES:

* ORP Correction on AgCl calibration with Platinum Electrode; Corrected eH is OPR Value + 199 mV for a "Normal Hydrogen Electrode" Equivalent.

\# AOC Indicates Radiologic Area Of Concern.

@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, Respectively.

TABLE 4
JOSLYN SAMPLING FOR RADIOLOGICAL ANALYSIS
SUMMARY OF RESULTS

Background Samples			URANIUM ISOTOPES (pCi/g)			THORIUM ISOTOPES (pCi/g)		
FIELD ID	LAB SDG	LAB ID	U-234	U235/236	U-238	Th-228	Th-230	Th-232
HA010002	F6H050196	036	1.44	0.059 J	1.29	1.03	1.68	0.78
HA020002	F6H050196	037	1.16	0.053 J	1.09	0.64	1.57	0.65
HA030002	F6H050196	001	1.65	0.081 J	1.68	0.75	2.00	0.76
HA040002	F6H050196	002	1.19	0.030 J	1.28	0.78	1.73	0.66
HA050002	F6H050196	003	1.51	0.087 J	1.92	1.19	2.43	1.30
		Background Average	1.39	0.062	1.45	0.88	1.88	0.83
		Background Median	1.44	0.059	1.29	0.78	1.73	0.76
		Background Geometric Average	1.38	0.058	1.42	0.86	1.86	0.80
		Standard Deviation (absolute)	0.21	0.023	0.34	0.23	0.34	0.27
		Background Minimum	1.16	0.030	1.09	0.64	1.57	0.65
		Background Maximum	1.65	0.087	1.92	1.19	2.43	1.30
		Background 95% UTL (95% Conf.)	2.46	0.178	3.17	2.02	3.63	2.20

Environmental Samples			URANIUM ISOTOPES (pCi/g)			THORIUM ISOTOPES (pCi/g)		
FIELD ID	LAB SDG	LAB ID	U-234	U235/236	U-238	Th-228	Th-230	Th-232
GP010001	F6H050196	026	1720	71	1780	0.44	2.35	0.62
GP020506	F6H050196	027	1.67	0.090 J	1.58	1.00	2.17	1.01
GP030001	F6H050196	028	84.0	4.8	83.0			
GP040102	F6H050196	029	12.9	0.31 U	12.0			
GP050405	F6H050196	030	2.35	0.113	2.48	1.16	2.06	1.11
GP060405	F6H050196	031	2.08	0.120	2.37			
GP070506	F6H050196	032	1.66	0.042 U	1.76			
GP080405	F6H050196	033	1.79	0.101	1.51			
GP090405	F6H050196	034	1.44	0.125	1.46	0.81	1.85	0.76
GP100708	F6H050196	035	1.41	0.121	1.82			
GP110405	F6H050196	004	1.63	0.067 J	1.57	0.88	2.16	1.01
GP130506	F6H050196	005	1.75	0.025 U	1.69	0.88	1.73	0.91
GP150304	F6H050196	006	1.88	0.139	1.88	0.76	1.89	0.78
GP160809	F6H050196	007	1.29	0.080 J	1.43	0.80	1.99	1.01
GP170405	F6H050196	008	1.41	0.168	1.84	0.62	1.55	0.75
GP180304	F6H050196	009	1.86	0.066 J	1.89			
GP190304	F6H050196	010	1.27	0.072 J	1.31			
GP210405	F6H050196	011	3.63	0.170	3.92			
GP220405	F6H050196	012	2.23	0.140	2.17			
GP230506	F6H050196	015	1.44	0.036 U	1.42	0.96 *	2.10 *	0.93 *
GP240506	F6H050196	016	1.97	0.113	2.48			
GP250405	F6H050196	017	2.53	0.120	2.37	0.98	2.53	1.42
GP260405	F6H050196	018	2.06	0.136	2.64			
GP270405	F6H050196	019	1.99	0.104	1.94	0.84	1.78	0.76
		Average	77.34	3.261	79.86	0.84	2.01	0.92
		Median	1.87	0.117	1.89	0.86	2.03	0.92
		Geometric Average	3.07	0.151	3.20	0.82	2.00	0.90
		Standard Deviation (absolute)	350.29	14.46	362.51	0.186	0.274	0.213
		Minimum	1.27	0.025 U	1.31	0.44	1.55	0.62
		Maximum	1720	71	1780	1.16	2.53	1.42

* Thorium Data from SDG F6H170372
U = not detected (reporting limit = 0.10 pCi/g for all istopes)
J = estimated value (detected; less than reporting limit)
Samples collected by Earth Tech personnel, August 1 through August 3, 2006.
Samples analyzed by STL-St Louis by alpha spectroscopy (DOE A-10R-MOD), long count.

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Buffalo District

Site Inspection Report

Appendix A

Chemical Quality Assurance Report

Joslyn Manufacturing Site
Fort Wayne, Indiana

Prepared by:

U.S. Army Corps of Engineers,
Buffalo District
Date: 1 May 2007

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
ENVIRONMENTAL HEALTH SECTION
BUFFALO, NEW YORK 14207

Subject: Chemical Quality Assurance Report
Project: Joslyn Steel 2006 Sampling
Date Sampled: July 28 – August 3, 2006
Intended Use: Evaluation Purposes
Date Submitted: 18-Oct-2006
Submitted by: [redacted]

1. SUMMARY: The data packages submitted by the contractors (Earth Tech, Inc., Bloomfield, NJ for soils and Cabrera Services, Middletown, NY for waters) met the minimum USACE HTRW chemistry data reporting requirements for "Definitive Data Package" as per EM 200-1-6.

   The primary laboratory (Severn Trent Laboratories (STL), Earth City, MO) results were reviewed for the laboratory batches which contained samples that matched the quality assurance splits. The evaluation used the QC acceptance limits that were set by the laboratory. Quality assurance (QA) split samples consisted of a total of two water samples (one sample that had a filtered and unfiltered portion) and three soil samples reviewed. All were analyzed for radiological parameters. See Table 1 for a list of the sample IDs and the associated analyses for QA split and primary sample. Table 2 lists those primary and field duplicate samples sent to STL (three water and six soil). The method quality control (QC) review indicated that the information provided supports the acceptability of the project data.

   There were no data discrepancies noted in the comparison of the quality assurance (QA) and primary sample results. The data comparisons support the acceptability of the project data.

Table 1: Primary Lab(STL) and QA Lab (Paragon) Samples

Primary Lab ID	QA Lab ID	Sampled Date	Matrix	Analyses
A-22S-F	A-22S-F QA-1	7/28/2006	Water	Iso-U
A-22S	A-22S-U QA-1	7/28/2006	Water	Iso-U
GP260405	GP260405 QA	8/3/2006	Soil	Iso-U
GP050405	GP-05-0405 QA	8/1/2006	Soil	Iso-U
GP160809	GP-160809 QA	8/2/2006	Soil	Iso-Th

Table 2: Primary and Duplicate Samples at STL

Primary Lab ID	Field Split ID	Sampled Date	Matrix	Analyses
A-275	DUP01	7/26/2006	Water	Iso-U
A-275-F	DUP01-F	7/26/2006	Water	Iso-U
MW-45S-F	MW-45S-F	7/30/2006	Water	Iso-U
GP040102	GP540102	8/1/2006	Soil	Iso-U
GP090405	GP590405	8/1/2006	Soil	Iso-U, Iso-Th
GP170405	GP670405	8/2/2006	Soil	Iso-U, Iso-Th
GP210405	GP710405	8/3/2006	Soil	Iso-U
GP230506	GP730506	8/3/2006	Soil	Iso-U, Iso-Th
GP270405	GP770506	8/3/2006	Soil	Iso-U, Iso-Th

2. PRIMARY LAB DATA EVALUATION: The contract laboratory performed the analyses using DOE methods. Results were reviewed for the batches that contained samples that matched the quality assurance splits. Proper quality control procedures were followed and documented. The contract laboratory provided radiological analytical results for samples that were analyzed for:

Isotopic Uranium (234, 235, 238) by DOE EML HASL-300, A-01-R modified, (alpha spectroscopy)
Isotopic Thorium (228, 230, 232) by DOE EML HASL-300, A-01-R modified, (alpha spectroscopy)

2.1 ACCURACY: Factors indicating the accuracy of the laboratory's data include:

2.1.1 Tracer recoveries:

2.1.1.1 Iso-U – all recoveries were within acceptable limits

2.1.1.2 Iso-Th – all recoveries were within acceptable limits

2.1.2 Laboratory Control Sample (LCS) recoveries:

2.1.2.1 Iso-U – all recoveries were within acceptable limits

2.1.2.2 Iso-Th – recovery was within acceptable limits

2.1.3 Matrix spike/Matrix spike duplicate (MS/MSD) recoveries:

2.1.3.1 Iso-U – Only analyzed in the batch containing sample GP050405. Recoveries were within acceptable limits

2.1.3.2 Iso-Th – There were two MS samples analyzed in the batch. Both recoveries were within acceptable limits (no MSDs analyzed).

2.2 PRECISION: Factors indicating the precision of the laboratory's data include

2.2.1 Relative Percent Difference (RPD) for laboratory duplicates:

2.2.1.1 Iso-U – RPD was above acceptable limits for U-235 in the soil batches associated with samples GP260405 and GP050405

2.2.1.2 Iso-Th – There were two lab duplicates in this batch. Both had RPDs that were within acceptable limits.

2.2.2 RPD for MS/MSD:

2.2.2.1 Iso-U – RPD was within acceptable limits (MSD was only analyzed in the batch associated with sample GP050405)

2.3 Method blank results for:

2.3.1 Iso-U – all results were within acceptable limits

2.3.2 Iso-Th – there was a Th-230 detection of 0.069 pCi/g in the method blank associated with sample GP160809. The sample had a detected result for Th-230 that was greater than ten times this value. As a result, the sample is not considered to be affected.

2.4 HOLDING TIMES: Holding times were met for all samples and for all parameters.

3. OBSERVATIONS FOR PRIMARY LAB:

3.1 The MS and MSD samples that were supposed to be run in the water Iso-U batch were not initially analyzed. The lab subsequently analyzed them in a separate batch, with all recoveries and RPDs within acceptable limits.

4. QUALITY CONTROL AND ASSURANCE SAMPLE DATA COMPARISON

4.1. Primary/Field Duplicate Comparison: A comparison of the primary and field duplicate results, sent to Severn Trent Laboratories (STL), is presented in Table 3. One minor data discrepancy was noted in the comparison of the primary and field duplicate test results.

4.2. Primary/QA COMPARISON: QA split samples were submitted to Paragon Analytics (Fort Collins, CO) for radiological analysis. A comparison of the quality assurance (QA) and primary test results is presented in Table 4. No data discrepancies were noted in the comparison of the quality assurance (QA) and contractor test results.

4.3 The data comparisons support the acceptability of the project data.

5. QUALITY ASSURANCE LAB DATA EVALUATION: The quality assurance laboratory performed the analyses using a Paragon Analytics developed method. Results were reviewed for the batches that contained the quality assurance splits. Proper quality control procedures were followed and documented. The laboratory provided radiological analytical results for samples that were analyzed for:

Isotopic Uranium (234, 235, 238) by Paragon procedure PA SOP714R9, (alpha spectroscopy)

Isotopic Thorium (228, 230, 232) by Paragon procedure PA SOP714R9, (alpha spectroscopy)

5.1 ACCURACY: Factors indicating the accuracy of the laboratory's data include:

5.1.1 Tracer recoveries

5.1.1.1 Iso-U – all recoveries were within acceptable limits

5.1.1.2 Iso-Th – all recoveries were within acceptable limits

5.1.2 MS/MSD recoveries

5.1.2.1 There were no MS or MSD samples analyzed for any of these batches

5.1.3 LCS recoveries

5.1.3.1 Iso-U – All recoveries were within acceptable limits. The water batch associated with samples A-22S-U QA-1 and A-22S-F QA-1 also had an LCSD, which had recoveries within acceptable limits.

5.1.3.2 Iso-Th – all recoveries were within acceptable limits

5.2 PRECISION: Factors indicating the precision of the laboratory's data include:

5.2.1 RPD for LCS/LCSD

5.2.1.1 Iso-U (water batch) – within acceptable limits

5.2.2 RPD for MS/MSD

There were no MS or MSD samples analyzed for any of these batches

5.2.3 RPD for Lab duplicates

5.2.3.1 Iso-U – There were no lab duplicates analyzed in the water batch. In the soil batch, the U-235 RPD was above acceptable limits.

5.2.3.2 Iso-Th – within acceptable limits

5.3 Method blank results

5.3.1 Iso-U – all results were within acceptable limits

5.3.2 Iso-Th – all results were within acceptable limits

5.4 Holding Times

5.4.1 Holding times were met for all samples and all analyses

6. OBSERVATIONS for QA Lab

6.1 For the water Iso-U batch, an LCSD was run instead of an MS/MSD pair due to the limited sample volume available.

6.2 For the Iso-Th batch (sample GP-160809 QA) the case narrative states that the requested MDC of 0.1 pCi/g was not met for Th-228.

Submitted by:

[redacted]
Chemist
Environmental Health Section

Table 3: Sample Results Comparison Table (Primary Sample and Field Duplicate Comparison)
Primary Sample and Field Duplicate Comparison: Groundwater

Sample ID.:	A-275			Field Duplicate ID: DUP01					
Material Description:	WATER			Date Sampled:		26-Jul-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**1.01**		**0.84**		pCi/L	18.37837838	1.202381		
U-235	**0.081**	J	**0.074**	J	pCi/L	9.032258065	1.0945946		
U-238	**0.94**		**0.95**		pCi/L	1.058201058	1.0106383		

Sample ID.:	MW-45S-F			Field Duplicate ID: MW-45S-F-D					
Material Description:	WATER			Date Sampled:		30-Jul-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**0.205**		**0.27**		pCi/L	27.36842105	1.3170732		
U-235	**0.009**	U	**0.011**	U	pCi/L	20	1.2222222		
U-238	**0.23**		**0.195**		pCi/L	16.47058824	1.1794872		

Sample ID.:	A-275-F			Field Duplicate ID: DUP01-F					
Material Description:	WATER			Date Sampled:		26-Jul-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**0.87**		**0.8**		pCi/L	8.383233533	1.0875		
U-235	**0.039**	U	**0.016**	U	pCi/L	83.63636364	2.4375		
U-238	**0.76**		**0.72**		pCi/L	5.405405405	1.0555556		

Primary Sample and Field Duplicate Comparison: Soil

Sample ID.:	GP040102		Field Duplicate ID: GP540102						
Material Description:	SOIL			Date Sampled:		1-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**12.9**		**14.7**		pCi/g	13.04347826	1.1395349		
U-235	**0.31**	U	**0.66**		pCi/g	72.16494845	2.1290323		
U-238	**12.0**		**16.8**		pCi/g	33.33333333	1.4		

Sample ID.:	GP090405		Field Duplicate ID: GP590405						
Material Description:	SOIL			Date Sampled:		1-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**1.44**		**1.02**		pCi/g	34.14634146	1.4117647		
U-235	**0.125**		**0.056**	J	pCi/g	76.24309392	2.2321429		
U-238	**1.46**		**1.35**		pCi/g	7.829181495	1.0814815		
Th-228	**0.81**		**0.77**		pCi/g	5.063291139	1.0519481		
Th-230	**1.85**		**1.79**	J	pCi/g	3.296703297	1.0335196		
Th-232	**0.76**		**0.66**		pCi/g	14.08450704	1.1515152		

Sample ID.:	GP170405		Field Duplicate ID: GP670405						
Material Description:	SOIL			Date Sampled:		2-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**1.41**		**1.61**		pCi/g	13.24503311	1.141844		
U-235	**0.168**		**0.088**	J	pCi/g	62.5	1.9090909		
U-238	**1.84**		**1.92**		pCi/g	4.255319149	1.0434783		
Th-228	**0.62**		**0.77**		pCi/g	21.58273381	1.2419355		
Th-230	**1.55**		**1.67**		pCi/g	7.453416149	1.0774194		
Th-232	**0.75**		**0.85**		pCi/g	12.5	1.1333333		

Sample ID.:	GP210405		Field Duplicate ID: GP710405						
Material Description:	SOIL			Date Sampled:		3-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**3.63**		**2.67**		pCi/g	30.47619048	1.3595506		
U-235	**0.17**		**0.148**	J	pCi/g	13.83647799	1.1486486		
U-238	**3.92**		**2.97**		pCi/g	27.57619739	1.3198653		

Sample ID.:	GP230506		Field Duplicate ID: GP730506						
Material Description:	SOIL			Date Sampled:		3-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**1.44**		**1.33**		pCi/g	7.942238267	1.0827068		
U-235	**0.036**	U	**0.142**		pCi/g	119.1011236	3.9444444	Minor	
U-238	**1.42**		**1.17**		pCi/g	19.30501931	1.2136752		
Th-228	**0.96**		**0.75**		pCi/g	24.56140351	1.28		
Th-230	**2.10**		**1.44**		pCi/g	37.28813559	1.4583333		
Th-232	**0.93**		**0.80**		pCi/g	15.02890173	1.1625		

Sample ID.:	GP270405		Field Duplicate ID: GP770506						
Material Description:	SOIL			Date Sampled:		3-Aug-06			
Analysis	Primary Result	Qualifier	Field Dup. Result	Qualifier	Units	RPD	Difference Ratio	Discrepancy	Comments
Radiological									
U-234	**1.99**		**2.02**		pCi/g	1.496259352	1.0150754		
U-235	**0.104**		**0.088**		pCi/g	16.66666667	1.1818182		
U-238	**1.94**		**1.82**		pCi/g	6.382978723	1.0659341		
Th-228	**0.84**		**0.76**		pCi/g	10	1.1052632		
Th-230	**1.78**		**1.74**		pCi/g	2.272727273	1.0229885		
Th-232	**0.76**		**0.90**		pCi/g	16.86746988	1.1842105		

Table 4: Sample Results Comparison Table (Quality Assurance and Primary Sample Comparison)

QA and Primary Sample Comparison

QA Sample ID.:	A-22S-F QA-1			Primary ID:		A-22S-F			
Material Description:	WATER			Date Sampled:		28-Jul-06			
Analysis	**QA Result**	**Qualifier**	**Primary Result**	**Qualifier**	**Units**	**RPD**	**Difference Ratio**	**Discrepancy**	**Comments**
Radiological									
U-234	**0.99**		**1.1**		pCi/L	10.52631579	1.1111111		
U-235	**0.033**	LT	**0.04**	J	pCi/L	19.17808219	1.2121212		
U-238	**0.8**		**0.88**		pCi/L	9.523809524	1.1		

QA Sample ID.:	A-22S-U QA-1			Primary ID:		A-22S			
Material Description:	WATER			Date Sampled:		28-Jul-06			
Analysis	**QA Result**	**Qualifier**	**Primary Result**	**Qualifier**	**Units**	**RPD**	**Difference Ratio**	**Discrepancy**	**Comments**
Radiological									
U-234	**1.07**		**0.95**		pCi/L	11.88118812	1.1263158		
U-235	**0.04**	LT	**0.05**	U	pCi/L	22.22222222	1.25		
U-238	**0.96**		**0.96**		pCi/L	0	1		

QA Sample ID.:	GP260405 QA			Primary ID:		GP260405			
Material Description:	SOIL			Date Sampled:		3-Aug-06			
Analysis	**QA Result**	**Qualifier**	**Primary Result**	**Qualifier**	**Units**	**RPD**	**Difference Ratio**	**Discrepancy**	**Comments**
Radiological									
U-234	**1.11**		**2.06**		pCi/g	59.93690852	1.8558559		
U-235	**0.049**	LT	**0.136**		pCi/g	94.05405405	2.7755102		
U-238	**1.29**		**2.64**		pCi/g	68.70229008	2.0465116		

QA Sample ID.:	GP-05-0405 QA			Primary ID:		GP050405			
Material Description:	SOIL			Date Sampled:		1-Aug-06			
Analysis	**QA Result**	**Qualifier**	**Primary Result**	**Qualifier**	**Units**	**RPD**	**Difference Ratio**	**Discrepancy**	**Comments**
Radiological									
U-234	**1.07**		**2.35**		pCi/g	74.85380117	2.1962617		
U-235	**0.065**	LT	**0.113**		pCi/g	53.93258427	1.7384615		
U-238	**1.44**		**2.48**		pCi/g	53.06122449	1.7222222		

QA Sample ID.:	GP-160809 QA			Primary ID:		GP160809			
Material Description:	SOIL			Date Sampled:		2-Aug-06			
Analysis	**QA Result**	**Qualifier**	**Primary Result**	**Qualifier**	**Units**	**RPD**	**Difference Ratio**	**Discrepancy**	**Comments**
Radiological									
Th-228	**0.95**	M3	**0.8**		pCi/g	17.14285714	1.1875		
Th-230	**1.8**		**1.99**		pCi/g	10.02638522	1.1055556		
Th-232	**0.88**		**1.01**		pCi/g	13.75661376	1.1477273		

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Site Inspection Report

Appendix B

Data Validation Reports

Joslyn Manufacturing Site
Fort Wayne, Indiana

Prepared by:

U.S. Army Corps of Engineers,
Buffalo District
Date: 1 May 2007

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Soil Samples
SDG # F6H050196

Data Package Summary

- There were thirty-seven (37) samples in the sample delivery group (work order). However, only thirty-five of the samples are included in this validation, as the other two were samples of investigative derived waste. The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis including isotopic uranium and thorium by alpha spectrometry.

Sample Cross Reference

Sample ID	Laboratory Sample ID
HA030002	F6H050196-001
HA040002	F6H050196-002
HA050002	F6H050196-003
GP110405	F6H050196-004
GP130506	F6H050196-005
GP150304	F6H050196-006
GP160809	F6H050196-007
GP170405	F6H050196-008
GP180304	F6H050196-009
GP190304	F6H050196-010
GP210405	F6H050196-011
GP220405	F6H050196-012
GP230506	F6H050196-015
GP240506	F6H050196-016
GP250405	F6H050196-017
GP260405	F6H050196-018
GP270405	F6H050196-019
GP540102	F6H050196-020
GP590405	F6H050196-021
GP670405	F6H050196-022
GP710405	F6H050196-023
GP730506	F6H050196-024
GP770506	F6H050196-025
GP010001	F6H050196-026
GP020506	F6H050196-027
GP030001	F6H050196-028
GP040102	F6H050196-029
GP050405	F6H050196-030

GP060405	F6H050196-031
GP070506	F6H050196-032
GP080405	F6H050196-033
GP090405	F6H050196-034
GP100708	F6H050196-035
HA010002	F6H050196-036
HA020002	F6H050196-037

Data Deliverables Completeness

- All required information was provided.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- There were no matrix spike duplicate samples analyzed for this sample delivery group.
- The duplicate RPD was above QC limits for U-235 in one of the three isotopic uranium batches.
- There were method blank detections of Th-230 in both of the isotopic thorium batches, and U-234 and U-238 in one of the three isotopic uranium batches.

Sample Deviations

- Sample HA040002 had a U-235 concentration that was below the uncertainty.

USACE - Buffalo District
Data Verification and Validation Report

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
HA030002	Th-228	0.75		
	Th-230	2		
	Th-232	0.76		
	U-234	1.65		
	U-235	0.081	J	J
	U-238	1.68		
HA040002	Th-228	0.78		
	Th-230	1.73		
	Th-232	0.66		
	U-234	1.19		
	U-235	0.03	J	U
	U-238	1.28		
HA050002	Th-228	1.19		
	Th-230	2.43		
	Th-232	1.3		
	U-234	1.51		
	U-235	0.087	J	J
	U-238	1.92		
GP110405	Th-228	0.88		
	Th-230	2.16		
	Th-232	1.01		
	U-234	1.63		
	U-235	0.067	J	J
	U-238	1.57		
GP130506	Th-228	0.88		
	Th-230	1.73		
	Th-232	0.91		
	U-234	1.71		
	U-235	0.025	U	U
	U-238	1.69		
GP150304	Th-228	0.76		
	Th-230	1.89		
	Th-232	0.78		
	U-234	1.88		
	U-235	0.139		
	U-238	1.88		

GP160809	Th-228	0.8		
	Th-230	1.99		
	Th-232	1.01		
	U-234	1.29		
	U-235	0.08	J	J
	U-238	1.43		
GP170405	Th-228	0.62		
	Th-230	1.55		
	Th-232	0.75		
	U-234	1.41		
	U-235	0.168		
	U-238	1.84		
GP180304	U-234	1.86		
	U-235	0.066	J	J
	U-238	1.89		
GP190304	U-234	1.27		
	U-235	0.072	J	J
	U-238	1.31		
GP210405	U-234	3.63		
	U-235	0.17		
	U-238	3.92		
GP220405	U-234	2.23		
	U-235	0.14		
	U-238	2.17		
GP230506	U-234	1.44		
	U-235	0.036	U	U
	U-238	1.42		
GP240506	U-234	1.97		
	U-235	0.113		
	U-238	2.48		
GP250405	Th-228	0.98		
	Th-230	2.53		
	Th-232	1.42		
	U-234	2.53		
	U-235	0.12		
	U-238	2.37		

GP260405	U-234	2.06		
	U-235	0.136		
	U-238	2.64		
GP270405	Th-228	0.84		
	Th-230	1.78		
	Th-232	0.76		
	U-234	1.99		
	U-235	0.104		
	U-238	1.94		
GP540102	U-234	14.7		
	U-235	0.66		
	U-238	16.8		
GP590405	Th-228	0.77		
	Th-230	1.79		
	Th-232	0.66		
	U-234	1.02		
	U-235	0.056	J	J
	U-238	1.35		
GP670405	Th-228	0.77		
	Th-230	1.67		
	Th-232	0.85		
	U-234	1.61		
	U-235	0.088	J	J
	U-238	1.92		
GP710405	U-234	2.67		
	U-235	0.148		
	U-238	2.97		
GP730506	U-234	1.33		
	U-235	0.142		
	U-238	1.17		
GP770506	Th-228	0.76		
	Th-230	1.74		
	Th-232	0.9		
	U-234	2.02		
	U-235	0.088	J	J
	U-238	1.82		

GP010001	Th-228	0.44		
	Th-230	2.35		
	Th-232	0.62		
	U-234	1720		
	U-235	71		
	U-238	1780		
GP020506	Th-228	1		
	Th-230	2.17		
	Th-232	1.01		
	U-234	1.67		
	U-235	0.09	J	J
	U-238	1.58		
GP030001	U-234	84		
	U-235	4.8		
	U-238	83		
GP040102	U-234	12.9		
	U-235	0.31	U	U
	U-238	12		
GP050405	Th-228	1.16		
	Th-230	2.06		
	Th-232	1.11		
	U-234	2.35		
	U-235	0.113		
	U-238	2.48		
GP060405	U-234	2.08		
	U-235	0.12		
	U-238	2.37		
GP070506	U-234	1.66		
	U-235	0.042	U	U
	U-238	1.76		
GP080405	U-234	1.79		
	U-235	0.101		
	U-238	1.51		

GP090405	Th-228	0.81		
	Th-230	1.85		
	Th-232	0.76		
	U-234	1.44		
	U-235	0.125		
	U-238	1.46		
GP100708	U-234	1.41		
	U-235	0.121		
	U-238	1.82		
HA010002	Th-228	1.03		
	Th-230	1.68		
	Th-232	0.78		
	U-234	1.44		
	U-235	0.059	J	J
	U-238	1.29		
HA020002	Th-228	0.64		
	Th-230	1.57		
	Th-232	0.65		
	U-234	1.16		
	U-235	0.053	J	J
	U-238	1.09		

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6H050196

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Earth Tech, Inc.
Address (City/State): Bloomfield, NJ

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 8/5/2006
Date of Data Package: 8/21/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 9/21/2006
Validation by: [redacted] Date: 9/22/2006

Parameters	Instrumentation
Thoruim 228	Alpha spec
Thorium-230	
Thorium-232	
Uranium-234	
Uranium-235	
Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	320215, 320216, 320217
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	N
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6222115	Th-228	F6H100000-115B			F6H050196-007	20						
6222115	Th-230	F6H100000-115B	.069J	B+		5			F6H100000-115C	95		
6222115	Th-232	F6H100000-115B				23						
	Th-228				F6H050196-026	26						
	Th-230					20						
	Th-232					7						
6230453	Th-228	F6H180000-453B										
6230453	Th-230	F6H180000-453B	.049J	B+					F6H180000-453C	120		
6230453	Th-232	F6H180000-453B							LCSD	110		
6222119	U-234	F6H100000-119B			F6H050196-007	8			F6H100000-119C	101		
6222119	U-235	F6H100000-119B				U						
6222119	U-238	F6H100000-119B				12			F6H100000-119c	108		
6222120	U-234	F6H100000-120B			F6H050196-009	6			F6H100000-120C	98		
6222120	U-235	F6H100000-120B				36	E	P				
6222120	U-238	F6H100000-120B				4			F6H100000-120C	98		
6228096	U-234	F6H160000-096B	.063J	B+	F6H050196-028	2			F6H160000-096C	105		
6228096	U-235	F6H160000-096B				15						
6228096	U-238	F6H160000-096B	.028J	B+		11			F6H160000-096C	111		

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6222115	Th-228					No MSD								
6222115	Th-230	F6H050196-007	86			No MSD								B+
6222115	Th-232					No MSD								
	Th-228					No MSD								
	Th-230	F6H050196-026	117			No MSD								
	Th-232					No MSD								
6230453	Th-228					No MSD								
6230453	Th-230					No MSD								B+
6230453	Th-232					No MSD								
6222119	U-234	F6H050196-007	95			No MSD								
6222119	U-235					No MSD								
6222119	U-238	F6H050196-007	102			No MSD								
6222120	U-234					No MSD								
6222120	U-235					No MSD								P
6222120	U-238					No MSD								
6228096	U-234					No MSD								B+
6228096	U-235					No MSD								
6228096	U-238					No MSD								B+

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6H050196
Severn Trent (STL) St. Louis

Sample ID: HA030002 Sample Collection
Laboratory Sample ID: F6H050196-001 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.75	0.19	0.08	0.1	pCi/g		84	Y	Y			6222115					Thoruim 228	
Thorium-230	2	0.38	0.04	0.1	pCi/g		84	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.76	0.19	0.04	0.1	pCi/g		84	Y	Y			6222115					Thorium-232	
Uranium-234	1.65	0.33	0.02	0.1	pCi/g		88	Y	Y			6222119					Uranium-234	
Uranium-235	0.081	0.062	0.027	0.1	pCi/g	J	88	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.68	0.33	0.04	0.1	pCi/g		88	Y	Y			6222119					Uranium-238	

Sample ID: HA040002 Sample Collection
Laboratory Sample ID: F6H050196-002 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.78	0.2	0.08	0.1	pCi/g		87	Y	Y			6222115					Thoruim 228	
Thorium-230	1.73	0.34	0.02	0.1	pCi/g		87	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.66	0.18	0.05	0.1	pCi/g		87	Y	Y			6222115					Thorium-232	
Uranium-234	1.19	0.26	0.02	0.1	pCi/g		90	Y	Y			6222119					Uranium-234	
Uranium-235	0.03	0.041	0.027	0.1	pCi/g	J	90	Y	N	E	U	6222119		U		U	Uranium-235	Sample result is less than the uncertainty
Uranium-238	1.28	0.27	0.02	0.1	pCi/g		90	Y	Y			6222119					Uranium-238	

Sample ID: HA050002 Sample Collection
Laboratory Sample ID: F6H050196-003 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	1.19	0.27	0.08	0.1	pCi/g		81	Y	Y			6222115					Thoruim 228	
Thorium-230	2.43	0.45	0.05	0.1	pCi/g		81	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.3	0.28	0.05	0.1	pCi/g		81	Y	Y			6222115					Thorium-232	
Uranium-234	1.51	0.32	0.05	0.1	pCi/g		80	Y	Y			6222119					Uranium-234	
Uranium-235	0.087	0.066	0.029	0.1	pCi/g	J	80	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.92	0.38	0.04	0.1	pCi/g		80	Y	Y			6222119					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: GP110405 Sample Collection
Laboratory Sample ID: F6H050196-004 Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.88	0.21	0.08	0.1	pCi/g		92	Y	Y			6222115					Thoruim 228	
Thorium-230	2.16	0.39	0.05	0.1	pCi/g		92	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.01	0.22	0.02	0.1	pCi/g		92	Y	Y			6222115					Thorium-232	
Uranium-234	1.63	0.32	0.03	0.1	pCi/g		94	Y	Y			6222119					Uranium-234	
Uranium-235	0.067	0.055	0.026	0.1	pCi/g	J	94	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.57	0.31	0.03	0.1	pCi/g		94	Y	Y			6222119					Uranium-238	

Sample ID: GP130506 Sample Collection
Laboratory Sample ID: F6H050196-005 Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.88	0.21	0.07	0.1	pCi/g		93	Y	Y			6222115					Thoruim 228	
Thorium-230	1.73	0.33	0.05	0.1	pCi/g		93	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.91	0.21	0.05	0.1	pCi/g		93	Y	Y			6222115					Thorium-232	
Uranium-234	1.71	0.35	0.05	0.1	pCi/g		76	Y	Y			6222119					Uranium-234	
Uranium-235	0.025	0.043	0.066	0.1	pCi/g	U	76	Y	N	E	U	6222119		U		U	Uranium-235	
Uranium-238	1.69	0.35	0.04	0.1	pCi/g		76	Y	Y			6222119					Uranium-238	

Sample ID: GP150304 Sample Collection
Laboratory Sample ID: F6H050196-006 Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.76	0.2	0.07	0.1	pCi/g		80	Y	Y			6222115					Thoruim 228	
Thorium-230	1.89	0.37	0.05	0.1	pCi/g		80	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.78	0.2	0.05	0.1	pCi/g		80	Y	Y			6222115					Thorium-232	
Uranium-234	1.88	0.37	0.05	0.1	pCi/g		79	Y	Y			6222119					Uranium-234	
Uranium-235	0.139	0.083	0.029	0.1	pCi/g		79	Y	Y			6222119					Uranium-235	
Uranium-238	1.88	0.37	0.04	0.1	pCi/g		79	Y	Y			6222119					Uranium-238	

Sample ID: GP160809 Sample Collection
Laboratory Sample ID: F6H050196-007 Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.8	0.2	0.08	0.1	pCi/g		84	Y	Y			6222115					Thoruim 228	
Thorium-230	1.99	0.38	0.05	0.1	pCi/g		84	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.01	0.23	0.04	0.1	pCi/g		84	Y	Y			6222115					Thorium-232	
Uranium-234	1.29	0.27	0.04	0.1	pCi/g		88	Y	Y			6222119					Uranium-234	
Uranium-235	0.08	0.061	0.027	0.1	pCi/g	J	88	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.43	0.29	0.02	0.1	pCi/g		88	Y	Y			6222119					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: GP170405
Laboratory Sample ID: F6H050196-008
Sample Collection Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.62	0.17	0.09	0.1	pCi/g		87	Y	Y			6222115					Thoruim 228	
Thorium-230	1.55	0.31	0.02	0.1	pCi/g		87	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.75	0.19	0.02	0.1	pCi/g		87	Y	Y			6222115					Thorium-232	
Uranium-234	1.41	0.31	0.04	0.1	pCi/g		70	Y	Y			6222119					Uranium-234	
Uranium-235	0.168	0.095	0.055	0.1	pCi/g		70	Y	Y			6222119					Uranium-235	
Uranium-238	1.84	0.38	0.05	0.1	pCi/g		70	Y	Y			6222119					Uranium-238	

Sample ID: GP180304
Laboratory Sample ID: F6H050196-009
Sample Collection Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.86	0.4	0.05	0.1	pCi/g		78	Y	Y			6222120					Uranium-234	
Uranium-235	0.066	0.066	0.036	0.1	pCi/g	J	78	Y	Y		J	6222120		J	P	J	Uranium-235	
Uranium-238	1.89	0.4	0.03	0.1	pCi/g		78	Y	Y			6222120					Uranium-238	

Sample ID: GP190304
Laboratory Sample ID: F6H050196-010
Sample Collection Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.27	0.31	0.07	0.1	pCi/g		72	Y	Y			6222120					Uranium-234	
Uranium-235	0.072	0.071	0.039	0.1	pCi/g	J	72	Y	Y		J	6222120		J	P	J	Uranium-235	
Uranium-238	1.31	0.32	0.06	0.1	pCi/g		72	Y	Y			6222120					Uranium-238	

Sample ID: GP210405
Laboratory Sample ID: F6H050196-011
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	3.63	0.68	0.07	0.1	pCi/g		79	Y	Y			6222120					Uranium-234	
Uranium-235	0.17	0.0997	0.058	0.1	pCi/g		79	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	3.92	0.72	0.05	0.1	pCi/g		79	Y	Y			6222120					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: GP220405
Laboratory Sample ID: F6H050196-012
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	2.23	0.45	0.06	0.1	pCi/g		81	Y	Y			6222120					Uranium-234	
Uranium-235	0.14	0.089	0.056	0.1	pCi/g		81	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	2.17	0.44	0.03	0.1	pCi/g		81	Y	Y			6222120					Uranium-238	

Sample ID: GP230506
Laboratory Sample ID: F6H050196-015
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.44	0.34	0.06	0.1	pCi/g		73	Y	Y			6222120					Uranium-234	
Uranium-235	0.036	0.052	0.071	0.1	pCi/g	U	73	Y	N	E	U	6222120		U	P	U	Uranium-235	
Uranium-238	1.42	0.33	0.06	0.1	pCi/g		73	Y	Y			6222120					Uranium-238	

Sample ID: GP240506
Laboratory Sample ID: F6H050196-016
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.97	0.43	0.06	0.1	pCi/g		69	Y	Y			6222120					Uranium-234	
Uranium-235	0.113	0.088	0.075	0.1	pCi/g		69	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	2.48	0.52	0.07	0.1	pCi/g		69	Y	Y			6222120					Uranium-238	

Sample ID: GP250405
Laboratory Sample ID: F6H050196-017
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.98	0.26	0.1	0.1	pCi/g		67	Y	Y			6222115					Thoruim 228	
Thorium-230	2.53	0.5	0.05	0.1	pCi/g		67	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.42	0.32	0.03	0.1	pCi/g		67	Y	Y			6222115					Thorium-232	
Uranium-234	2.53	0.47	0.04	0.1	pCi/g		76	Y	Y			6222119					Uranium-234	
Uranium-235	0.12	0.077	0.029	0.1	pCi/g		76	Y	Y			6222119					Uranium-235	
Uranium-238	2.37	0.45	0.05	0.1	pCi/g		76	Y	Y			6222119					Uranium-238	

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Sample ID: GP260405 Sample Collection
Laboratory Sample ID: F6H050196-018 Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	2.06	0.45	0.03	0.1	pCi/g		70	Y	Y			6222120					Uranium-234	
Uranium-235	0.136	0.098	0.041	0.1	pCi/g		70	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	2.64	0.55	0.07	0.1	pCi/g		70	Y	Y			6222120					Uranium-238	

Sample ID: GP270405 Sample Collection
Laboratory Sample ID: F6H050196-019 Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.84	0.23	0.09	0.2	pCi/g		88	Y	Y			6230453					Thoruim 228	
Thorium-230	1.78	0.38	0.05	0.2	pCi/g		88	Y	Y			6230453			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.76	0.21	0.05	0.2	pCi/g		88	Y	Y			6230453					Thorium-232	
Uranium-234	1.99	0.38	0.04	0.1	pCi/g		82	Y	Y			6222119					Uranium-234	
Uranium-235	0.104	0.071	0.028	0.1	pCi/g		82	Y	Y			6222119					Uranium-235	
Uranium-238	1.94	0.37	0.04	0.1	pCi/g		82	Y	Y			6222119					Uranium-238	

Sample ID: GP540102 Sample Collection
Laboratory Sample ID: F6H050196-020 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	14.7	2.3	0.06	0.1	pCi/g		87	Y	Y			6222120					Uranium-234	
Uranium-235	0.66	0.21	0.03	0.1	pCi/g		87	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	16.8	2.6	0.04	0.1	pCi/g		87	Y	Y			6222120					Uranium-238	

Sample ID: GP590405 Sample Collection
Laboratory Sample ID: F6H050196-021 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.77	0.21	0.08	0.1	pCi/g		76	Y	Y			6222115					Thoruim 228	
Thorium-230	1.79	0.36	0.05	0.1	pCi/g		76	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.66	0.18	0.02	0.1	pCi/g		76	Y	Y			6222115					Thorium-232	
Uranium-234	1.02	0.24	0.04	0.1	pCi/g		78	Y	Y			6222119					Uranium-234	
Uranium-235	0.056	0.056	0.03	0.1	pCi/g	J	78	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.35	0.29	0.05	0.1	pCi/g		78	Y	Y			6222119					Uranium-238	

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Sample ID: GP670405
Laboratory Sample ID: F6H050196-022
Sample Collection Date: 8/2/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.77	0.19	0.07	0.1	pCi/g		88	Y	Y			6222115					Thoruim 228	
Thorium-230	1.67	0.33	0.05	0.1	pCi/g		88	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.85	0.2	0.04	0.1	pCi/g		88	Y	Y			6222115					Thorium-232	
Uranium-234	1.61	0.32	0.04	0.1	pCi/g		84	Y	Y			6222119					Uranium-234	
Uranium-235	0.088	0.065	0.055	0.1	pCi/g	J	84	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.92	0.37	0.02	0.1	pCi/g		84	Y	Y			6222119					Uranium-238	

Sample ID: GP710405
Laboratory Sample ID: F6H050196-023
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	2.67	0.55	0.05	0.1	pCi/g		69	Y	Y			6222120					Uranium-234	
Uranium-235	0.148	0.099	0.066	0.1	pCi/g		69	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	2.97	0.6	0.06	0.1	pCi/g		69	Y	Y			6222120					Uranium-238	

Sample ID: GP730506
Laboratory Sample ID: F6H050196-024
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.33	0.3	0.06	0.1	pCi/g		89	Y	Y			6222120					Uranium-234	
Uranium-235	0.142	0.088	0.032	0.1	pCi/g		89	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	1.17	0.27	0.05	0.1	pCi/g		89	Y	Y			6222120					Uranium-238	

Sample ID: GP770506
Laboratory Sample ID: F6H050196-025
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.76	0.19	0.08	0.1	pCi/g		89	Y	Y			6222115					Thoruim 228	
Thorium-230	1.74	0.33	0.06	0.1	pCi/g		89	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.9	0.2	0.04	0.1	pCi/g		89	Y	Y			6222115					Thorium-232	
Uranium-234	2.02	0.39	0.05	0.1	pCi/g		83	Y	Y			6222119					Uranium-234	
Uranium-235	0.088	0.067	0.03	0.1	pCi/g	J	83	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.82	0.36	0.04	0.1	pCi/g		83	Y	Y			6222119					Uranium-238	

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Sample ID: GP010001 Sample Collection
Laboratory Sample ID: F6H050196-026 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.44	0.15	0.08	0.1	pCi/g		80	Y	Y			6222115					Thoruim 228	
Thorium-230	2.35	0.44	0.05	0.1	pCi/g		80	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.62	0.17	0.02	0.1	pCi/g		80	Y	Y			6222115					Thorium-232	
Uranium-234	1720	270	5	20	pCi/g		99	Y	Y			6228096			B+		Uranium-234	Sample result is greater than 5 times the blank result
Uranium-235	71	23	4	25	pCi/g		99	Y	Y			6228096					Uranium-235	
Uranium-238	1780	280	3	20	pCi/g		99	Y	Y			6228096			B+		Uranium-238	Sample result is greater than 5 times the blank result

Sample ID: GP020506 Sample Collection
Laboratory Sample ID: F6H050196-027 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	1	0.24	0.09	0.1	pCi/g		84	Y	Y			6222115					Thoruim 228	
Thorium-230	2.17	0.41	0.05	0.1	pCi/g		84	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.01	0.23	0.05	0.1	pCi/g		84	Y	Y			6222115					Thorium-232	
Uranium-234	1.67	0.33	0.04	0.1	pCi/g		85	Y	Y			6222119					Uranium-234	
Uranium-235	0.09	0.064	0.027	0.1	pCi/g	J	85	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.58	0.32	0.04	0.1	pCi/g		85	Y	Y			6222119					Uranium-238	

Sample ID: GP030001 Sample Collection
Laboratory Sample ID: F6H050196-028 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	84	14	0.60	3	pCi/g		101	Y	Y			6228096			B+		Uranium-234	Sample result is greater than 5 times the blank result
Uranium-235	4.8	2	0.5	3	pCi/g		101	Y	Y			6228096					Uranium-235	
Uranium-238	83	14	0.70	3	pCi/g		101	Y	Y			6228096			B+		Uranium-238	Sample result is greater than 5 times the blank result

Sample ID: GP040102 Sample Collection
Laboratory Sample ID: F6H050196-029 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	12.9	3.3	0.80	3	pCi/g		102	Y	Y			6228096			B+		Uranium-234	Sample result is greater than 5 times the blank result
Uranium-235	0.31	0.51	0.73	3	pCi/g	U	102	Y	N	E	U	6228096		U		U	Uranium-235	
Uranium-238	12	3.1	0.70	3	pCi/g		102	Y	Y			6228096			B+		Uranium-238	Sample result is greater than 5 times the blank result

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Sample ID: GP050405 Sample Collection
Laboratory Sample ID: F6H050196-030 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	1.16	0.26	0.08	0.1	pCi/g		79	Y	Y			6222115					Thoruim 228	
Thorium-230	2.06	0.4	0.05	0.1	pCi/g		79	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	1.11	0.25	0.04	0.1	pCi/g		79	Y	Y			6222115					Thorium-232	
Uranium-234	2.35	0.45	0.05	0.1	pCi/g		79	Y	Y			6222119					Uranium-234	
Uranium-235	0.113	0.076	0.03	0.1	pCi/g		79	Y	Y			6222119					Uranium-235	
Uranium-238	2.48	0.47	0.04	0.1	pCi/g		79	Y	Y			6222119					Uranium-238	

Sample ID: GP060405 Sample Collection
Laboratory Sample ID: F6H050196-031 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	2.08	0.47	0.08	0.1	pCi/g		67	Y	Y			6222120					Uranium-234	
Uranium-235	0.12	0.094	0.08	0.1	pCi/g		67	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	2.37	0.51	0.06	0.1	pCi/g		67	Y	Y			6222120					Uranium-238	

Sample ID: GP070506 Sample Collection
Laboratory Sample ID: F6H050196-032 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.66	0.36	0.07	0.1	pCi/g		77	Y	Y			6222120					Uranium-234	
Uranium-235	0.042	0.055	0.07	0.1	pCi/g	U	77	Y	N	E	U	6222120		U	P	U	Uranium-235	
Uranium-238	1.76	0.37	0.06	0.1	pCi/g		77	Y	Y			6222120					Uranium-238	

Sample ID: GP080405 Sample Collection
Laboratory Sample ID: F6H050196-033 Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.79	0.38	0.06	0.1	pCi/g		83	Y	Y			6222120					Uranium-234	
Uranium-235	0.101	0.078	0.034	0.1	pCi/g		83	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	1.51	0.34	0.06	0.1	pCi/g		83	Y	Y			6222120					Uranium-238	

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Sample ID: GP090405
Laboratory Sample ID: F6H050196-034
Sample Collection Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.81	0.21	0.08	0.1	pCi/g		81	Y	Y			6222115					Thoruim 228	
Thorium-230	1.85	0.37	0.02	0.1	pCi/g		81	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.76	0.2	0.04	0.1	pCi/g		81	Y	Y			6222115					Thorium-232	
Uranium-234	1.44	0.31	0.05	0.1	pCi/g		74	Y	Y			6222119					Uranium-234	
Uranium-235	0.125	0.081	0.031	0.1	pCi/g		74	Y	Y			6222119					Uranium-235	
Uranium-238	1.46	0.31	0.02	0.1	pCi/g		74	Y	Y			6222119					Uranium-238	

Sample ID: GP100708
Laboratory Sample ID: F6H050196-035
Sample Collection Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228					pCi/g												Thoruim 228	
Thorium-230					pCi/g												Thorium-230	
Thorium-232					pCi/g												Thorium-232	
Uranium-234	1.41	0.34	0.05	0.1	pCi/g		74	Y	Y			6222120					Uranium-234	
Uranium-235	0.121	0.092	0.041	0.1	pCi/g		74	Y	Y			6222120			P		Uranium-235	High duplicate RPD doesn't necessitate a qualifier
Uranium-238	1.82	0.41	0.07	0.1	pCi/g		74	Y	Y			6222120					Uranium-238	

Sample ID: HA010002
Laboratory Sample ID: F6H050196-036
Sample Collection Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	1.03	0.24	0.07	0.1	pCi/g		76	Y	Y			6222115					Thoruim 228	
Thorium-230	1.68	0.34	0.04	0.1	pCi/g		76	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.78	0.2	0.05	0.1	pCi/g		76	Y	Y			6222115					Thorium-232	
Uranium-234	1.44	0.29	0.05	0.1	pCi/g		88	Y	Y			6222119					Uranium-234	
Uranium-235	0.059	0.053	0.027	0.1	pCi/g	J	88	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.29	0.27	0.04	0.1	pCi/g		88	Y	Y			6222119					Uranium-238	

Sample ID: HA020002
Laboratory Sample ID: F6H050196-037
Sample Collection Date: 8/1/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.64	0.18	0.09	0.1	pCi/g		74	Y	Y			6222115					Thoruim 228	
Thorium-230	1.57	0.33	0.07	0.1	pCi/g		74	Y	Y			6222115			B+		Thorium-230	Sample result is greater than 5 times the blank result
Thorium-232	0.65	0.18	0.06	0.1	pCi/g		74	Y	Y			6222115					Thorium-232	
Uranium-234	1.16	0.26	0.02	0.1	pCi/g		77	Y	Y			6222119					Uranium-234	
Uranium-235	0.053	0.052	0.051	0.1	pCi/g	J	77	Y	Y		J	6222119		J		J	Uranium-235	
Uranium-238	1.09	0.25	0.05	0.1	pCi/g		77	Y	Y			6222119					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Water Samples
SDG # F6H160302

Data Package Summary

- There were forty-six (46) samples in the sample delivery group (work order). The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis including isotopic uranium by alpha spectrometry.

Sample Cross Reference

Sample ID	Laboratory Sample ID
MW-30S-F	F6H160302-001
MW-34S	F6H160302-002
DUP01	F6H160302-003
A-185-F	F6H160302-004
MW-31D-F	F6H160302-005
MW-16S-F	F6H160302-006
A-275	F6H160302-007
MW-34S-F	F6H160302-008
A-275-F	F6H160302-009
MW-30S	F6H160302-010
MW-31D	F6H160302-011
MW-38S-F	F6H160302-012
A-235	F6H160302-013
A-18S	F6H160302-014
MW-38S	F6H160302-015
MW-16S-U	F6H160302-016
MW-36S	F6H160302-017
MW-45S-F-D	F6H160302-018
MW-49S	F6H160302-019
MW-45S-F	F6H160302-020
MW-15S	F6H160302-021
MW-49S-F	F6H160302-022
DUP01-F	F6H160302-023
MW-32S	F6H160302-024
NEW WELL #2-F	F6H160302-025
MW-19S	F6H160302-026
MW-19S-F	F6H160302-027
MW-15S-F	F6H160302-028
A-22S-F	F6H160302-029
NEW WELL #1-F	F6H160302-030

A-235-F	F6H160302-031
A-24S-U	F6H160302-032
A-22S	F6H160302-033
MW-45-S	F6H160302-034
MW-17S	F6H160302-035
MW-32S-F	F6H160302-036
NEW WELL #1-U	F6H160302-037
MW-17S-F	F6H160302-038
MW-36S-F	F6H160302-039
MW-39S-F	F6H160302-040
A-21S	F6H160302-041
A-24S-F	F6H160302-042
MW-39S	F6H160302-043
MW-45S-D	F6H160302-044
A-21S-F	F6H160302-045
NEW WELL #2	F6H160302-046

Data Deliverables Completeness

- All required information was provided.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- There were no matrix spike or matrix spike duplicate samples analyzed for this sample delivery group. Two batches have a sample duplicate, while the third batch has a laboratory control sample duplicate to show precision.

Sample Deviations

- Samples A-235 and A-22S-F had U-235 concentrations that were below the uncertainty.

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
MW-30S-F	U-234	0.45		
	U-235	0.008	U	U
	U-238	0.33		
MW-34S	U-234	1.16		
	U-235	0.038	U	U
	U-238	1.38		
DUP01	U-234	0.84		
	U-235	0.074	J	J
	U-238	0.95		
A-185-F	U-234	1.22		
	U-235	0.03	U	U
	U-238	1.1		
MW-31D-F	U-234	0	U	U
	U-235	-0.009	U	U
	U-238	0.017	U	U
MW-16S-F	U-234	0.018	U	U
	U-235	-0.003	U	U
	U-238	0.035	U	U
A-275	U-234	1.01		
	U-235	0.081	J	J
	U-238	0.94		
MW-34S-F	U-234	1.27		
	U-235	0.081	J	J
	U-238	1.29		

A-275-F	U-234	0.87		
	U-235	0.039	U	U
	U-238	0.76		
MW-30S	U-234	0.56		
	U-235	0.011	U	U
	U-238	0.36		
MW-31D	U-234	0.03	U	U
	U-235	-0.003	U	U
	U-238	0.017	U	U
MW-38S-F	U-234	0.097	J	J
	U-235	0.003	U	U
	U-238	0.081	J	J
A-235	U-234	1.21		
	U-235	0.053	J	U
	U-238	1.35		
A-18S	U-234	0.99		
	U-235	0.02	U	U
	U-238	1.21		
MW-38S	U-234	0.059	U	U
	U-235	0	U	U
	U-238	0.077	J	J
MW-16S-U	U-234	-0.005	U	U
	U-235	0.009	U	U
	U-238	-0.002	U	U
MW-36S	U-234	0.118		
	U-235	-0.003	U	U
	U-238	0.075	J	J
MW-45S-F-D	U-234	0.27		
	U-235	0.011	U	U
	U-238	0.195		
MW-49S	U-234	0.108		
	U-235	0.008	U	U
	U-238	0.199		

MW-45S-F	U-234	0.205		
	U-235	0.009	U	U
	U-238	0.23		
MW-15S	U-234	0.015	U	U
	U-235	0	U	U
	U-238	0.015	U	U
MW-49S-F	U-234	0.202		
	U-235	0.01	U	U
	U-238	0.15		
DUP01-F	U-234	0.8		
	U-235	0.016	U	U
	U-238	0.72		
MW-32S	U-234	0.68		
	U-235	0.074	J	J
	U-238	0.67		
NEW WELL #2-F	U-234	0.038	U	U
	U-235	0.008	U	U
	U-238	0	U	U
MW-19S	U-234	1.12		
	U-235	0.081	J	J
	U-238	1.4		
MW-19S-F	U-234	1.11		
	U-235	0.084	J	J
	U-238	1.14		
MW-15S-F	U-234	0.072	J	J
	U-235	-0.003	U	U
	U-238	0.025	U	U
A-22S-F	U-234	1.1		
	U-235	0.04	J	U
	U-238	0.88		
NEW WELL #1-F	U-234	2.52		
	U-235	0.157		
	U-238	1.78		

A-235-F	U-234	1.23		
	U-235	0.031	U	U
	U-238	1.18		
A-24S-U	U-234	0.5		
	U-235	0	U	U
	U-238	0.39		
A-22S	U-234	0.95		
	U-235	0.05	U	U
	U-238	0.96		
MW-45-S	U-234	0.147		
	U-235	0.002	U	U
	U-238	0.206		
MW-17S	U-234	0.31		
	U-235	0.018	U	U
	U-238	0.31		
MW-32S-F	U-234	0.54		
	U-235	0.024	U	U
	U-238	0.73		
NEW WELL #1-U	U-234	2.19		
	U-235	0.066	J	J
	U-238	2.06		
MW-17S-F	U-234	0.187		
	U-235	-0.006	U	U
	U-238	0.29		
MW-36S-F	U-234	0.174		
	U-235	0.011	U	U
	U-238	0.129		
MW-39S-F	U-234	0.29		
	U-235	0.029	U	U
	U-238	0.167		
A-21S	U-234	1.02		
	U-235	0.077	J	J
	U-238	0.98		

A-24S-F	U-234	0.18		
	U-235	-0.006	U	U
	U-238	0.209		
MW-39S	U-234	0.211		
	U-235	0.024	U	U
	U-238	0.211		
MW-45S-D	U-234	0.194		
	U-235	0.011	U	U
	U-238	0.194		
A-21S-F	U-234	0.96		
	U-235	0.112		
	U-238	0.87		
NEW WELL #2	U-234	0.021	U	U
	U-235	-0.002	U	U
	U-238	0.006	U	U

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6H160302

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Cabrera Services
Address (City/State): Middletown, NY

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 8/16/2006
Date of Data Package: 8/29/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 10/11/2006
Validation by: [redacted] Date: 10/12/2006

Parameters	Instrumentation
Uranium-234	Alpha spec
Uranium-235	
Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	Joslyn-01, 02, and 03
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	N
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6233483	U-234	F6H210000-483B			F6H160302-007	5			F6H210000-483C	117		
6233483	U-235	F6H210000-483B			F6H160302-007	U						
6233483	U-238	F6H210000-483B			F6H160302-007	6			F6H210000-483C	109		
6233520	U-234	F6H210000-520B			F6H160302-009	2			F6H210000-520B	93		
6233520	U-235	F6H210000-520B			F6H160302-009	U						
6233520	U-238	F6H210000-520B			F6H160302-009	13			F6H210000-520B	82		
6236379	U-234	F6H240000-379B							F6H240000-379B	95		
6236379	U-235	F6H240000-379B										
6236379	U-238	F6H240000-379B							F6H240000-379B	100		
									LCSD:	111		
										110		
									RPD:	16		
										10		

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6233483	U-234	No MS				No MSD								
6233483	U-235	No MS				No MSD								
6233483	U-238	No MS				No MSD								
6233520	U-234	No MS				No MSD								
6233520	U-235	No MS				No MSD								
6233520	U-238	No MS				No MSD								
6236379	U-234	No MS				No MSD								
6236379	U-235	No MS				No MSD								
6236379	U-238	No MS				No MSD								

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6H160302
Severn Trent (STL) St. Louis

Sample ID: MW-30S-F
Laboratory Sample ID: F6H160302-001
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.45	0.14	0.04	0.1	pCi/L		82	Y	Y			6233483					Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.33	0.12	0.05	0.1	pCi/L		82	Y	Y			6233483					Uranium-238	

Sample ID: MW-34S
Laboratory Sample ID: F6H160302-002
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.16	0.26	0.05	0.1	pCi/L		86	Y	Y			6233483					Uranium-234	
Uranium-235	0.038	0.042	0.046	0.1	pCi/L	U	86	Y	Y		U	6233483		U		U	Uranium-235	
Uranium-238	1.38	0.29	0.02	0.1	pCi/L		86	Y	Y			6233483					Uranium-238	

Sample ID: DUP01
Laboratory Sample ID: F6H160302-003
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.84	0.21	0.05	0.1	pCi/L		83	Y	Y			6233483					Uranium-234	
Uranium-235	0.074	0.061	0.029	0.1	pCi/L	J	83	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	0.95	0.22	0.04	0.1	pCi/L		83	Y	Y			6233483					Uranium-238	

Sample ID: A-185-F
Laboratory Sample ID: F6H160302-004
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.22	0.3	0.10	0.1	pCi/L		60	Y	Y			6233483					Uranium-234	
Uranium-235	0.03	0.053	0.08	0.1	pCi/L	U	60	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	1.1	0.28	0.06	0.1	pCi/L		60	Y	Y			6233483					Uranium-238	

Sample ID: MW-31D-F
Laboratory Sample ID: F6H160302-005
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0	0	0.06	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.009	0.032	0.071	0.1	pCi/L	U	73	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.017	0.029	0.04	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: MW-16S-F
Laboratory Sample ID: F6H160302-006
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.018	0.043	0.069	0.1	pCi/L	U	77	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.003	0.033	0.074	0.1	pCi/L	U	77	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.035	0.043	0.056	0.1	pCi/L	U	77	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: A-275
Laboratory Sample ID: F6H160302-007
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.01	0.25	0.07	0.1	pCi/L		73	Y	Y			6233483					Uranium-234	
Uranium-235	0.081	0.066	0.054	0.1	pCi/L	J	73	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	0.94	0.24	0.05	0.1	pCi/L		73	Y	Y			6233483					Uranium-238	

Sample ID: MW-34S-F
Laboratory Sample ID: F6H160302-008
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.27	0.29	0.05	0.1	pCi/L		77	Y	Y			6233483					Uranium-234	
Uranium-235	0.081	0.067	0.031	0.1	pCi/L	J	77	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	1.29	0.29	0.05	0.1	pCi/L		77	Y	Y			6233483					Uranium-238	

Sample ID: A-275-F
Laboratory Sample ID: F6H160302-009
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.87	0.21	0.07	0.1	pCi/L		80	Y	Y			6233520					Uranium-234	
Uranium-235	0.039	0.053	0.072	0.1	pCi/L	U	80	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.76	0.19	0.05	0.1	pCi/L		80	Y	Y			6233520					Uranium-238	

Sample ID: MW-30S
Laboratory Sample ID: F6H160302-010
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.56	0.16	0.05	0.1	pCi/L		84	Y	Y			6233483					Uranium-234	
Uranium-235	0.011	0.037	0.068	0.1	pCi/L	U	84	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.36	0.13	0.06	0.1	pCi/L		84	Y	Y			6233483					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: MW-31D
Laboratory Sample ID: F6H160302-011
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.03	0.044	0.063	0.1	pCi/L	U	69	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.003	0.027	0.056	0.1	pCi/L	U	69	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.017	0.041	0.067	0.1	pCi/L	U	69	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-38S-F
Laboratory Sample ID: F6H160302-012
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.097	0.07	0.067	0.1	pCi/L	J	76	Y	Y		J	6233483		J		J	Uranium-234	
Uranium-235	0.003	0.031	0.068	0.1	pCi/L	U	76	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.081	0.058	0.042	0.1	pCi/L	J	76	Y	Y		J	6233483		J		J	Uranium-238	

Sample ID: A-235
Laboratory Sample ID: F6H160302-013
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.21	0.29	0.06	0.1	pCi/L		73	Y	Y			6233483					Uranium-234	
Uranium-235	0.053	0.06	0.036	0.1	pCi/L	J	73	Y	Y		U	6233483		U		U	Uranium-235	Sample result is less than the uncertainty
Uranium-238	1.35	0.32	0.05	0.1	pCi/L		73	Y	Y			6233483					Uranium-238	

Sample ID: A-18S
Laboratory Sample ID: F6H160302-014
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.99	0.26	0.07	0.1	pCi/L		72	Y	Y			6233483					Uranium-234	
Uranium-235	0.02	0.043	0.072	0.1	pCi/L	U	72	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	1.21	0.3	0.03	0.1	pCi/L		72	Y	Y			6233483					Uranium-238	

Sample ID: MW-38S
Laboratory Sample ID: F6H160302-015
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.059	0.056	0.065	0.1	pCi/L	U	79	Y	Y		U	6233483		U		U	Uranium-234	
Uranium-235	0	0	0.030	0.1	pCi/L	U	79	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.077	0.057	0.048	0.1	pCi/L	J	79	Y	Y		J	6233483		J		J	Uranium-238	

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Sample ID: MW-16S-U
Laboratory Sample ID: F6H160302-016
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	-0.005	0.024	0.053	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	0.009	0.028	0.056	0.1	pCi/L	U	73	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	-0.002	0.03	0.068	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-36S
Laboratory Sample ID: F6H160302-017
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.118	0.07	0.052	0.1	pCi/L		79	Y	Y			6233483					Uranium-234	
Uranium-235	-0.003	0.025	0.050	0.1	pCi/L	U	79	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.075	0.056	0.047	0.1	pCi/L	J	79	Y	Y		J	6233483		J		J	Uranium-238	

Sample ID: MW-45S-F-D
Laboratory Sample ID: F6H160302-018
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.27	0.11	0.06	0.1	pCi/L		77	Y	Y			6233483					Uranium-234	
Uranium-235	0.011	0.032	0.031	0.1	pCi/L	U	77	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.195	0.094	0.065	0.1	pCi/L		77	Y	Y			6233483					Uranium-238	

Sample ID: MW-49S
Laboratory Sample ID: F6H160302-019
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.108	0.064	0.039	0.1	pCi/L		82	Y	Y			6233483					Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.199	0.089	0.045	0.1	pCi/L		82	Y	Y			6233483					Uranium-238	

Sample ID: MW-45S-F
Laboratory Sample ID: F6H160302-020
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.205	0.096	0.06	0.1	pCi/L		76	Y	Y			6233483					Uranium-234	
Uranium-235	0.009	0.026	0.053	0.1	pCi/L	U	76	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.23	0.1	0.03	0.1	pCi/L		76	Y	Y			6233483					Uranium-238	

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Sample ID: MW-15S
Laboratory Sample ID: F6H160302-021
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.015	0.031	0.052	0.1	pCi/L	U	72	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	0	0	0.030	0.1	pCi/L	U	72	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.015	0.031	0.052	0.1	pCi/L	U	72	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-49S-F
Laboratory Sample ID: F6H160302-022
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.202	0.088	0.047	0.1	pCi/L		97	Y	Y			6233520					Uranium-234	
Uranium-235	0.01	0.028	0.027	0.1	pCi/L	U	97	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.15	0.073	0.036	0.1	pCi/L		97	Y	Y			6233520					Uranium-238	

Sample ID: DUP01-F
Laboratory Sample ID: F6H160302-023
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.8	0.2	0.06	0.1	pCi/L		93	Y	Y			6233520					Uranium-234	
Uranium-235	0.016	0.033	0.056	0.1	pCi/L	U	93	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.72	0.19	0.02	0.1	pCi/L		93	Y	Y			6233520					Uranium-238	

Sample ID: MW-32S
Laboratory Sample ID: F6H160302-024
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.68	0.18	0.060	0.1	pCi/L		84	Y	Y			6233520					Uranium-234	
Uranium-235	0.074	0.061	0.029	0.1	pCi/L	J	84	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	0.67	0.18	0.050	0.1	pCi/L		84	Y	Y			6233520					Uranium-238	

Sample ID: New Well #2-F
Laboratory Sample ID: F6H160302-025
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.038	0.04	0.045	0.1	pCi/L	U	82	Y	Y		U	6233520		U		U	Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0	0	0.02	0.1	pCi/L	U	82	Y	N		U	6233520		U		U	Uranium-238	

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Sample ID: MW-19S
Laboratory Sample ID: F6H160302-026
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.12	0.28	0.07	0.1	pCi/L		63	Y	Y			6233520					Uranium-234	
Uranium-235	0.081	0.073	0.037	0.1	pCi/L	J	63	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	1.4	0.33	0.06	0.1	pCi/L		63	Y	Y			6233520					Uranium-238	

Sample ID: MW-19S-F
Laboratory Sample ID: F6H160302-027
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.11	0.27	0.05	0.1	pCi/L		68	Y	Y			6233520					Uranium-234	
Uranium-235	0.084	0.068	0.057	0.1	pCi/L	J	68	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	1.14	0.27	0.06	0.1	pCi/L		68	Y	Y			6233520					Uranium-238	

Sample ID: MW-15S-F
Laboratory Sample ID: F6H160302-028
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.072	0.06	0.059	0.1	pCi/L	J	70	Y	Y		J	6233520		J		J	Uranium-234	
Uranium-235	-0.003	0.028	0.056	0.1	pCi/L	U	70	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.025	0.037	0.053	0.1	pCi/L	U	70	Y	N		U	6233520		U		U	Uranium-238	

Sample ID: A-22S-F
Laboratory Sample ID: F6H160302-029
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.1	0.28	0.07	0.1	pCi/L		66	Y	Y			6233520					Uranium-234	
Uranium-235	0.04	0.053	0.036	0.1	pCi/L	J	66	Y	N	E	U	6233520		U		U	Uranium-235	Sample result is less than the uncertainty
Uranium-238	0.88	0.24	0.08	0.1	pCi/L		66	Y	Y			6233520					Uranium-238	

Sample ID: New Well #1-F
Laboratory Sample ID: F6H160302-030
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	2.52	0.47	0.04	0.1	pCi/L		76	Y	Y			6233520					Uranium-234	
Uranium-235	0.157	0.089	0.052	0.1	pCi/L		76	Y	Y			6233520					Uranium-235	
Uranium-238	1.78	0.36	0.05	0.1	pCi/L		76	Y	Y			6233520					Uranium-238	

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Sample ID: A-235-F
Laboratory Sample ID: F6H160302-031
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.23	0.28	0.06	0.1	pCi/L		77	Y	Y			6233520					Uranium-234	
Uranium-235	0.031	0.042	0.052	0.1	pCi/L	U	77	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	1.18	0.27	0.02	0.1	pCi/L		77	Y	Y			6233520					Uranium-238	

Sample ID: A-24S-U
Laboratory Sample ID: F6H160302-032
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.5	0.21	0.09	0.1	pCi/L		40	Y	Y			6233520					Uranium-234	
Uranium-235	0	0	0.06	0.1	pCi/L	U	40	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.39	0.18	0.09	0.1	pCi/L		40	Y	Y			6233520					Uranium-238	

Sample ID: A-22S
Laboratory Sample ID: F6H160302-033
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.95	0.24	0.09	0.1	pCi/L		71	Y	Y			6233520					Uranium-234	
Uranium-235	0.05	0.056	0.069	0.1	pCi/L	U	71	Y	Y		U	6233520		U		U	Uranium-235	
Uranium-238	0.96	0.24	0.06	0.1	pCi/L		71	Y	Y			6233520					Uranium-238	

Sample ID: MW-45-S
Laboratory Sample ID: F6H160302-034
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.147	0.074	0.049	0.1	pCi/L		92	Y	Y			6233520					Uranium-234	
Uranium-235	0.002	0.025	0.057	0.1	pCi/L	U	92	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.206	0.085	0.035	0.1	pCi/L		92	Y	Y			6233520					Uranium-238	

Sample ID: MW-17S
Laboratory Sample ID: F6H160302-035
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.31	0.11	0.04	0.1	pCi/L		104	Y	Y			6233520					Uranium-234	
Uranium-235	0.018	0.031	0.024	0.1	pCi/L	U	104	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.31	0.1	0.03	0.1	pCi/L		104	Y	Y			6233520					Uranium-238	

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Sample ID: MW-32S-F
Laboratory Sample ID: F6H160302-036
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.54	0.16	0.06	0.1	pCi/L		81	Y	Y			6233520					Uranium-234	
Uranium-235	0.024	0.042	0.063	0.1	pCi/L	U	81	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.73	0.19	0.04	0.1	pCi/L		81	Y	Y			6233520					Uranium-238	

Sample ID: New Well #1-U
Laboratory Sample ID: F6H160302-037
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	2.19	0.42	0.05	0.1	pCi/L		88	Y	Y			6233520					Uranium-234	
Uranium-235	0.066	0.059	0.03	0.1	pCi/L	J	88	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	2.06	0.4	0.04	0.1	pCi/L		88	Y	Y			6233520					Uranium-238	

Sample ID: MW-17S-F
Laboratory Sample ID: F6H160302-038
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.187	0.091	0.062	0.1	pCi/L		87	Y	Y			6233520					Uranium-234	
Uranium-235	-0.006	0.028	0.060	0.1	pCi/L	U	87	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.29	0.11	0.020	0.1	pCi/L		87	Y	Y			6233520					Uranium-238	

Sample ID: MW-36S-F
Laboratory Sample ID: F6H160302-039
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.174	0.088	0.064	0.1	pCi/L		80	Y	Y			6233520					Uranium-234	
Uranium-235	0.011	0.031	0.030	0.1	pCi/L	U	80	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.129	0.073	0.047	0.1	pCi/L		80	Y	Y			6233520					Uranium-238	

Sample ID: MW-39S-F
Laboratory Sample ID: F6H160302-040
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.29	0.11	0.040	0.1	pCi/L		83	Y	Y			6233520					Uranium-234	
Uranium-235	0.029	0.038	0.047	0.1	pCi/L	U	83	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.167	0.08	0.023	0.1	pCi/L		83	Y	Y			6233520					Uranium-238	

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Sample ID: A-21S
Laboratory Sample ID: F6H160302-041
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.02	0.26	0.05	0.1	pCi/L		65	Y	Y			6236379					Uranium-234	
Uranium-235	0.077	0.068	0.061	0.1	pCi/L	J	65	Y	Y		J	6236379		J		J	Uranium-235	
Uranium-238	0.98	0.25	0.06	0.1	pCi/L		65	Y	Y			6236379					Uranium-238	

Sample ID: A-24S-F
Laboratory Sample ID: F6H160302-042
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.18	0.088	0.049	0.1	pCi/L		74	Y	Y			6236379					Uranium-234	
Uranium-235	-0.006	0.028	0.061	0.1	pCi/L	U	74	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.209	0.094	0.042	0.1	pCi/L		74	Y	Y			6236379					Uranium-238	

Sample ID: MW-39S
Laboratory Sample ID: F6H160302-043
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.211	0.097	0.044	0.1	pCi/L		72	Y	Y			6236379					Uranium-234	
Uranium-235	0.024	0.042	0.033	0.1	pCi/L	U	72	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.211	0.096	0.044	0.1	pCi/L		72	Y	Y			6236379					Uranium-238	

Sample ID: MW-45S-D
Laboratory Sample ID: F6H160302-044
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.194	0.089	0.024	0.1	pCi/L		79	Y	Y			6236379					Uranium-234	
Uranium-235	0.011	0.031	0.030	0.1	pCi/L	U	79	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.194	0.089	0.024	0.1	pCi/L		79	Y	Y			6236379					Uranium-238	

Sample ID: A-21S-F
Laboratory Sample ID: F6H160302-045
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.96	0.24	0.06	0.1	pCi/L		72	Y	Y			6236379					Uranium-234	
Uranium-235	0.112	0.08	0.034	0.1	pCi/L		72	Y	Y			6236379					Uranium-235	
Uranium-238	0.87	0.23	0.05	0.1	pCi/L		72	Y	Y			6236379					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: New Well #2
Laboratory Sample ID: F6H160302-046

Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.021	0.028	0.035	0.1	pCi/L	U	89	Y	N		U	6236379		U		U	Uranium-234	
Uranium-235	-0.002	0.021	0.043	0.1	pCi/L	U	89	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.006	0.017	0.035	0.1	pCi/L	U	89	Y	N		U	6236379		U		U	Uranium-238	

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Soil Samples
SDG # F6H170372

Data Package Summary

- There were two (2) samples in the sample delivery group (work order). The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis of isotopic thorium by alpha spectrometry.

Sample Cross Reference

Sample ID	Laboratory Sample ID
GP230506	F6H170372-001
GP730506	F6H170372-002

Data Deliverables Completeness

- All required information was provided.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- There were no matrix spike or matrix spike duplicate samples analyzed for this sample delivery group.
- There was a method blank detection of Th-230 in the isotopic thorium batch.

Sample Deviations

- No individual sample deviations were noted.

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
GP230506	Th-228	0.96		
	Th-230	2.1		
	Th-232	0.93		
GP730506	Th-228	0.75		
	Th-230	1.44		
	Th-232	0.8		

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6H170372

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Earth Tech, Inc.
Address (City/State): Bloomfield, NJ

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 8/17/2006
Date of Data Package: 8/22/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 9/25/2006
Validation by: [redacted] Date: 9/26/2006

Parameters	Instrumentation
Thoruim 228	Alpha spec
Thorium-230	
Thorium-232	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	320215, 320216, 320217
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	N
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

F6H170372.xls
Date Printed: 9/28/2006

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6230395	Th-228	F6H180000-395B			F6H170372-001	3						
6230395	Th-230	F6H180000-395B	.041J	B+		6			F6H180000-395C	91		
6230395	Th-232	F6H180000-395B				0.8						

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6230395	Th-228	No MS				No MSD								
6230395	Th-230	No MS				No MSD								B+
6230395	Th-232	No MS				No MSD								

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6H170372
Severn Trent (STL) St. Louis

Sample ID: GP230506
Laboratory Sample ID: F6H170372-001
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.96	0.2	0.04	0.1	pCi/g		88	Y	Y			6230395					Thoruim 228	
Thorium-230	2.1	0.38	0.03	0.1	pCi/g		88	Y	Y			6230395			B+		Thorium-230	Sample result is greater than five times the blank result
Thorium-232	0.93	0.2	0.02	0.1	pCi/g		88	Y	Y			6230395					Thorium-232	

Sample ID: GP730506
Laboratory Sample ID: F6H170372-002
Sample Collection Date: 8/3/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Thoruim 228	0.75	0.17	0.04	0.1	pCi/g		94	Y	Y			6230395					Thoruim 228	
Thorium-230	1.44	0.27	0.03	0.1	pCi/g		94	Y	Y			6230395			B+		Thorium-230	Sample result is greater than five times the blank result
Thorium-232	0.8	0.17	0.02	0.1	pCi/g		94	Y	Y			6230395					Thorium-232	

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Water Samples
SDG # F6I280110

Data Package Summary

- There were two (2) samples in the sample delivery group (work order). The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis including isotopic uranium by alpha spectrometry. This SDG was created because the laboratory did not analyze the required MS and MSD samples with the original analytical batch (see report for SDG F6H160302). Therefore, these primary samples have already been validated under that SDG. They are presented here only for completeness. It is recommended that the results from the original SDG be used as these will only be considered as confirmatory.

Sample Cross Reference

Sample ID	Laboratory Sample ID
A-275	F6I280110-001
A-275F	F6I280110-002

Data Deliverables Completeness

- All required information was provided. Note: the laboratory data package lists the sample collection date as 9/26/06, but it is actually 7/26/06.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- None

Sample Deviations

- None

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
A-275	U-234	0.99		
	U-235	0.052	J	J
	U-238	0.86		
A-275F	U-234	0.72		
	U-235	0.091	J	J
	U-238	0.71		

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6I280110

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Cabrera Services
Address (City/State): Middletown, NY

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 9/28/2006
Date of Data Package: 10/2/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 10/16/2006
Validation by: [redacted] Date: 10/16/2006

Parameters	Instrumentation
Uranium-234	Alpha spec
Uranium-235	
Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	Joslyn-01
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	Y
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

F6I280110.xls
Date Printed: 10/16/2006

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6271495	U-234	F6I280000-495B							F6I280000-495C	110		
6271495	U-235	F6I280000-495B										
6271495	U-238	F6I280000-495B							F6I280000-495C	106		

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6271495	U-234	F6I280110-001	97			F6I280110-001	104	6						
6271495	U-235													
6271495	U-238	F6I280110-001	102			F6I280110-001	105	2						
	U-234	F6I280110-002	108			F6I280110-002	105	3						
	U-235													
	U-238	F6I280110-002	107			F6I280110-002	105	1						

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6I280110
Severn Trent (STL) St. Louis

Sample ID: A-275
Laboratory Sample ID: F6I280110-001
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.99	0.21	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-234	
Uranium-235	0.052	0.051	0.028	0.1	pCi/L	J	85	Y	Y		J	6271495		J		J	Uranium-235	
Uranium-238	0.86	0.2	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-238	

Sample ID: A-275-F
Laboratory Sample ID: F6I280110-002
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.72	0.17	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-234	
Uranium-235	0.091	0.064	0.027	0.1	pCi/L	J	85	Y	Y		J	6271495		J		J	Uranium-235	
Uranium-238	0.71	0.17	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-238	

US Army Corps of Engineers®
Buffalo District

Site Inspection Report

Appendix C

Water Report

Joslyn Manufacturing Site
Fort Wayne, Indiana

Prepared by:

U.S. Army Corps of Engineers,
Buffalo District
Date: 1 May 2007

US Army Corps
of Engineers
Buffalo District

Groundwater Sampling Results

In-House Groundwater Sampling Under Site Investigation

Authorized under FUSRAP

Joslyn Manufacturing and Supply Company Site
Fort Wayne, Indiana

Prepared by:
U.S. Army Corps of Engineers Buffalo District
1776 Niagara Street
Buffalo, N.Y. 14207

December 2006

EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) performed a Site Investigation (SI) on the Joslyn Manufacturing and Supply Company site (Joslyn Site), located at 2400 Taylor Street in Fort Wayne, Indiana. The SI was performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The U.S. Department of Energy (DOE) determined that the site is eligible for inclusion into the FUSRAP. The Preliminary Assessment (PA) compiled in 2005 concluded that no imminent threat to human health or the environment exists but the site should undergo further investigation. The USACE contracted EarthTech to perform SI-level soil sampling and the USACE performed all groundwater sampling for radiologic contamination at the Joslyn Site.

The Site Investigation (SI) based groundwater sampling at the Joslyn Site was recommended in the site Preliminary Assessment, which indicated the presence of historic contract-related (via University of Chicago) contamination. The historical data were reviewed and evaluated as screening-level data to provide general information to help focus the SI sampling effort.

Groundwater data were collected to meet preliminary groundwater-specific Data Quality Objectives (DQOs) common to previous screening-level FUSRAP efforts. A single groundwater sampling effort occurred prior to the soil sampling performed by Earth Tech personnel. Buffalo District personnel abided by all general and safety plans, such as USACE 385-1-1 Safety and Health Manual and LRB 385-1-1 Safety and Health Regulation, and site-specific plans developed by Earth Tech.

The field work (groundwater sampling) was conducted from 24-July-2006 to 01-Aug-2006. The intended result of this groundwater sampling effort is the determination of whether radiologic contaminants have leached to groundwater and migrated towards off-site receptors. Preliminary DQOs guided the sampling, analysis and data-evaluation phases. The SI-phase analytical and field characterization results were used to identify whether additional field sampling and data collection activities are required for the Joslyn Site under the CERCLA process.

The SI groundwater data do not indicate a release of radiologic constituents to site groundwater, which may preclude the need for future investigation and modeling. Groundwater sampling results from four background/upgradient wells are summarized below:

- Uranium-234: Data range = 0.12 to 1.27 pCi/L, averaging 0.40 pCi/L
- Uranium-235: Data range = 0.0 to 0.08 pCi/L, averaging 0.02 pCi/L
- Uranium-238: Data range = 0.08 to 1.38 pCi/L, averaging 0.41 pCi/L

Groundwater sampling results from 17 site well are summarized below:

- Uranium-234: Data range = 0.01 to 2.52 pCi/L, averaging 0.67 pCi/L
- Uranium-235: Data range = -0.01 to 0.16 pCi/L, averaging 0.03 pCi/L
- Uranium-238: Data range = 0.0 to 2.06 pCi/L, averaging 0.63 pCi/L

This summary indicates that site data is similar to background and below the equivalent USEPA maximum contaminant level (MCL) and Region IX Preliminary Remediation Goals (PRGs) for mass-based total uranium. The SI report will present a site-specific exposure risk evaluation for groundwater and thus final recommendations. This data collection program and evaluation document lists all analytical results, discussions, and preliminary conclusions.

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APPENDICES

ACRONYMS, FORMULAS, AND SYMBOLS

AEC	Atomic Energy Commission
AOC	Area of Concern
Bgs	Below-ground Surface
cpm	counts per minute
CFR	Code of Federal Regulations
COC	Chain of Custody
COPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DMP	Data Management Plan
DoD	Department of Defense
DOE	Department of Energy
DQA	Data Quality Assessment
DQCR	Daily Quality Control Report
DQO	Data Quality Objective
Eh	Redox potential (millivolts)
EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
FSA	Field Staging Area
FSP	Field Sampling Plan
ft	Feet
FUSRAP	Formerly Utilized Sites Remedial Action Program
GIS	Graphical Information System
HTRW	Hazardous, Toxic, Radioactive Waste
IDEM	Indiana Department of Environmental Management
IDW	Investigation-Derived Waste
MDC	Minimum Detectable Concentration
MDL	Method Detection Limits
MED	Manhattan Engineer District
amsl	Above Mean sea level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NTU	Nephelometric Turbidity Unit
ORP	Oxidation-Reduction Potential
pH	Potential of Hydrogen
PID	Photoionization Detector
PPE	Personal Protective Equipment
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCP	Quality Control Plan
RCRA	Resource Conservation and Recovery Act
RSO	Radiation Safety Officer
SI	Site Investigation
SSHM	Site Safety and Health Manager
SSHP	Site Safety and Health Plan
SSHO	Site Safety and Health Officer
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act

TSDF	Treatment, Storage and Disposal Facilities
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey
VOCs	Volatile Organic Compound

1.0 SITE BACKGROUND

Groundwater sampling for the Joslyn-Site SI investigated potential impacts from radiologic contaminants found in site soil. The field sampling plan (FSP) guided the field and laboratory requirements for the program (USACE 2006). An EarthTech developed Quality Assurance Project Plan (QAPP), a Site Safety and Health Plan (SSHP), and Radiation Protection Plan (RPP) provided USACE sampling personnel with site-specific guidance for the groundwater sampling task. The FSP contains a brief description of the SI approach, rationale, procedures, quality assurance and control (QA/QC) program, and the data handling program for groundwater sampling activities.

The PA performed by the USACE of the Joslyn Site followed the process outlined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). The site information review performed for the PA determined the need for further action by USACE under the Formerly Utilized Sites Remedial Action Program (FUSRAP) in order to ensure the protection of human health and the environment.

An outdoor area that the current site owner indicates was used to burn operational waste also shows soil contamination ranging from 2.12 pCi/g to 75.6 pCi/g total uranium (summed from uranium-235 and uranium-238 values). Down-hole gamma scans produced values ranging from 2230 counts per minute (cpm) to 21,450 cpm at depths nearing the groundwater table (USACE 2005), which prompted the groundwater sampling effort to determine whether MED/AEC related contaminants at the Joslyn site were released to and are mobile in the environment.

1.1 SITE LOCATION

The former Joslyn Manufacturing and Supply Co. is located in Allen County, Indiana and currently managed as the Fort Wayne Specialty Steel Corporation (Fort Wayne Steel). The site is located in an industrial setting at 2400 Taylor St (see excised property in Figure 1 of the Field Sampling Plan or FSP [USACE 2006]). The Joslyn Site is bounded by a Norfolk & Southern Railroad to the north, Taylor St. to the south, Slater Steel and Junk Ditch (a small stream) to the west, and commercial/industrial properties to the east. There are also several residential, commercial, and industrial business areas within less than one mile from the site e.g. churches, schools, and commercial business. Swinney Park is found northeast of the site and features a community recreation area with surface water bodies.

1.2 SITE HISTORY

From 1944-1949, Joslyn Manufacturing and Supply Co. was engaged by the University of Chicago under contract 7401-37-9 to roll and machine uranium rods from billets. This process included heating, straightening, threading, and grinding the billets.

The contractual service is outlined below:

- Subcontract Number 7401-37-9 entered on 15 August 1943 with the University of Chicago (U of C) was renewed annually until June 30, 1946. Under this contract, Joslyn Manufacturing and Supply Co. performed tempering, hot rolling, quenching, straightening, cooling, grinding, abrasive cutting, waste burning and threading of natural uranium billets (U-billets) into metal rods.

- Additional documents indicate that the Joslyn Manufacturing and Supply Co. fabricated approximately 15 tons of uranium rods for the British and Canadian Governments beginning in August 1946.
- Documentation also exists that indicates that Joslyn Manufacturing and Supply Co. continued to roll uranium rods until at least 1949 under a University of Chicago contract.

During the period of University of Chicago contracted operations at the Joslyn Site, the facility was not subject to specific regulatory requirements other than those outlined by specific contracts or security procedures (as with other industrial facilities of the period). Consequently, the Joslyn Manufacturing and Supply Co. was not subject to government mandated environmental, radiological, or hazardous waste requirements although operational material, equipment, and health & safety requirements were administered by the MED and Atomic Energy Commission (AEC).

The Joslyn FUSRAP site now is an excised property owned by Valbruna Steel of Italy, who operates Slater Stainless Steel, Inc. in facilities adjacent to and west of Fort Wayne Specialty Steel, Inc. (the former Joslyn-site plant). Valbruna of Italy specializes in the production of stainless steel and hot and cold finished bars at Slater Stainless Steel, Inc., which occupies approximately 40 acres west of the Joslyn building 10. (See Figure 1 of the FSP [UASCE 2006].)

The Fort Wayne Specialty Steel (or Joslyn) facility occupies approximately 23 acres east of and including building 9. This site includes approximately eleven (11) buildings, five (5) of which were present during U of C contracted operations. The site continued to develop after the cessation of U of C contracted operations with new buildings and additions to buildings used during U-billet shaping operations. The Joslyn Site is separated from the Valbruna site by a chain link fence and access is limited to a few site personnel that include security guards, the plant manager, and the site health and safety officer. The site for the most part is covered either in buildings, concrete, asphalt, or stone, with very little vegetation in the areas of interest.

Figure 1 of the USACE FSP depicts the general property lines between the operations (Valbruna and Fort Wayne or Joslyn Sites).

1.3 PREVIOUS INVESTIGATIONS

Radiological surveys of the former Joslyn Manufacturing and Supply Co. were performed in 1949, 1976, 2004, and 2005. These surveys are detailed in the USACE PA (USACE 2005).

The 2004 investigation by Radiation Safety Services Incorporated (RSSI) performed direct instrument surveys, bulk sampling, borehole investigations, and soil sampling (see USACE 2005, Attachment F). This survey concluded that subsurface soil contamination was present where AEC-related activities were reported to have occurred, especially in a suspected waste burn area where elevated survey readings and collocated soil samples showed suspect contamination. See the PA (USACE 2005) for tabular data.

In addition, Fort Wayne Specialty Steel opearted a groundwater remediation system (electrocatalytic thermal desorption) to extract a trichloroethene (TCE) plume in groundwater under the Joslyn property. This voluntary remedial program was negotiated with the Indiana Department of Environmental Management (IDEM) and includes a monitoring well network installed throughout the 1990s and early 2000s. This network was used to assess the site for isotopic uranium in groundwater. The wells were last sampled in late 2003 as part of a routine monitoring program and a performance assessments of the remediation system, which was decommissioned in January, 2006.

2.0 PHYSICAL SETTING AND GEOLOGY

The Joslyn Site is within the City of Fort Wayne, Indiana and lies southwest of the confluence of Junk Ditch with the St. Marys River within their 100-year floodplains. Topography is relatively flat, with a slope of less than 0.5% toward the northeast. The elevation at the site ranges from approximately 755 feet above mean sea level (amsl) throughout most of the site to approximately 750 feet amsl along Junk Ditch. The railroad tracks adjacent to the site are elevated to approximately 760 ft amsl.

The Joslyn Site is located on the Bluffton Till Plain region of the Central Till Plain physiographic province of Indiana, which is a poorly drained upland interrupted by incised stream and river valleys. The SSURGO Soil Survey of Allen County, Indiana (USDA 1980) classifies site soils as the Lenawee silty clay loam. This two- to three-foot thick lacustrine derived soil can contain up to 50% clay, which develops into a poorly drained soil of moderately low permeability (<1E-3 cm/s) with high water capacity (up to 10 inches in top 60 inches) and organic matter (3% to 6%). This soil appears commonly buried under fill material installed for grading and leveling the industrial property.

The regional setting is underlain by up to 80 feet of Pleistocene glacial tills, coarse-grained glaciofluvial deposits, alluvial sediments, glaciolacustrine sediments, and Recent floodplain and channel deposits of local rivers. The site and nearby properties are underlain by up to 70 feet of variably textured sand and gravel deposits interrupted by discontinuous clay layers that together overly the Trafalgar Till (a heterogeneous and poorly sorted diamict). This till unconformably overlies the upper Devonian Traverse Formation of the Muscatatuck Group, which consists of a variety of groundwater producing limestones, dolomite, and thin shale beds. The Traverse Formation exhibits a weathered erosional surface at the glacial overburden contact. See the Indiana Geologic Survey at: (http://igs.indiana.edu/geology/structure/compendium/html/comp4z6s.cfm).

The sand and gravel deposts are interrupted by one- to fifteen-foot thick clay layers in the western part of the site, which pinch out to the east where undifferentiated outwash deposits dominate the St. Marys River floodway.

The coarse-grained glaciofluvial deposits above the Trafalgar Till constitute the primary water-bearing unit in the unconsolidated portion of the subsurface. The unconsolidated deposits below the Joslyn Site vertically grade from a silty or clayey sand (or silt) with fill (3-10 ft. thick) to a poorly sorted silty sand, and then to a thicker package of poorly to well sorted layers of sand that grade to well sorted gravel towards the east and northeast. These coarser-grained units are known collectively as the unconsolidated Atherton Formation.

2.1 Hydrogeology

The due-diligence voluntary remediation program for organic contamination negotiated by Valbruna Steel with IDEM installed over 80 monitoring wells and discrete sampling points throughout the Valbruna and Joslyn properties. Boring log data from the Atherton aquifer show alternating layers of variably textured sand and gravel containing discontinuous clay and silt lenses and sheets that are more continuous in the western site area, possibly producing two hydraulically separate coarse-grained units. The Atherton is more vertically continuous in the eastern site. The general groundwater flow is easterly towards the St. Marys River.

Hydraulic conductivity data were not provided by site owners, although the coarse-grained nature of the Atherton aquifer indicates values are likely indicative of sand and gravel ranges (e.g., 0.001 to 0.1 cm/s, or 2.8 to 280 ft/d). This likely high permeability indicates that local groundwater resources can easily

support domestic and industrial groundwater production rates, as well as high contaminant transport rates. The yields and minimal drawdown exhibited during site groundwater sampling supports this speculation.

Details on the hydrogeologic setting are presented in the FSP (USACE 2006).

2.1.1 Ground Water Pathways

The soil boring data (coarse-grained soil textures), downhole gamma logging (deeper detections), and soil samples (vertically gradational uranium concentrations) together indicate that the near-surface fill and underlying glacio-lacustrine to outwash aquifer below the site may promote the leaching of uranium to groundwater. The SI-based soil sampling results confirm that near-surface soil contamination exists in the burn area, although not at depth (> 2 feet).

The records reviewed for this groundwater sampling phase of the SI include:

- Quarterly groundwater monitoring reports designed to track chemical contamination, specifically TCE and related compounds, in site groundwater;
- Remediation Work Plan, Fort Wayne Steel Corp, May 2005, which compiled previous and design-related data into a summary document that presented the final design for an on-site, in-situ electrical resistance heating and vapor recovery system (Clayton 2005).

These documents indicate the primary groundwater flow and transport pathways on the site (via plumes), which were used by USACE to optimize the sampling locations for radiologic contaminants of potential concern (COPCs) without having to collect supporting geochemical information or other physical groundwater flow data for the SI. The presence of on-site to off-site metals and organic compound plumes provided insight to possible uranium transport pathways.

The mobility of uranium can depend on water pH, redox potential, organic carbon, uranium speciation, and soil-partitioning coefficients. Site-owner data previously collected for the organic contaminant remedial design include pH, Oxidation-Reduction Potential (ORP) or Redox potential (Eh), Temperature, Dissolved Oxygen, organic compounds (volatile and semi-volatile), and Target Analyte List (TAL) metals.

The sampling of site groundwater downgradient of soil contamination areas, the speciation of uranium in mobile U+6 species (via pH and Eh data indicating oxidizing conditions), and the high permeability of the aquifer all indicate that groundwater is a candidate exposure pathway. These data and conditions were assumed during the planning phase and thus 22 candidate locations for groundwater sampling were chosen, although only 21 were sampled, as seen on Figure 1 and listed in Table 1.

3.0 PROJECT SCOPE AND OBJECTIVES

The USACE FSP described project objectives, tasks, and the project schedule (USACE 2006). These items are reviewed briefly for completeness.

3.1 PROJECT OBJECTIVES

The principal goal of the groundwater sampling was to determine the presence or absence of AEC/MED-related radiological contamination at the Joslyn Site. The sampling allowed USACE to meet the following groundwater goals:

- Determine if radiologic contamination resulting from MED/AEC activities is present in site groundwater;
- Acquire information to define the likely fate and transport of MED/AEC contaminants from the site;
- Gather sufficient data to determine whether MED/AEC contaminants may constitute a threat to human health or the environment;
- Provide sufficient characterization data to allow completion of subsequent Site Investigation documents.

3.2 TASK DESCRIPTION

Groundwater was collected at the Joslyn Site for constituents related to MED operations. The groundwater sampling approach (number and type of samples) was based on the location of known and suspected radiologically impacted areas. Several upgradient and downgradient wells locations were included to ensure site coverage and representative background conditions were assessed. The sampling activities provided enough data to determine that MED-related groundwater contamination does not exists above screening levels at the site.

4.0 GROUNDWATER DATA QUALITY OBJECTIVES

The SI-level groundwater data quality objectives (DQOs) listed in the FSP were structured according to EM 200-1-2 *Technical Project Planning Process* (USACE 1998), which incorporates the basic components of the seven-step DQO process described in *Guidance for the Data Quality Objective Process* (USEPA 1994).

The SI-phase groundwater DQOs to screen for MED-related contaminants include:

- Identify the current project
- Determine project data needs
- Develop data collection options
- Finalize the data collection program.

The four phases are detailed in the FSP and are briefly summarized below.

4.1 IDENTIFY THE CURRENT PROJECT

Site-specific information gathered during the PA indicate that specific U of C contracts with Joslyn Steel involved radiologic materials handling and potential waste-product burning. The groundwater investigation was focused on detecting isotopic uranium in groundwater (both total and dissolved fractions) at 21 wells.

Chemicals commonly used in metal processing were not sampled since they were not unique to the MED-related processes.

4.2 DETERMINE DATA NEEDS

Site-specific data were needed to identify whether radiologic constituents in groundwater exceeded screening levels in the unconsolidated saturated zones east of Junk Ditch and west of General Electric properties.

Site Investigation recommendations and future activities will be based on these data. The groundwater data were validated under EPA Level 2 protocols to support the future CERCLA decisions regarding environmental release and human health risk.

4.3 DEVELOP DATA COLLECTION OPTIONS

SI-based groundwater samples from existing site wells were obtained using CERCLA practices (low-flow sampling) and USACE guidance (EM-1110-1-4000, Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites).

The data collection methods (low-flow peristaltic extraction under clean-equipment conditions) were suitable for risk-based groundwater screening. Groundwater analytical methods employed for this SI effort are listed in Table 4 of the FSP (USACE 2006).

4.4 DATA COLLECTION PROGRAM

The groundwater samples were collected based on historical soil information (radiologic) and groundwater chemistry data supplied by the site owner. The rationale, radiologic anlytes, sample locations, and total number of samples were articulated in Tables 1 through 3 of the FSP (USACE 2006). Uranium-234, uranium-235, and uranium-238 (U-234, U-235, and U-238, respectively) were analyzed by Severn Trent Labs (STL) under a 45-day turn-around contract. The QA/QC samples also were sent to Paragon Analytics laboratory under a 45-day turn-around contract. The alpha-spectroscopy method (DOE EML HASL-300, Th-01-RC Modified) was used to determine isotopic uranium results of all samples, which met DQO needs.

Three background (upgradient) wells and one cross-gradient well were sampled for isotopic uranium (see Figure 1).

On-site sample locations were chosen to provide data that will satisfy observational SI needs and minimize, to the extent possible, laboratory analytical costs. The field sampling and laboratory analysis methods used for the Joslyn-site SI meet Corps standards and CERCLA requirements for risk assessments and site characterization reports. The data are considered definitive and of CERCLA-use quality (useable in a baseline risk assessment and decision documents).

To obtain sample results that can 1) meet preliminary DQOs, 2) can be compared to MCLs, 3) be used in screening-level risk assessments (human and ecological), and 4) be used in future studies, if required, laboratory detection levels for radionuclides were contracted to a critical detection level of 0.1 pCi/L for isotopic uranium (U-234, U-235, U-238) by alpha-spectroscopy method.

Investigation derived waste was sampled after the SI fieldwork phase was completed. Liquid IDW grab samples were analyzed for the constituents listed in Table 4 of the FSP (USACE 2006). The liquid IDW was dispositioned by Earth Tech and a disposal manifest was signed by a permitted USACE representative.

4.4.1 Background Groundwater

Background (or upgradient) groundwater samples collected from three wells located in the western portion of the Valbruna Steel property (Figure 1) are distal to the radiologic operations area. Background samples were analyzed for isotopic uranium, both total and filtered fractions.

The well cross-gradient of the site was originally grouped within "site" wells, although is generally upgradient of the area of concern. Isotopic uranium data from this well are grouped into the background or upgradient dataset to enhance the statistical analysis of the data.

4.4.2 Site Groundwater

The groundwater data collection program included static water-level measurements and field parameter sets recorded during the low-flow sampling of monitoring wells, which provided definitive data for use in the SI.

Static water level measurements were collected from all existing monitoring wells prior to the sampling event; these levels were used to observe and minimize drawdown during sampling. Existing potentiometric maps provided by the site owner indicate groundwater flow directions during a variety of seasons; this effort was not assembled for the SI and general flow directions are considered easterly (see Figure 5 of the FSP [USACE 2006]).

Results from the groundwater sampling event were compared to the background dataset, the EPA MCL of 30 micrograms per liter (µg/L), and the EPA Region IX PRG for tap water of 7.3 µg/L for total (mass) uranium. The isotopic U values in pCi/L were converted to mass-equivalent uranium values in µg/L by multiplying the U-238 value in pCi/L by three (3).

5.0 SITE INVESTIGATION FIELD PROCEDURES

Field paramters were collected and used to determine when each well was producing representative groundwater (i.e., stabilized). Once data stabilized according to the requirements in the FSP, samples were collected (USACE 2006).

Data quality controls used for the groundwater sampling effort included two field duplicate samples and one field QA split sample for field quality control purposes, as well as one set of matrix-spike/matrix-spike duplicates (MS/MSD) for laboratory quality control purposes. Additional data quality criteria are listed in the FSP (USACE 2006)

The existing array of monitoring wells were installed according to industry-standard specifications and used to collect definitive data for a site-specific voluntary action program to address an organic contamination source area. Reports provided by the site owners indicate that the well were installed in compliance with EM-1110-1-4000, Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites (USACE 2006).

6.0 FIELD MEASUREMENT AND SAMPLING PROCEDURES

Groundwater field measurements collected during the sampling event include static water levels, potential of hydrogen (pH), specific conductance, dissolved oxygen, turbidity, oxygen reduction potential, and temperature; these were recorded in according to field measurement criteria listed

in the FSP (USACE 2006). Field measurement instruments were calibrated daily in accordance with manufacturer instructions or requirements.

The measurement of initial static groundwater levels within all sampled monitoring wells was made using an electronic water level indicator in accordance with EM 1110-1-4000 Chapter 8, *Water Levels*. This level was measured throughout the sampling of each well to minimize drawdown; flow rates were adjusted to produce less than one foot of drawdown.

Collection of groundwater samples from monitoring wells included: (1) well purging, (2) measurement and stabilization of field parameters, and (3) groundwater sample collection. Groundwater sampling activities will follow the requirements of *EM 200-1-3 C.2 Groundwater Sampling*.

The purging and sampling of monitoring wells was accomplished using a GeoPump 3200 peristaltic pump attached to disposable Teflon sample tubing. Water quality parameters were measured using a flow-through cell equipped with and a Hydrolab Water Quality Sonde MS connected to a Hydrolab Handheld Surveyor (water-quality read-out meter). All wells accepted the sampling tubes and provide sufficient recharge rates to accommodate the low-flow micropurging and sampling (<100 mL/minute) in accordance with EM 200-1-3 C.2.4.9 and the FSP (USACE 2006).

Nearly all well stabilized during the first hour of micropurging or the equivalent of 2.0 to 2.5 gallons. Once stabilized according to the FSP requirements, the tubing from the well was disconnected from the flow-through cell and groundwater samples were collected for total (unfiltered) and dissolved (field-filtered) isotopic uranium analyses (USACE 2006).

All filled sample containers were labeled and preserved at 4°C (±2°C) immediately after collection by placing the sample in a cooler with wet ice. The samples were maintained at this temperature during storage until the samples were shipped to the laboratory. Sample integrity and custody were maintained throughout the process.

The groundwater samples were packaged and shipped in thermally insulated coolers in accordance with applicable DOT and USACE specifications (EM 200-1-3, Appendix F). Packaging and shipping procedures are listed in Section 9.4 of the FSP (USACE 2006).

During the time period between collection and shipment, all samples were stored firstly at 4-degrees Celsius in ice-filled coolers in a secure area and secondly transferred to a secure USACE refridgerator (for samples only), where they were held at 4-degrees Celsius for several days. Custody seals were placed on the refriderator to maintain integrity prior to shipping. All samples were then packaged in ice-ladened sealed coolers and shipped overnight to the respective laboratories by commercial courier. Chain of custody (COC) seals placed on each cooler before shipment, such that if a sealed cooler is opened, the seal would be broken. The COC seal ensured that no sample tampering occurred between the field collection and laboratory analysis.

This storage and shipping deviation from the FSP process occurred due to laboratory contracting and HTRW-CX interaction (i.e., resolution of desired analytes).

The planning, sampling, and quality assurance methods used for this groundwater sampling program were coincident with other FUSRAP projects and USEPA protocols. All sampling logs, laboratory chain of custody forms, and data validation processes were followed and documented in Appendix A, B. and C. Critical project records such as sample logs, chain-of-custody forms,

laboratory data packages (and electronic data deliverables), and verification/validation results will be maintained in the project file at the Buffalo District to ensure integrity.

7.0 GROUNDWATER SAMPLING RESULTS

The USACE field team was in daily contact with the USACE Project Manager and transmitted Daily Quality Assurance Reports (DQAR) via telephone. Daily activities were summarized and departures from the approved FSP were discussed, none of which adversely affected the data or program quality.

Three deviations from the FSP were encountered during the field mobilization process:

- Well A-20S (or MW-20S) could not be located in the field due to heavy brush, consequently well A-15S (or MW-15S) was sampled instead;
- Well MW-48S could not be opened due to cement on the cap and was not replaced in the program;
- Well MW-31S was dry (13-foot deep well), so adjacent well MW-13D was sampled, which is a ~30-foot deep well.

None of these changes negatively impacted the results or intent of the groundwater sampling program (i.e., areal coverage was not compromised and uncharacteristic results were not obtained).

All samples were labeled and numbered according to FSP guidelines (USACE 2006); each sample was assigned a unique alpha-numeric sample number, sample station location, and matrix code. USACE QA split samples received non-descriptive codes (i.e., for data validation).

The USACE program followed the EPA policy regarding sample custody and chain of custody (COC) protocols as described in *NEIC Policies and Procedures* (EPA 1985). This guided sample collection, laboratory analysis, and final evidence files, which are maintained for the administrative record.

The analytical results from this groundwater sampling effort were delivered to the Buffalo District under hardcopy and electronic format. The lab provided an electronic copy of data (standard electronic data deliverable or SEDD) as a hierarchical text file consisting of the required data elements in XML and PDF formats. The data were validated using in-house staff and analyses performed using Microsoft Excel spreadsheets. The original lab data package is maintained the project manager for later incorporation into datasets from subsequent site investigation programs and/or long-term databases of characterization data, if assembled.

Data validation was performed on all sample data by the USACE chemist per CERCLA guidance (EPA Level 2).

Field parameter data are listed in Table 1. These data show the variability of regional geochemistry and influences from the Joslyn-site organic contamination remedial measure. Several wells show elevated temperature, conductance, and pH that was caused by the geochemical changes caused by the electro-catalytic heating of the groundwater. These slight variations from normal site data slightly influence the uranium results, as discussed below.

Background data are listed in Table 2 with descriptive statistics indicating ranges of expected mean values (confidence limits). The data indicate that the Joslyn area contains minor amounts of natural

uranium in groundwater flowing in the regional glacial sediments. Background or upgradient groundwater sampling results (unfiltered and field filtered) are summarized below in pCi/L (results with QA flags of "U" were included and only affect the U-235 results):

- Uranium-234
  - Unfiltered Data range = 0.12 to 1.16
  - Filtered Data range = 0.17 to 1.27
  - Unfiltered Arithmetic Average = 0.37 and Geometric Average = 0.24
  - Filtered Arithmetic Average = 0.44 and Geometric Average = 0.32
  - Unfiltered 95% Confidence Limits = 0 (0.02) to 0.76
  - Filtered 95% Confidence Limits = 0.03 to 0.85
- Uranium-235 (all results "U" flagged)
  - Unfiltered Data range = -0.003 to 0.038
  - Filtered Data range = 0.01 to 0.08
  - Unfiltered Arithmetic Average = 0.01 (Geometric Average not calculated)
  - Filtered Arithmetic Average = 0.03 (Geometric Average not calculated)
  - Unfiltered 95% Confidence Limits = 0 to 0.03
  - Filtered 95% Confidence Limits = 0.0 to 0.06
- Uranium-238
  - Unfiltered Data range = 0.08 to 1.38
  - Filtered Data range = 0.13 to 1.29
  - Unfiltered Arithmetic Average = 0.41 and Geometric Average = 0.24
  - Filtered Arithmetic Average = 0.40 and Geometric Average = 0.26
  - Unfiltered 95% Confidence Limits = 0 (-0.06) to 0.89
  - Filtered 95% Confidence Limits = 0 (-0.03) to 0.84
- Total Uranium Mass Equivalent (U-238 values multiplied by 3.0 to yield µg/L)
  - Unfiltered Data range = 0.23 to 4.14
  - Filtered Data range = 0.39 to 3.87
  - Unfiltered Arithmetic Average = 1.24 and Geometric Average = 0.73
  - Filtered Arithmetic Average = 1.21 and Geometric Average = 0.79
  - Unfiltered 95% Confidence Limits = 0 (-0.02) to 2.67
  - Filtered 95% Confidence Limits = 0 (-.10) to 2.52

A comparison of filtered to unfiltered U-239 results indicate that approximately 88% of uranium is soluble at 0.45 microns (field filter size).

The site data are listed in Table 3 with descriptive statistics indicating ranges of expected mean values (confidence limits). On-site area-of-concern and downgradient groundwater sampling results (unfiltered and field filtered) in pCi/L are summarized below (results with QA flags of "U" were included and mainly affect U-235 results):

- Uranium-234
  - Unfiltered Data range = -0.01 to 2.19
  - Filtered Data range = 0.0 to 2.52
  - Unfiltered Arithmetic Average = 0.64 (Geometric Average not calculated)
  - Filtered Arithmetic Average = 0.64 and Geometric Average = 0.37
  - Unfiltered 95% Confidence Limits = 0.39 to 0.89
  - Filtered 95% Confidence Limits = 0.36 to 0.91
- Uranium-235
  - Unfiltered Data range = 0.0 to 0.08
  - Filtered Data range = -0.01 to 0.16
  - Unfiltered Arithmetic Average = 0.03 (Geometric Average not calculated)

    - Filtered Arithmetic Average = 0.03 (Geometric Average not calculated)
    - Unfiltered 95% Confidence Limits = 0.02 to 0.05
    - Filtered 95% Confidence Limits = 0.01 to 0.05
- Uranium-238
    - Unfiltered Data range = 0.0 to 2.06
    - Filtered Data range = 0.0 to 1.78
    - Unfiltered Arithmetic Average = 0.65 (Geometric Average not calculated)
    - Filtered Arithmetic Average = 0.56 and Geometric Average = 0.31
    - Unfiltered 95% Confidence Limits = 0.39 to 0.90
    - Filtered 95% Confidence Limits = 0.33 to 0.79
- Total Uranium Mass Equivalent (U-238 values multiplied by 3.0 to yield µg/L)
    - Unfiltered Data range = -0.01 to 6.18
    - Filtered Data range = 0.0 to 5.34
    - Unfiltered Arithmetic Average = 1.94 (Geometric Average not calculated)
    - Filtered Arithmetic Average = 1.68 (Geometric Average not calculated)
    - Unfiltered 95% Confidence Limits = 1.18 to 2.71
    - Filtered 95% Confidence Limits = 0.98 to 2.38

A comparison of filtered to unfiltered U-238 results indicate that approximately 84% of uranium is soluble at 0.45 microns (field filter size).

The data indicate that the groundwater underlying the Joslyn site is not impacted adversely with isotopic uranium from MED-related activities. The range of data and confidence limits indicate that background and site data are similar populations, thus statistically indistinguishable. Several wells did produce slightly elevated results, which may reflect influences from the organic contamination remedial measure and possibly past site operations that depressed ambient groundwater pH. The wells with the highest uranium results exhibited lower pH, which indicates the uranium mobility (speciation and adsorption) is affected or enhanced locally by past site operations. Ambient groundwater geochemical characteristics should be restored to more neutral (background) values over time and thus uranium should again become less mobile, as evidenced by low values in the other distal wells.

8.0 INVESTIGATION-DERIVED WASTE

Investigation derived waste (IDW) included purged groundwater, equipment rinse water, tubing, and PPE (nitril gloves). All liquid IDW generated from monitoring well purging and equipment rinse was containerized in five-gallon collection buckets and subsequently placed in Indiana-DOT approved and labeled open-top 55-gallon drum equipped with a plastic drum liner and sealed with bung-top lids for bulk sampling and temporary storage. The USACE negotiated storage needs with the site owner until the IDW was characterized and disposed.

Solid IDW was bagged and disposed with site-owner waste after surveying was negative.

IDW was minimized using low-flow sampling techniques, limiting access to restricted areas, reuse and decontamination of equipment, and use of non-hazardous materials.

All IDW containers and drums were labeled immediately before and continuously during their use to ensure proper management of the contained wastes. Labeling techniques followed those outlined in Section 13 of the FSP (USACE 2006).

The site owner designated a location for a temporary Field Staging Area (FSA) for the SI IDW. The single FSA was located on an elevated loading dock previously used by the site owner as an IDW staging area during organic contamination remediation tasks. The IDW was stored until characterized according to the FSP (see Section 13 and Table 4 of FSP for procedure and analytes), after which it was disposed by Earth Tech in accordance with the appropriate CERCLA technical requirements and Indiana State guidelines (Indiana regulatory criteria, RCRA, 10 CFR 20, Toxic Substances Control Act [TSCA], Clean Water Act, and Safe Drinking Water Act [SDWA]).

9.0 PATH FORWARD

The groundwater sampling at the Joslyn Site will support the SI and future investigations, if required. The sampling and subsequent data analyses are considered definitive since all on-site wells have been used by the site owner for a voluntary action program fully accepted by the IDEM. Low-flow sampling techniques were used to ensure sample quality and unfiltered sample results will be compared to filtered sample results to ensure sampling artifacts (e.g., turbidity) were eliminated.

The final results indicate that isotopic uranium has not contaminated site groundwater above screening levels and thus may dismiss the groundwater as an exposure pathway at the Joslyn site, pending SI evaluations.

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Table 1. Joslyn Site Groundwater Field Parameters

Well ID	Collect Date	Collect Time	Sampler	Temperature (C)	Specific Conductance (uS/cm)	pH (std. unit)	ORP (mV)	Corrected Eh (mV) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Purge Rate (mL/min)	Comments #
A-18S	27-Jul-06	1045	JMR/WTF	67.60	3002.00	5.76	98	297	0.22	6.3	92	AOC Well
A-24S	27-Jul-06	1050	MG	73.00	886.20	5.29	274	473	0.25	13.0	46	AOC Well
A-27S	26-Jul-06	1440	JMR	73.20	721.50	6.72	171	370	0.23	4.8	82	AOC Well
MW-15S	29-Jul-06	1135	JMR	84.10	1599.00	5.89	3	202	0.18	21.0	92	AOC Well
MW-16S	26-Jul-06	1115	MG	70.70	1019.00	5.91	-19	180	0.19	3.7	96	AOC Well
MW-17S	26-Jul-06	1105	JMR	71.50	1017.00	5.74	199	398	0.24	0.9	96	AOC Well
MW-19S	29-Jul-06	1040	JMR	70.50	2188.00	5.85	163	362	0.62	7.9	96	AOC Well
MW-38S	27-Jul-06	1635	JMR	71.60	1080.00	6.95	-97	102	0.21	379.7	96	AOC Well
A-21S	29-Jul-06	1100	WTF/MG	75.30	1834.00	6.31	200	399	0.21	77.0	90	Downgradient of AOC
A-22S	28-Jul-06	1540	MG	69.40	3142.00	6.10	19	218	0.36	21.0	68	Downgradient of AOC
A-23S	28-Jul-06	1530	JMR	74.60	3620.00	6.19	86	285	0.22	158.6	92	Downgradient of AOC
MW-30S	31-Jul-06	1200	WTF	82.60	1634.00	6.80	-86	113	0.16	10.8	96	Downgradient of AOC
MW-31D	31-Jul-06	1125	MG/WTF	82.80	901.10	6.83	-132	67	0.13	7.5	92	Downgradient of AOC
MW-32S	29-Jul-06	1435	JMR	78.20	735.70	6.75	163	362	0.38	11	92	Downgradient of AOC
MW-49S	29-Jul-06	1430	MG	74.20	877.50	6.54	5	204	0.38	15.2	50	Downgradient of AOC
NEW WELL #1	25-Jul-06	1625	MG	91.20	3609.00	6.19	-165	34	0.16	25.0	88	In remedial design area - AOC
NEW WELL #2	25-Jul-06	1615	WTF/JMR	109.50	4130.00	10.69	32	231	2.29	29.8	88	In remedial design area - AOC
MW-36S	28-Jul-06	1120	MG	64.10	1072.00	7.08	-118	81	0.17	10.0	86	Site Background
MW-45S	30-Jul-06	1215	WTF	70.20	1128.00	7.20	-98	101	0.16	7.5	78	Site Background
MW-39S	27-Jul-06	1625	MG	66.70	1283.00	6.91	-91	108	0.17	126.0	70	Crossgradient of AOC/Background
MW-34S	28-Jul-06	1110	JMR	76.90	651.60	6.94	218	417	1.13	42.9	84	Upgradient of AOC/Background

Data Values:	21	21	21	21	21	21	21	21
Maximum:	109.5	4130	10.69	274	473	2.29	379.70	96
Minimum:	64.1	652	5.29	-165	34	0.13	0.90	46
Arithmetic Mean:	76.1	1721	6.60	39	238	0.38	46.65	84
Geometric Mean:	75.5	1444	6.53	--	194.06	0.27	17.18	83
Standard Deviation:	10.0	1106	1.08	135	135	0.49	86.79	14
95% UCL: @	80.38	2193.36	7.06	97.00	296.00	0.59	83.77	90.49
95% LCL: @	71.8	1247.7	6.1	-18.4	180.6	0.2	9.5	78.1

NOTES:

*** ORP Correction on AgCl calibration with Platinum Electrode; Corrected eH is OPR Value + 199 mV for a "Normal Hydrogen Electrode" Equivalent.**

 # AOC Indicates Radiologic Area Of Concern.

@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, Respectively.

Table 2. Joslyn Site Background Isotopic Uranium Results From Groundwater

Well ID #	Sample Date	Uranium 233/234	Uranium 235/236	Uranium 238	Units
MW-34S	28-Jul-06	1.16 +/- 0.26	0.038 +/- 0.042 U	1.38 +/- 0.29	pCi/L
MW-34S-F	28-Jul-06	1.27 +/- 0.29	0.081 +/- 0.067 J	1.29 +/- 0.29	pCi/L
MW-36S	28-Jul-06	0.118 +/- 0.07	-0.003 +/- 0.025 U	0.075 +/- 0.056 J	pCi/L
MW-36S-F	28-Jul-06	0.174 +/- 0.088	0.011 +/- 0.031 U	0.129 +/- 0.073	pCi/L
MW-39S	27-Jul-06	0.211 +/- 0.097	0.024 +/- 0.042 U	0.211 +/- 0.096	pCi/L
MW-39S-F	27-Jul-06	0.29 +/- 0.11	0.029 +/- 0.038 U	0.167 +/- 0.08	pCi/L
MW-45S	30-Jul-06	0.147 +/- 0.074	0.002 +/- 0.025 U	0.206 +/- 0.085	pCi/L
MW-45S-D	30-Jul-06	0.194 +/- 0.089	0.011 +/- 0.031 U	0.194 +/- 0.089	pCi/L
MW-45S-F	30-Jul-06	0.205 +/- 0.096	0.009 +/- 0.026 U	0.23 +/- 0.1	pCi/L
MW-45S-F-D	30-Jul-06	0.27 +/- 0.11	0.011 +/- 0.032 U	0.195 +/- 0.094	pCi/L

Data Values:	10	10	10
Maximum:	1.27	0.08	1.38
Minimum:	0.12	0.00	0.08
Arithmetic Mean:	0.40	0.02	0.41
Geometric Mean:	0.28	--	0.25
Standard Deviation:	0.43	0.02	0.49
95% UCL: @	0.67	0.04	0.71
95% LCL: @	0.14	0.01	0.10

NOTES:

 # "F" Designates Field Filetered Sample; "D" Designates Field Duplicate Sample.

@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, Respectively.

Table 3. Joslyn Site On-Site and Downgradient Isotopic Uranium Results From Groundwater

Well ID	Sample Date	Uranium 233/234	Uranium 235/236	Uranium 238	Units
A-18S	27-Jul-06	0.99 +/- 0.26	0.02 +/- 0.043 U	1.21 +/- 0.3	pCi/L
A-18S-F	27-Jul-06	1.22 +/- 0.3	0.03 +/- 0.053 U	1.1 +/- 0.28	pCi/L
A-21S	29-Jul-06	1.02 +/- 0.26	0.077 +/- 0.068 J	0.98 +/- 0.25	pCi/L
A-21S-F	29-Jul-06	0.96 +/- 0.24	0.112 +/- 0.08	0.87 +/- 0.23	pCi/L
A-22S	28-Jul-06	0.95 +/- 0.24	0.05 +/- 0.056 U	0.96 +/- 0.24	pCi/L
A-22S-F	28-Jul-06	1.1 +/- 0.28	0.04 +/- 0.053 U	0.88 +/- 0.24	pCi/L
A-23S	28-Jul-06	1.21 +/- 0.29	0.053 +/- 0.06 U	1.35 +/- 0.32	pCi/L
A-23S-F	28-Jul-06	1.23 +/- 0.28	0.031 +/- 0.042 U	1.18 +/- 0.27	pCi/L
A-24S	27-Jul-06	0.5 +/- 0.21	0 +/- 0 U	0.39 +/- 0.18	pCi/L
A-24S-F	27-Jul-06	0.18 +/- 0.088	-0.006 +/- 0.028 U	0.209 +/- 0.094	pCi/L
A-27S	26-Jul-06	1.01 +/- 0.25	0.081 +/- 0.066 J	0.94 +/- 0.24	pCi/L
A-27S-F	26-Jul-06	0.87 +/- 0.21	0.039 +/- 0.053 U	0.76 +/- 0.19	pCi/L
DUP01 (A-27S)	26-Jul-06	0.84 +/- 0.21	0.074 +/- 0.061 J	0.95 +/- 0.22	pCi/L
DUP01-F (A-27S)	26-Jul-06	0.8 +/- 0.2	0.016 +/- 0.033 U	0.72 +/- 0.19	pCi/L
MW-15S	30-Jul-06	0.015 +/- 0.031 U	0 +/- 0 U	0.015 +/- 0.031 U	pCi/L
MW-15S-F	30-Jul-06	0.072 +/- 0.06 J	-0.003 +/- 0.028 U	0.025 +/- 0.037 U	pCi/L
MW-16S	26-Jul-06	-0.005 +/- 0.024 U	0.009 +/- 0.028 U	-0.002 +/- 0.03 U	pCi/L
MW-16S-F	26-Jul-06	0.018 +/- 0.043 U	-0.003 +/- 0.033 U	0.035 +/- 0.043 U	pCi/L
MW-17S	26-Jul-06	0.31 +/- 0.11	0.018 +/- 0.031 U	0.31 +/- 0.1	pCi/L
MW-17S-F	26-Jul-06	0.187 +/- 0.091	-0.006 +/- 0.028 U	0.29 +/- 0.11	pCi/L
MW-19S	29-Jul-06	1.12 +/- 0.28	0.081 +/- 0.073 J	1.4 +/- 0.33	pCi/L
MW-19S-F	29-Jul-06	1.11 +/- 0.27	0.084 +/- 0.068 J	1.14 +/- 0.27	pCi/L
MW-30S	31-Jul-06	0.56 +/- 0.16	0.011 +/- 0.037 U	0.36 +/- 0.13	pCi/L
MW-30S-F	31-Jul-06	0.45 +/- 0.14	0.008 +/- 0.024 U	0.33 +/- 0.12	pCi/L
MW-31D	31-Jul-06	0.03 +/- 0.044 U	-0.003 +/- 0.027 U	0.017 +/- 0.041 U	pCi/L
MW-31D-F	31-Jul-06	0 +/- 0 U	-0.009 +/- 0.032 U	0.017 +/- 0.029 U	pCi/L
MW-32S	29-Jul-06	0.68 +/- 0.18	0.074 +/- 0.061 J	0.67 +/- 0.18	pCi/L
MW-32S-F	29-Jul-06	0.54 +/- 0.16	0.024 +/- 0.042 U	0.73 +/- 0.19	pCi/L
MW-38S	27-Jul-06	0.059 +/- 0.056 U	0 +/- 0 U	0.077 +/- 0.057 J	pCi/L
MW-38S-F	27-Jul-06	0.097 +/- 0.07 J	0.003 +/- 0.031 U	0.081 +/- 0.058 J	pCi/L
MW-49S	29-Jul-06	0.108 +/- 0.064	0.008 +/- 0.024 U	0.199 +/- 0.089	pCi/L
MW-49S-F	29-Jul-06	0.202 +/- 0.088	0.01 +/- 0.028 U	0.15 +/- 0.073	pCi/L
NEW WELL #1	25-Jul-06	2.19 +/- 0.42	0.066 +/- 0.059 J	2.06 +/- 0.4	pCi/L
NEW WELL #1-F	25-Jul-06	2.52 +/- 0.47	0.157 +/- 0.089	1.78 +/- 0.36	pCi/L
NEW WELL #2	25-Jul-06	0.021 +/- 0.028 U	-0.002 +/- 0.021 U	0.006 +/- 0.017 U	pCi/L
NEW WELL #2-F	25-Jul-06	0.038 +/- 0.04 U	0.008 +/- 0.024 U	0 +/- 0 U	pCi/L

Maximum:	2.52	0.16	2.06
Minimum:	-0.01	-0.01	0.00
Arithmetic Mean:	0.67	0.03	0.63
Geometric Mean:	--	--	--
Standard Deviation:	0.60	0.04	0.54
95% UCL: @	0.87	0.04	0.80
95% LCL: @	0.48	0.02	0.46

NOTES:
 # "F" Designates Field Filetered Sample; "D" Designates Field Duplicate Sample (Except for MW-31D).
@ UCL and LCL Indicates Lower Confidence Limit and Upper Confidence Limit, Respectively.

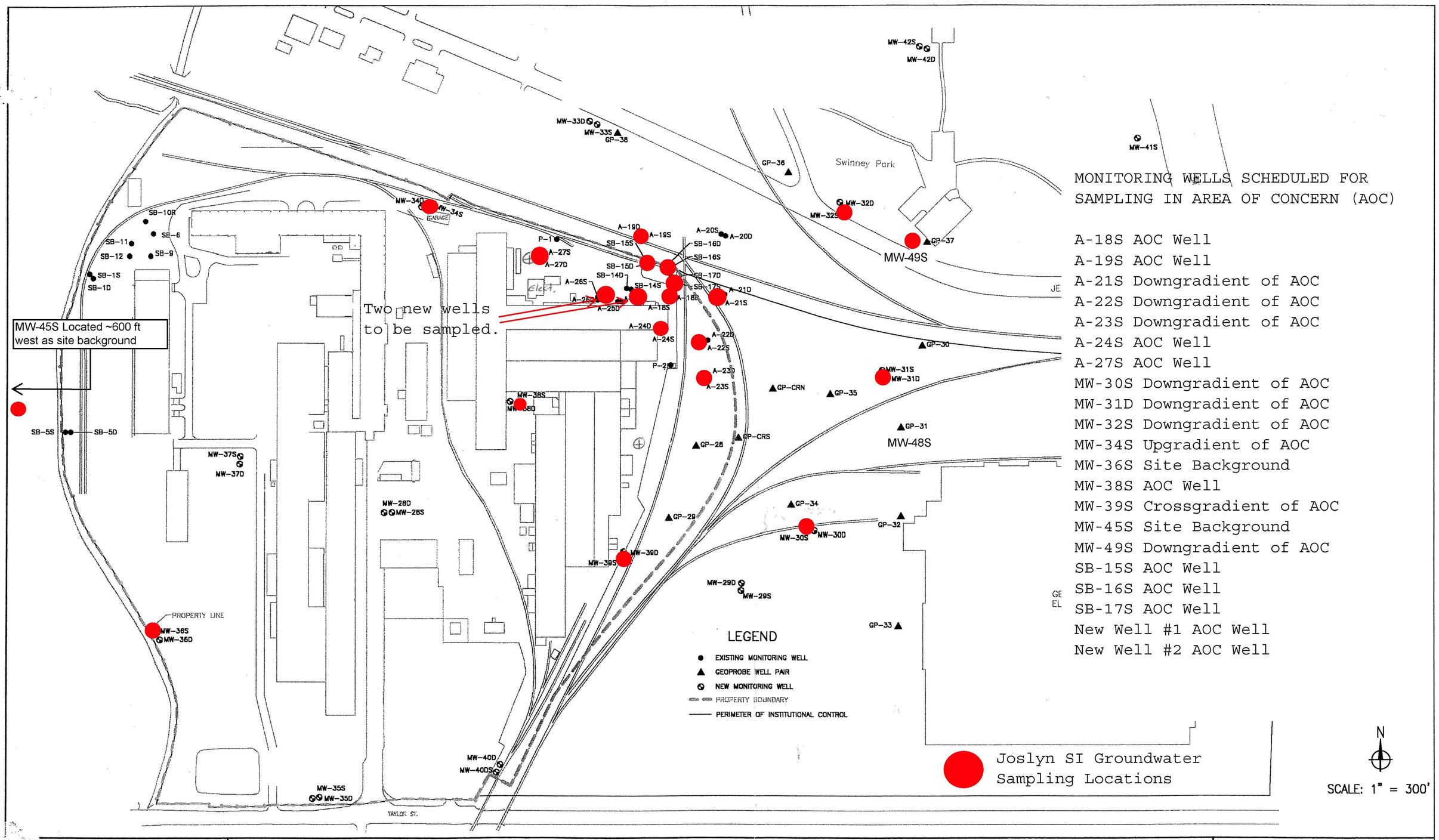

Figure 1. Joslyn SI Groundwater Sampling Locations

U.S. Army Corps of Engineers
Buffalo District
Joslyn Steel FUSRAP

APPENDIX A

Completed Sample Log Forms

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/25/06	WELL ID: New Well #I (West)
a. WELL DEPTH (From top of riser casing in ft): 34.8	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 10.85 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
1535	10.90	88		94.2	3723	6.23	-178	0.63	10
1540	10.89	86		93.7	3703	6.21	-193	0.30	15
1545	10.89	88		93.4	3699	6.20	-197	0.21	20
1550	10.89	90		93.1	3686	6.21	-196	0.15	55
1555	10.89	84		92.7	3672	6.21	-192	0.14	45
1600	10.89	86		91.7	3657	6.20	-180	0.15	45
1605	10.89	88		92.0	3643	6.19	-176	0.14	35
1610	10.89	88		91.1	3626	6.18	-171	0.13	36
1615	10.89	88		91.0	3613	6.19	-164	0.15	26
1620	10.89	88		91.2	3609	6.19	-165	0.16	25
1625	Start sample collection								
1648	complete sample collection								

APPEARANCE/COLOR	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-28-06	WELL ID: A-235
a. WELL DEPTH (From top of riser casing in ft): 23	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 14.30 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1425 [redacted] ~~1415~~	14.30	92.0		74.6	3743	6.29	65	0.41	65.1
1430	14.30	92		75.4	3728	6.23	66	.32	69.3
1435	14.30	92		75.3	3721	6.23	70	.29	121.3
1440	14.30	92		74.0	3719	6.25	71	.27	129.1
1445	14.29	96		74.9	3684	6.21	64	.26	168.5
1450	14.29	92		75.1	3697	6.22	56	.25	185.6
1455	14.30	92		75.5	3694	6.21	51	.25	233.8
1500	14.30	92		75.2	3691	6.22	45	.24	420.0
1505	14.30	96		75.7	3663	6.20	74	.25	601.0
1510	14.30	96		74.7	3653	6.19	83	.24	526
1520	14.30	96		74.9	3655	6.17	80	.23	722.6
1525	14.30	92		74.6	3620	6.19	86	.22	158.6
1530	Started Sample								

APPEARANCE/COLOR Colorless	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATU[redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: ~~7-27-06~~ 7-28-06	WELL ID: 3 MW-34S
a. WELL DEPTH (From top of riser casing in ft): 20' bgs	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 10.93' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 9.07'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
0930	10.93	100		74.7	882.6	6.92	244	2.08	15.1 ~~3066~~
0935	10.92	88		74.0	831.0	6.92	250	1.80	226.3
0940	11.2	88		73.6	801.0	6.91	239	1.60	11.6
0945	11.2	88		74.0	770.0	6.91	236	1.67	38.2
0950	11.2	88		74.4	739.5	6.88	232	1.75	168.4
0955	11.28	88		74.4	719.8	6.90	230	1.98	21.1
1000	11.27	88		74.9	713.3	6.89	229	2.14	39.6
1005	11.27	96		75.4	716.6	6.91	225	2.14	59.3
1010	11.27	88		75.5	705.4	6.90	224	2.09	15.9
1015	11.3	88		75.8	698.8	6.90	225	2.04	41.7
1020		92		76.4	692.2	6.91	220	1.94	73.2
1025	11.27	92		76.6	679.6	6.91	221	1.81	12.1
1035		92		77.2	669.8	6.94	217	1.64	43.1
1040		82		77.3	666.7	6.96	206	1.30	138.8
1045		88		76.9	654.5	6.96	219	1.23	21.9
1050		88		76.7	655.2	6.94	224	1.19	29.4
1100		84		77.2	654.4	6.95	222	1.16	14.1
1105		84		76.9	651.6	6.94	218	1.13	42.9
1110	Started sampling								

APPEARANCE/COLOR	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/28/06	WELL ID: MW-~~345~~ 36S
a. WELL DEPTH (From top of riser casing in ft): 23'	INNER CASING/OPEN HOLE DIAMETER (inches): 2
b. WATER LEVEL (Top of riser casing in ft): 14.74' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 8.26'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1010	14.77	86	~~14.77~~ [redacted]	65.5	1106	6.97	-138	2.66	42.7
1015	14.77	86	~~14.77~~ [redacted]	64.9	1098	7.05	-141	0.43	36.1
1025	14.78	84	~~14.78~~ [redacted]	65.1	1091	7.09	-136	0.34	31.0
1030	14.78	86		65.0	1086	7.10	-132	0.24	25.4
1035	14.78	84		65.1	1085	7.11	-129	0.25	22.0
1040	14.78	86		65.6	1082	7.11	-128	0.25	22.0
1045	14.78	88		65.1	1083	7.11	-126	0.19	21.0
1050	14.78	86		64.6	1078	7.12	-123	0.21	14.0
1055	14.79	90		64.5	1078	7.09	-122	0.19	14.0
1100	14.79	88		64.6	1078	7.11	-121	0.20	12
1105	14.79	90		64.6	1075	7.10	-119	0.19	13
1110	14.79	90		64.4	1072	7.10	-118	0.16	11
1115	14.80	86		64.1	1072	7.08	-118	0.17	10
1120	~sample collection,			1.0 L	filtered	and unfiltered	for	Iso	-U

APPEARANCE/COLOR Clear	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-28-06	WELL ID: A-225
a. WELL DEPTH (From top of riser casing in ft): 22	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 14.08 / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
1435	14.10	60		72.7	3054	6.13	78	0.95	70
1440	14.10	62		70.6	3080	6.08	76	0.61	50
1445	14.10	62		69.7	3105	6.11	70	0.46	45
1450	14.10	64		69.0	3136	6.11	62	0.38	40
1455	14.10	72		69.0	3143	6.11	58	0.35	36
1500	14.10	66		69.4	3146	6.11	53	0.33	33
1505	14.10	64		69.9	3150	6.12	44	0.36	32
1510	14.10	64		69.7	3149	6.12	40	0.34	31
1515	14.10	68		69.5	3137	6.11	37	0.35	28
1520	14.10	68		69.0	3123	6.13	29	0.39	28
1525	14.10	69		68.2	3144	6.12	21	0.35	25
1530	14.10	68		68.8	3141	6.09	21	0.40	21
1535	14.10	68		69.4	3142	6.10	19	0.36	21
1540	- start sample collection, collected QA #1								
1625	- complete sample collection								

APPEARANCE/COLOR clear	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-29-06	WELL ID: MW-19S
a. WELL DEPTH (From top of riser casing in ft): 29.00 [redacted]	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 18.81 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 10.19	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
0935	~~70.8~~ 18.80	108		68.6	2361	5.63	207	.70	15
0940	18.86	88		68.6	2363	5.84	197	.57	14
0945	18.85	96		68.8	2347	5.87	192	.56	11
0955	18.85	96		68.7	2283	5.89	184	.46	11
1000	Train	96		68.7	2246	6.09	182	.49	10
1005	18.85	96		69.0	2203	5.87	178	.51	9.9
1010	18.85	88		69.3	2179	5.84	175	.56	10
1015	18.85	92		69.2	2171	5.90	173	.59	10
1020	Train	92		69.1	2172	5.92	171	.58	9.1
1025	Train	92		69.4	2174	5.82	169	.59	8.4
1030	18.85	92		69.3	2179	5.85	166	.58	8.1
1035	18.85	96		70.5	2188	5.85	163	.62	7.9
1040	Samples taken Unfilt. & Filtered, 1.0L each								

APPEARANCE/COLOR Clear to very pale yellow	PID/FID (Odor)
SAMPLE BY (pri [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-29-06	WELL ID: ~~A-195~~ A-215
a. WELL DEPTH (From top of riser casing in ft): 37.7	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 14.17 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP Eh (mv)	DO (mg/L)	Turbidity (NTU)
0950	14.17	84.0		76.8	1819	6.24	219	0.92	11.7
1000	14.19	70.0		72.3	1891	6.09	223	0.53	26.6
1010	14.19	82.0		70.6	1950	6.15	213	0.45	192.0
1020	14.19	96.0		71.2	1930	6.18	208	0.31	97.0
1030	14.19	90.0		72.6	1931	6.30	200	0.30	35.4
1040	14.19	92.0		74.0	1862	6.32	197	0.00	28.0
1050	14.19	90		75.2	1822	6.32	196	0.20	19.1
1055	14.19	90.0		75.3	1834	6.31	200	0.21	77.0
1100	Start sample collection								
1124	Complete Collection, Filt. & Unfilt. 7 OL each								

APPEARANCE/COLOR Clear	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-24-06	WELL ID: MW-32S
a. WELL DEPTH (From top of riser casing in ft): ~~30.5~~ 20.0 bg	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): ~~10.45~~ → 11.2' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 8.80	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1330	11.20	110.0		75.6	714.6	6.74	144	1.43	45.0
1350	11.20	110.0		75.3	708.6	6.74	137	.34	29
1355	11.20	104.0		76.2	710.0	6.74	139	.37	25
1400	11.2	88		77.2	716.0	6.77	144	.37	19
1405	11.2	92		77.7	724	6.75	148	.34	18
1410	11.2	96		78.2	727.1	6.75	152	0.34	15.0
1415	11.2	88.0		78.2	730.8	6.75	155	0.35	14.0
1425	11.2	92.0		78.7	733.9	6.76	159	0.34	11.0
1430	11.2	92.0		78.2	735.7	6.75	163	.38	11.0
1435	Sample filtered & unfiltered								

APPEARANCE/COLOR Slight yellow color	PID/FID (Odor)
SAMPLE BY (pri[redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY [redacted] No Lock	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-29-06	WELL ID: mw-495
a. WELL DEPTH (From top of riser casing in ft): 17.5	INNER CASING/OPEN HOLE DIAMETER (inches): 2'
b. WATER LEVEL (Top of riser casing in ft): 14.97' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 2.53'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1325	15.05	60		78.5	880.2	6.46	-6	0.34	841.0
1330	15.05	60		74.2	836.9	6.36	9	0.47	448.0
1335	15.05	56		75.6	834.4	6.36	9	0.46	302.7
1340	15.05	54		75.9	829.4	6.34	13	0.50	331.2
1345	15.05	60		75.6	838.1	6.49	7	0.51	73.0
1350	15.04	58		75.4	854.9	6.52	4	0.44	63.2
1355	15.04	56		75.7	854.4	6.52	10	0.42	78.5
1400	15.04	52		75.4	854.0	6.53	4	0.39	109.1
1405	15.04	52		73.9	859.0	6.52	1	0.38	22.0
1410	15.04	52		75.3	857.2	6.52	3	0.36	16.9
1415	15.04	50		74.9	859.1	6.54	9	0.36	13.1
1420	15.04	50		74.8	862.3	6.50	[redacted] ~~6~~ 12	0.35	10.1
1425	15.04	50		74.0	886.7	6.54	8	0.43	13.6
1430	15.04	50		74.2	877.5	6.54	5	0.38	15.2
1430 - start sample collection									
1500 - complete sample collection									

APPEARANCE/COLOR clear	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

14.6
21.8

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-30-06	WELL ID: MW-155
a. WELL DEPTH (From top of riser casing in ft):	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 14.6 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (~~m~~S/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1030	14.6	100		82.5	1583	6.07	-5	.32	38.5
1035	14.6	96		82.4	1585	6.05	-4	.29	9.2
1040	14.6	92		83.5	1599	6.01	-17	.26	36.3
1045	14.6	88		83.1	1596	6.00	-25	.25	23.5
1050	14.6	88		83.7	1603	5.98	-43	.22	4.2
1100	14.6	92		85.2	1613	5.96	-68	.21	9.9
1105	14.6	92		85.7	1604	5.96	-17	.22	.5
1110	14.6	84		88.0	1602	5.96	3	.21	8.7
1115	14.6	116		87.1	1589	5.93	36	.18	37.4
1120	14.7	100		83.5	1574	5.93	45	.16	46
1125	14.7	100		84.2	1595	5.90	0	.17	46
1130	14.7	92		84.1	1599	5.89	3	.18	21
1135	Started sampling filter + unfilter								

APPEARANCE/COLOR Clear	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-30-06	WELL ID: MW-45S
a. WELL DEPTH (From top of riser casing in ft): 11.84'	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 3.98 / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 7.86'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1115		132.0 ~~120~~		67.6	1150	6.94	-111	1.91	15.0
1130	5.11'	100.0		73.6	1123	7.19	-113	0.45	11.0
1140		80.0		71.0	1120	7.20	-109	0.24	9.2
1150	5.85	78.0		70.9	1130	7.20	-105	0.20	8.1
1200	5.99	76.0		69.9	1126	7.20	-101	0.20	7.4
1210	6.04	78.0		70.2	1128	7.20	-98	0.16	7.5
1215	Start Sampling, Unf. & Filtered, 1.0 L each								
	- Field Duplicate taken, Unf & Filt, 1.0 L each								
	6.30'								

APPEARANCE/COLOR	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-31-06	WELL ID: MW-31D
a. WELL DEPTH (From top of riser casing in ft): 18.00	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 13.41 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 5.2	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP Eh (mv)	DO (mg/L)	Turbidity (NTU)
1005	13.41	92.0		73.3	882.1	6.73	-123	0.37	clear
1015	13.41	96.0		76.3	886.9	6.77	-122	0.31	clear
1030	13.42	92.0		79.5	895.1	6.79	-126	0.17	clear
1040	13.42			79.9	894.0	6.79	-127	0.15	clear
1050	13.42	104.0		80.3	896.6	6.80	-129	0.16	clear
1100	13.42	96.0		81.7	899.5	6.82	-130	0.15	clear
1110	13.42	92.0		82.4	899.1	6.81	-131	0.14	clear
1120	13.42	92.0		82.8	901.1	6.83	-132	0.13	7.5
1125	start	sample	collection						
1120	complete	sample	collection						
* Sampled MW-31D since 31S was dry at 13.8'									

APPEARANCE/COLOR clear, sheen on water surface, iron precipitate formed in purge bucket	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/31/06	WELL ID: MW-30S
a. WELL DEPTH (From top of riser casing in ft): 20.30	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 11.45 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 8.85	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
1030	11.46	104		77.0	1633	6.72	-50	0.30	26.7
1035	11.46	104		79.5	1637	6.71	-63	0.28	35.5
1045	11.46	100		79.5	1677	6.76	-71	0.25	43.6
1055	11.47	104		81.1	1670	6.78	-68	0.21	1.30
1105	11.47	92.0		82.0	1668	6.76	-70	0.20	1.10
1115	11.47	100.0		81.0	1644	6.88	-71	0.19	25.4
1125	11.47	100.0		82.0	1626	6.80	-102	0.18	3.0
1145	11.47	96.0		82.6	1633	6.77	-101	0.16	3.2
1150	11.47	96.0		82.9	1633	6.81	-73	0.17	0.5
1155	11.47	96.0		82.6	1634	6.80	-86	0.16	10.8
1200 * Begin sampling, Unf. & Filt., Isol, 1.0L each									
1215	Completed								

APPEARANCE/COLOR: Clear, Fe oxides in bucket	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AN [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/25/06	WELL ID: New Well #2 (East)
a. WELL DEPTH (From top of riser casing in ft): 30.0 bg	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 11.16' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 18.84'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft): Unknown
- Middle of screen measured from top of riser casing (ft): Unknown
- Bottom of the screen measured from top of riser casing (ft): 30.0

Teflon line to 25' bg

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
1500	11.40			106.0	4261	10.94	63	1.30	29.9
1515	12.70	84.0		109.8	4219	10.84	16	1.14	91.1
1520				109.3	4230	10.84	3	1.34	91.1
1525	14.30	92.0		111.8	4204	10.79	-6	1.43	45.6
1535	15.22	92.0		111.3	4188	10.79	-10	1.53	3.6
1545	16.5	96.0		112.0	4160	10.73	6	1.72	65.8
1550	16.77	96.0		112.0	4146	10.71	12	1.83	86.3
1555	17.40	84.0		111.9	4140	10.72	16	1.92	52.8
1600	18.05	92.0		110.0	4159	10.69	31	2.02	21.1
1605	18.6	88.0		111.8	4113	10.67	17	1.89	11.2
1615	19.66	88.0	2.0g	109.5	4130	10.69	32	2.29	29.8
Sampler Taken - Unfiltered & Filtered - 1630 completed									

APPEARANCE/COLOR: Clear to Slight Yellow hint	PID/FID (Odor): —
SAMPLE BY (print): [redacted]	SAMPLED BY (print):
SIGNATURE: [redacted]	SIGNATURE:
WELL CAP REPLACED AND LOCKED BY: [redacted]	DATE/TIME:

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/26/06	WELL ID: MW-16S
a. WELL DEPTH (From top of riser casing in ft): 19'	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 14.49 / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
1:05	14.49	70		66.6	4100	9.70	-409	0.27	*
1010	14.53	80		67.9	3906	9.59	-433	0.19	*
1015	14.53	78		68.5	3207	9.22	-439	0.14	*
1020	14.50	80		69.3	2481	8.61	-416	0.20	*
1021 - stop pumping, drained flow cell									
1025	14.53	- raised tubing 4 feet, water cleared							
1030	- drained cell again								
1035	14.53	96		66.4	981.2	5.92	-10	0.46	5.8
1040	14.56	96		67.4	978.2	5.90	-13	0.29	5.18
1045	14.56	92		69.5	1002	5.88	-15	0.52	5.46
1050	14.56	92		69.7	1009	5.89	-16	0.34	5.02
1055	14.56	98		70.4	1011	5.89	-16	0.26	4.98
1100	14.56	92		70.6	1013	5.91	-17	0.24	4.86
1105	14.56	92		70.7	1017	5.90	-18	0.24	4.12
1110	14.56	96		70.7	1019	5.91	-19	0.19	3.70
1115 - start sample collection									
1145 - stop sample collection MW-16S + MW-16S-F, 1 Leach									
* water is black, obvious product, petroleum odor, likely off-scale, probably DNAPL									

APPEARANCE/COLOR water is black/opaque Clear after raising tubing	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/26/06	WELL ID: MW-175
a. WELL DEPTH (From top of riser casing in ft): 25' bg	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 14.37' With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 10.63'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
1010	14.37	84		75.2	1015	5.85	248	.54	20.8
1020	14.35	96		70.4	1035	5.80	238	.42	11.6
1025	14.34	96		69.3	1039	5.84	233	.31	50.3
1030	14.34	92		70.0	1032	5.84	231	.29	13.6
1035	14.34	88		70.0	1013	5.83	232	.28	1.0
1040	14.34	92		70.3	1020	5.80	229	.27	16.3
1045	14.34	92		70.9	1006	5.77	224	.26	3.6
1050	14.34	92		71.0	1007	5.76	210	.25	7.2
1055	14.34	96		71.1	1006	5.77	202	.24	3.0
1100	14.34	96		71.3	1015	5.76	200	.24	2.3
1105	14.37			71.5	1017	5.74	199	.24	.9
*1145	Sampling Complete MW-175 and MW-175-F, 1.0L each								

APPEARANCE/COLOR Slight Brown Color	PID/FID (Odor)
SAMPLE BY (p[redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-26-06	WELL ID: A-27S
a. WELL DEPTH (From top of riser casing in ft): 16'	INNER CASING/OPEN HOLE DIAMETER (inches): 2"
b. WATER LEVEL (Top of riser casing in ft): 9.65' With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 4.35'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
1340	9.64	90		77.5	639.0	6.54	203	.65	3.0
1345	9.65	94		75.1	661.9	6.58	203	.53	10.6
1350	9.65	88		74.8	680.4	6.64	203	.48	60.7
1355	9.66	84		74.4	701.6	6.66	204	.38	28.5
1400	9.66	90		74.9	702.5	6.70	204	.31	3.2
1410	9.65	98		75.3	710.3	6.73	198	.25	6.4
1415	9.66	86		75.4	715.2	6.74	185	.24	1.3
1420	9.66	96		74.9	717.8	6.74	178	.23	65.9
1425	9.66	92		74.3	714.8	6.75	173	.23	14.3
1430	9.65	92		73.7	718.7	6.74	172	.23	20.3
1435	9.65	82		73.2	721.5	6.72	171	.23	4.8
1440	Started		Sample	collection					
	Collected		MS/MSD/DUP-D1 (1535)						
			A-27S-ISC-U						

APPEARANCE/COLOR Slight brown color	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATU[redacted]	SIGNATURE
WELL CAP REPLACED [redacted]	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-27-06	WELL ID: A-185
a. WELL DEPTH (From top of riser casing in ft): 22.4' bg	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 9.79' / With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): 12.7'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	~~Eh~~ ORP (mv)	DO (mg/L)	Turbidity (NTU)
0940 WTF	9.79			71.3	3315	5.88	63.0	0.80	
0950	8.40	100.0		70.5	3311	5.89	65	0.66	9.27
0955	9.85	100.0		66.6	3346	5.88	70	.33	7.75
1005	9.84	92		66.8	3224	5.85	78	.27	8.06
1010	9.84	92		66.7	3184	5.82	81	.26	7.49
1015	9.83	92		67.2	3065	5.78	84	.24	9.18
1020	9.83	92		67.0	3045	5.76	94	.23	8.62
1025	9.84	92		67.1	3020	5.73	97	.23	7.25
1030	9.84	92		66.8	3001	5.72	98	.23	7.75
1035	9.84	92		66.8	3003	5.72	98	.23	6.99
1040	9.84	92		67.6	3002	5.76	98	.22	6.26
1045	Sampling A-185 for Unf & Filtered, 1.0 L, 1110 Complete								

APPEARANCE/COLOR: Clear to yellowish	PID/FID (Odor): NA / None
SAMPLE BY (print): [redacted]	SAMPLED BY (print):
SIGNATURE: [redacted]	SIGNATURE:
WELL CAP REPLACED AND LOCKED BY: [redacted]	DATE/TIME: 7/27/06

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/27/06	WELL ID: A-24 5
a. WELL DEPTH (From top of riser casing in ft): 18.8	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 9.63 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
0940	10.11	70		74.6	744.7	5.15	281	0.45	340.1
0945	10.68	50		73.1	751.2	5.14	283	0.39	18.5
0950	11.10	50		72.5	761.4	5.12	283	0.37	6.0
0955	11.25	50		72.2	764.6	5.14	283	0.35	37.1
1000	11.45	48		72.0	781.1	5.18	282	0.32	108.8
1005	11.67	49		72.0	803.3	5.22	281	0.42	22.4
1010	11.71	44		72.2	789.5	5.19	281	0.30	25.2
1015	11.81	50		72.0	808.8	5.22	278	0.29	58.9
1020	11.81	42		72.2	819.4	5.23	280	0.28	35.9
1025	11.84	44		72.4	825.2	5.24	279	0.26	3.7
1030	11.85	44		72.5	828.2	5.24	276	0.27	27.6
1035	11.82	44		72.6	846.9	5.28	277	0.26	18.8
1040	11.82	50		72.9	855.9	5.29	274	0.25	139.2
1045	11.82	46		73.0	866.2	5.29	274	0.25	13.0
1050 -	Start Sample collection								
1120	Complete Sample collection								

APPEARANCE/COLOR slight rust color, reddish brown precipitate in water	PID/FID (Odor)
SAMPLE BY (print) [redacted]	SAMPLED BY (print)
SIGNATURE [redacted]	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7-27-06	WELL ID: MW-38S
a. WELL DEPTH (From top of riser casing in ft): ~19' bg	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 9.90' b tor — With Pump: –	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a): ~10.1'	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	ORP ~~Eh~~ (mv)	DO (mg/L)	Turbidity (NTU)
1505	9.90	96.0		83.2	1032	6.84	-60	0.60	379.7
1515	9.90	100.0		71.6	1043	6.79	-43	0.89	146.3
1525	9.91	104.0		71.8	1011	6.81	-68	0.30	109.8
1530	9.91	92.0		71.2	1020	6.83	-73	0.25	163.5
1540	9.90	92.0		71.2	1048	6.88	-85	0.24	17.0
1545	9.90	96.0		71.0	1064	6.91	-92	0.26	99.1
1550	9.90	96.0		70.6	1067	6.93	-94	.25	44.8
1555	9.9	96.0		70.5	1072	6.95	-98	.24	222.1
1600	9.9	92.0		70.6	1074	6.95	-99	.23	172.1
1605	9.91	96.0		71.2	1105	6.95	-100	.22	106.9
1610	9.91	96.0		70.8	1073	6.95	-101	.21	37.2
1615	9.91	96.0		71.0	1078	6.95	-102	.21	3.9
1620	9.91	96.0		70.9	1075	6.96	-101	.21	72.6
1625	9.91	96.0		70.9	1078	6.96	-101	.21	379.7
1630	9.91	96.0		71.6	1080	6.95	-97	.21	379.7
1635	Sample Unf. & Filtered, 1.0L each								

APPEARANCE/COLOR: Clear to yellow, slighly cloudy	PID/FID (Odor): NA
SAMPLE BY (print): [redacted]	SAMPLED BY (print):
SIGNATURE: [redacted]	SIGNATURE:
WELL CAP REPLACED AND LOCKED BY: [redacted]	DATE/TIME:

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/27/06	WELL ID: MW-395
a. WELL DEPTH (From top of riser casing in ft): 17.94	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): 10.24 — With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
1425	10.26	70		67.5	1316	6.75	-70	0.93	>999
1430	10.27	74		67.2	1311	6.77	-86	0.35	>999
1435	10.26	70		66.9	1310	6.88	-92	0.18	>999
1440	drain flowcell due to high turbidity								
1445	10.25	54		69.5	1303	7.01	-68	0.99	>999
1450	10.25	76		69.8	1304	6.90	-71	0.88	>999
1453	drained flow cell								
1500	10.25	72		67.0	1296	7.00	-73	1.41	>999
1505	10.25	68		66.9	1293	6.89	-82	0.38	>999
1510	10.25	70		66.6	1292	6.88	-86	0.24	>999
1515	10.25	70		66.5	1292	6.91	-88	0.22	>999
1518	drained and cleaned flow cell								
1525	10.26	70		66.6	1256	6.97	-76	1.44	347
1530	10.26	70		66.5	1283	6.92	-81	0.60	360
1535	10.26	74		66.5	1285	6.90	-84	0.35	390
1537	drained flowcell								0
1545	10.25	74		66.0	1285	7.02	-78	0.77	312
1550	10.26	74		66.2	1285	6.92	-84	0.38	262
1555		74		66.2	1285	6.91	-88	0.22	208
1557	drained flow cell								

APPEARANCE/COLOR	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

1508 - water level rose 0.04' when train went by well from 10.25' to 10.21' bgs

JOSLYN WELL SAMPLING RECORD/FIELD WATER QUALITY SAMPLING AND ANALYSIS

DATE: 7/27/06	WELL ID: MW-39S (cont)
a. WELL DEPTH (From top of riser casing in ft):	INNER CASING/OPEN HOLE DIAMETER (inches):
b. WATER LEVEL (Top of riser casing in ft): With Pump:	WELL VOLUME (s):
c. WATER DEPTH (Feet, subtract b from a):	SAMPLING METHOD: GeoPump 2 Peristaltic Pump, Hydrolab Flowcell

- Top of screen measured from top of riser casing (ft):
- Middle of screen measured from top of riser casing (ft):
- Bottom of the screen measured from top of riser casing (ft):

Sample Time (From/To)	Water Level (ft TOC)	Discharge (mL Per Minute)	Volume Purged (Liter)	Temp °C	Specific Cond. (mS/cm)	pH	Eh (mv)	DO (mg/L)	Turbidity (NTU)
1610	16.27	70		66.9	1270	6.92	-82	0.53	72.9
1615	16.25	70		66.6	1279	6.91	-86	0.28	72
1620	16.25	70		66.6	1281	6.91	-89	0.24	121
1625	16.25	70		66.7	1283	6.91	-91	0.17	126
1627	Sampled Unf. & Filtered, 1.0L each								
1650	complete sample collection								

APPEARANCE/COLOR	PID/FID (Odor)
SAMPLE BY (print)	SAMPLED BY (print)
SIGNATURE	SIGNATURE
WELL CAP REPLACED AND LOCKED BY	DATE/TIME

APPENDIX B

Chain of Custody Forms

LOT# F6H160302

STL ST. LOUIS

COR# 3797

Chain of Custody Record

US Army Corps of Engineers®
Buffalo District

Page 1 of 1

COC No.: Joslyn-01
Date: 15 AUG 2006

Name: USACE - Buffalo District
Address: 1776 Nia[redacted]
Phone Number: (7[redacted]
Project Manager: [redacted] / [redacted] Cabrera
Project Name: Joslyn
Job/Contract/P.O. #:
Sampler (Signature) (Printed Name) [redacted]

Laboratory Name: STL-St Louis
Address: 13715 Rider Trail N.
Phone: [redacted]
Contact: [redacted]

Field Sample #	Container Type	# Jars	Date	Time	Matrix	Metals	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	Hyalella azteca	Chironomus tentans	Lumbriculus variegatus	ISO-U			OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
MW-30S-F	HDPE	1	31JUL06	1200	W							[redacted]			LP			X			
MW-34S		1	28JUL06	1110	W							08/16/06									
DUP01			26JUL06	1535																	
A-18S-F			27JUL06	1045																	
MW-31D-F			31JUL06	1125																	
MW-16S-F			26JUL06	1115																	
A-27S		3	26JUL06	1435									3xLP								MS/MSD for ISO-U
MW-34S-F		1	28JUL06	1110										LP							
~~A-27S~~ A-27S-F		3	26JUL06	1435									3xLP								MS/MSD for ISO-U
MW-30S		1	31JUL06	1200										LP							
MW-31D		1	31JUL06	1125																	
MW-38S-F		1	27JUL06	1635																	

Subtotal Number of Containers:

Preservatives for above requested parameters:
A. Nitric Acid
B.
C.
D.

Methods for above requested parameters:
ISO-U (alpha Spec)

Relinquished by	Date	Received by	Date
[redacted]	15 AUG 2006	[redacted]	08.16.06
Time	1600	Time	0900
USACE (Company)		STL St. Louis (Company)	
Relinquished by	Date	Received by	Date
Signature		Signature	
Printed Name	Time	Printed Name	Time
Company		Company	

Shipment Method: FedEx
Airbill No.:

USACE Location
Buffalo

US Army Corps of Engineers
Buffalo District

Chain of Custody Record

CCC8119

COC No.: Joslyn-05
Page 1 of 1
Date: 15 AUG 2006

Name: USACE - Buffalo District
Address: 1776 Niagara Street
Phone Number: (716) [redacted]
Project Manager: [redacted]
Project Name:
Job/Contract/P.O. #:
Sampler (Signature) [redacted]

Laboratory Name: GEL
Address:
Phone:
Contact:

Field Sample #	Container Type	# Jars	Date	Time	Matrix	Metals	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	*Hyalella azteca*	*Chironomus tentans*	*Lumbriculus variegatus*	Iso-U	Iso-Th		OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
A-22S-F QA	HDPE	1	28 JUL 2006	1625	W													X			
A-22S-U QA	HDPE	1	28 JUL 2006	1625	W													X			
GP260405 QA	Glass	1	03 AUG 06	1830	S													X			
GP-05-0405 QA	GLASS	1	01 AUG 2006	1400	S													X			
GP-160809QA	GLASS	1	02 Aug 06	1634	S														X		

[redacted]

	Date	Received by	Date	Subtotal Number of Containers:
[redacted]	15 AUG 2006	[redacted]	8-16-06	Preservatives for above requested parameters: A. Nitric Acid B. C. D.
USACE (Company)	Time 1600	Company	Time 0930	Methods for above requested parameters: Iso-U (Alpha Spec) Iso-Th (Alpha Spec)
Relinquished by	Date	Received by	Date	
Signature		Signature		
Printed Name	Time	Printed Name	Time	
Company		Company		

Shipment Method:
Airbill No.:

USACE Location

CUR# 3797

Chain of Custody Record

US Army Corps of Engineers ®
Buffalo District

Page 1 of 1

COC No.: Joslyn-01
Date: 15 AUG 2006

Name: USACE - Buffalo District
Address: 1776 Niagara Street
Phone Number: (7[redacted]
Project Manager: [redacted] Cabrera
Project Name: Joslyn
Job/Contract/P.O. #:
Sampler (Signature) [redacted] (Printed Name)

Laboratory Name: STL-St Louis
Address: 13715 River Trail N.
Phone: [redacted]
Contact: [redacted]

Field Sample #	Container Type	# Containers	Date	Time	Matrix	Metals	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	*Hyalella azteca*	*Chironomus tentans*	*Lumbriculus variegatus*	ISO-U			OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
MW-30S-F	HDPE	1	31JUL06	1200	W							[redacted] 08/16/06			LD			X			
MW-34S		1	28JUL06	1110	W																
DUP01		1	26JUL06	1535																	
A-18S-F			27JUL06	1045																	
MW-31D-F			31JUL06	1125																	
MW-16S-F		1	26JUL06	1115																	
A-27S		3	26JUL06	1435									3x LD								MS/MSD for ISO-U
MW-34S-F		1	28JUL06	1110										LD							
[redacted] ~~A-25~~ A-27S-F		3	26JUL06	1435									3x LD								MS/MSD for ISO-U
MW-30S		1	31JUL06	1200										LD							
MW-31D		1	31JUL06	1125																	
MW-38S-F		1	27JUL06	1635																	

Subtotal Number of Containers:

Preservatives for above requested parameters:
A. Nitric Acid
B.
C.
D.

Methods for above requested parameters:
ISO-U (alpha Spec)

Shipment Method: FedEx
Airbill No.:

USACE Location
Buffalo

	Date		Date	
[redacted]	15 Aug 2006	[redacted]	08.16.06	
Printed Name: USACE	Time: 1600	STL St. Louis	Time: 0900	
Company		Company		
Relinquished by	Date	Received by	Date	
Signature		Signature		
Printed Name	Time	Printed Name	Time	
Company		Company		

US Army Corps of Engineers
Buffalo District

Chain of Custody Record

COC No.: JoSlyN-02
Page 1 of 1 Date: 15 AUG/2006

Name: USACE - Buffalo District
Address: 1776 Niagara Street
Phone Number: ([redacted]
Project Manager: [redacted] -Cabrera
Project Name: JoSlyN
Job/Contract/P.O. #:
Sampler (Signature) (Printed Name) [redacted]

Laboratory Name: STL-ST. Louis
Address: 13175 River Trail N.
Phone: [redacted]
Contact:

Requested Parameters

Field Sample #	Container Type	# Jars	Date	Time	Matrix	Metals	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	*Hyalella azteca*	*Chironomus tentans*	*Lumbriculus variegatus*	ISO-U			OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
A-23S	HDPE	1	28JL2006	1525	W													X			LP NM 08.16.06
A-18S			27JUL06	1045																	
MW-38S			27JUL06	1635																	
MW-16S-U			26JUL06	1115																	
~~MW-34S~~ MW-36S 8.16.06			28JL06	1120																	
MW-45S-F-D			30JUL06	1215																	
MW-49S			29JUL06	1430																	
MW-45S-F			30JUL06	1215																	
MW-15S			30JUL06	1135																	
MW-49S-F			29JUL06	1430																	
DUPOL-F			26JUL06	1535																	
MW-32S			29JUL06	1435																	
NEW WELL #2-F			25JUL06	1615																	

Should be 11:10 NM 08.16.06

	Date		Date	
[redacted]	15AUG-2006	[redacted]	08-16-06	
Printed Name: USACE	Time: 1600	Printed Name: STL St. Louis	Time: 0900	
Company		Company		
Relinquished by	Date	Received by	Date	
Signature		Signature		
Printed Name	Time	Printed Name	Time	
Company		Company		

Subtotal Number of Containers:

Preservatives for above requested parameters:
A. Nitric Acid C.
B. D.

Methods for above requested parameters:
ISO-U (alpha Spec)

Shipment Method: FEDEX
Airbill No.:

USACE Location
Buffalo

US Army Corps of Engineers ®
Buffalo District

Chain of Custody Record

COC No.: JOSLYN-03
Page 1 of 1
Date: 15 AUG/2006

Name: USACE - Buffalo District
Address: 1776 N [redacted]
Phone Number:
Project Manager [redacted] -Cabrera
Project Name: JOSLYN
Job/Contract/P.O. #:
Sampler (Signature) (Printed Name)

Laboratory Name:
Address:
Phone:
Contact:

Requested Parameters

Field Sample #	Container Type	# Jars	Date	Time	Matrix	Metals	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	*Hyalella azteca*	*Chironomus tentans*	*Lumbriculus variegatus*	ISO-U			OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
MW-19S	HDPE	1	29JUL06	1040	W													X			CP 08-16-06
MW-19S-F			29JUL06	1040																	
MW-15S-F			30JUL06	1135																	
A-22S-F			28JUL06	1625																	
NEW WELL #1-F			25JUL06	1620																	
A-23S-F -08-16-06			28JUL06	1525																	
A-24S-U			27JUL06	1050																	
A-22S			28JUL06	1625																	
MW-45S			30JUL06	1215																	
MW-17S			26JUL06	1105																	
MW-32S-F			29JUL06	1435																	
NEW WELL #1-U			25JUL06	1620																	
MW-17S-F			26JUL06	1105																	

Subtotal Number of Containers:

Preservatives for above requested parameters:
A. Nitric Acid C.
B. D.

Methods for above requested parameters:
ISO-U (Alpha Spec)

Shipment Method: FEDEX
Airbill No.:

USACE Location

Relinquished by	Date	Time	Received by	Date	Time
[redacted] Printed Name: USACE, Company	Date: 15AUG-2006	Time: 1600	[redacted] Company: STL St. Louis	Date: 08-16-06	Time: 0900
Signature			Signature		
Printed Name		Time	Printed Name		Time
Company			Company		

US Army Corps of Engineers ®
Buffalo District

Chain of Custody Record

Page 1 of 1

COC No.: Joslyn-04
Date: 15 AUG 2006

Name: USACE - Buffalo District
Address: 1776 Niagara [redacted]
Phone Number: (716) [redacted]
Project Manager: [redacted]
Project Name: Joslyn CA52E/04
Job/Contract/P.O. #:
Sampler (Signature) [redacted] (Printed Name)

Laboratory Name: STL-St Louis
Address: 13175 Rider Trail N
Phone: [redacted]
Contact:

MW326-F Field Sample #	Container Type	Preserv.	Date	Time	Matrix	PAHs	Pesticides/PCBs	TOC	Dioxin/Furan	Mirex	Elutriate	Elutraite Water	Particle Size	*Hyalella azteca*	*Chironomus tentans*	*Lumbriculus variegatus*	ISO-U			OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
MW-34S-F	HDPE	1	28JUL2006	1120	W												X			Lp NM 08-16-06
MW-39S-F			27JUL06	1627	W															
A-21S			29JUL06	1100	W															
A-24S-F			27JUL06	1050	W															
MW-39S			27JUL06	1627	W															
MW-45S-D			30JUL06	1215	W															
A-21S-F			29JUL06	1100	W															
New Well #2			25JUL06	1615	W															

[redacted]

	Date	Received by	Date
[redacted]	15 AUG 2006	[redacted]	08-16-06
Printed Name: USACE	Time: 1600	Printed Name: [redacted]	Time: 0900
Company:		Company: STL StLouis	
Relinquished by	Date	Received by	Date
Signature		Signature	
Printed Name	Time	Printed Name	Time
Company		Company	

Subtotal Number of Containers:

Preservatives for above requested parameters:
A. Nitric Acid C.
B. D.

Methods for above requested parameters:
ISO-U (Alpha Spec)

Shipment Method: FED EX
Airbill No.:

USACE Location
Buffalo

APPENDIX C

Data Validation Report

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Water Samples
SDG # F6H160302

Data Package Summary

- There were forty-six (46) samples in the sample delivery group (work order). The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis including isotopic uranium by alpha spectrometry.

Sample Cross Reference

Sample ID	Laboratory Sample ID
MW-30S-F	F6H160302-001
MW-34S	F6H160302-002
DUP01	F6H160302-003
A-185-F	F6H160302-004
MW-31D-F	F6H160302-005
MW-16S-F	F6H160302-006
A-275	F6H160302-007
MW-34S-F	F6H160302-008
A-275-F	F6H160302-009
MW-30S	F6H160302-010
MW-31D	F6H160302-011
MW-38S-F	F6H160302-012
A-235	F6H160302-013
A-18S	F6H160302-014
MW-38S	F6H160302-015
MW-16S-U	F6H160302-016
MW-36S	F6H160302-017
MW-45S-F-D	F6H160302-018
MW-49S	F6H160302-019
MW-45S-F	F6H160302-020
MW-15S	F6H160302-021
MW-49S-F	F6H160302-022
DUP01-F	F6H160302-023
MW-32S	F6H160302-024
NEW WELL #2-F	F6H160302-025
MW-19S	F6H160302-026
MW-19S-F	F6H160302-027
MW-15S-F	F6H160302-028
A-22S-F	F6H160302-029
NEW WELL #1-F	F6H160302-030

USACE - Buffalo District
Data Verification and Validation Report

Joslyn Steel Water Samples
SDG # F6I280110

Data Package Summary

- There were two (2) samples in the sample delivery group (work order). The samples were analyzed by Severn Trent Laboratories – St. Louis for radiological analysis including isotopic uranium by alpha spectrometry. This SDG was created because the laboratory did not analyze the required MS and MSD samples with the original analytical batch (see report for SDG F6H160302). Therefore, these primary samples have already been validated under that SDG. They are presented here only for completeness. It is recommended that the results from the original SDG be used as these will only be considered as confirmatory.

Sample Cross Reference

Sample ID	Laboratory Sample ID
A-275	F6I280110-001
A-275F	F6I280110-002

Data Deliverables Completeness

- All required information was provided. Note: the laboratory data package lists the sample collection date as 9/26/06, but it is actually 7/26/06.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- None

Sample Deviations

- None

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
A-275	U-234	0.99		
	U-235	0.052	J	J
	U-238	0.86		
A-275F	U-234	0.72		
	U-235	0.091	J	J
	U-238	0.71		

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6I280110

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Cabrera Services
Address (City/State): Middletown, NY

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 9/28/2006
Date of Data Package: 10/2/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 10/16/2006
Validation by: [redacted] Date: 10/16/2006

Parameters	Instrumentation
Uranium-234	Alpha spec
Uranium-235	
Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	Joslyn-01
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	Y
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

F6I280110.xls
Date Printed: 10/16/2006

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6271495	U-234	F6I280000-495B							F6I280000-495C	110		
6271495	U-235	F6I280000-495B										
6271495	U-238	F6I280000-495B							F6I280000-495C	106		

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6271495	U-234	F6I280110-001	97			F6I280110-001	104	6						
6271495	U-235													
6271495	U-238	F6I280110-001	102			F6I280110-001	105	2						
	U-234	F6I280110-002	108			F6I280110-002	105	3						
	U-235													
	U-238	F6I280110-002	107			F6I280110-002	105	1						

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6I280110
Severn Trent (STL) St. Louis

Sample ID: A-275
Laboratory Sample ID: F6I280110-001
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.99	0.21	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-234	
Uranium-235	0.052	0.051	0.028	0.1	pCi/L	J	85	Y	Y		J	6271495		J		J	Uranium-235	
Uranium-238	0.86	0.2	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-238	

Sample ID: A-275-F
Laboratory Sample ID: F6I280110-002
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.72	0.17	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-234	
Uranium-235	0.091	0.064	0.027	0.1	pCi/L	J	85	Y	Y		J	6271495		J		J	Uranium-235	
Uranium-238	0.71	0.17	0.02	0.1	pCi/L		85	Y	Y			6271495					Uranium-238	

A-235-F	F6H160302-031
A-24S-U	F6H160302-032
A-22S	F6H160302-033
MW-45-S	F6H160302-034
MW-17S	F6H160302-035
MW-32S-F	F6H160302-036
NEW WELL #1-U	F6H160302-037
MW-17S-F	F6H160302-038
MW-36S-F	F6H160302-039
MW-39S-F	F6H160302-040
A-21S	F6H160302-041
A-24S-F	F6H160302-042
MW-39S	F6H160302-043
MW-45S-D	F6H160302-044
A-21S-F	F6H160302-045
NEW WELL #2	F6H160302-046

Data Deliverables Completeness

- All required information was provided.

Analytical Completeness

- Data completeness was 100%

Analytical Deviations

Instrumentation

- Alpha spec instrumentation was in compliance

Batch QC Deviations

- There were no matrix spike or matrix spike duplicate samples analyzed for this sample delivery group. Two batches have a sample duplicate, while the third batch has a laboratory control sample duplicate to show precision.

Sample Deviations

- Samples A-235 and A-22S-F had U-235 concentrations that were below the uncertainty.

Validated Sample Summary

Sample	Analyte	Result	Lab Qualifier	Validation Qualifier
MW-30S-F	U-234	0.45		
	U-235	0.008	U	U
	U-238	0.33		
MW-34S	U-234	1.16		
	U-235	0.038	U	U
	U-238	1.38		
DUP01	U-234	0.84		
	U-235	0.074	J	J
	U-238	0.95		
A-185-F	U-234	1.22		
	U-235	0.03	U	U
	U-238	1.1		
MW-31D-F	U-234	0	U	U
	U-235	-0.009	U	U
	U-238	0.017	U	U
MW-16S-F	U-234	0.018	U	U
	U-235	-0.003	U	U
	U-238	0.035	U	U
A-275	U-234	1.01		
	U-235	0.081	J	J
	U-238	0.94		
MW-34S-F	U-234	1.27		
	U-235	0.081	J	J
	U-238	1.29		

A-275-F	U-234	0.87		
	U-235	0.039	U	U
	U-238	0.76		
MW-30S	U-234	0.56		
	U-235	0.011	U	U
	U-238	0.36		
MW-31D	U-234	0.03	U	U
	U-235	-0.003	U	U
	U-238	0.017	U	U
MW-38S-F	U-234	0.097	J	J
	U-235	0.003	U	U
	U-238	0.081	J	J
A-235	U-234	1.21		
	U-235	0.053	J	U
	U-238	1.35		
A-18S	U-234	0.99		
	U-235	0.02	U	U
	U-238	1.21		
MW-38S	U-234	0.059	U	U
	U-235	0	U	U
	U-238	0.077	J	J
MW-16S-U	U-234	-0.005	U	U
	U-235	0.009	U	U
	U-238	-0.002	U	U
MW-36S	U-234	0.118		
	U-235	-0.003	U	U
	U-238	0.075	J	J
MW-45S-F-D	U-234	0.27		
	U-235	0.011	U	U
	U-238	0.195		
MW-49S	U-234	0.108		
	U-235	0.008	U	U
	U-238	0.199		

MW-45S-F	U-234	0.205		
	U-235	0.009	U	U
	U-238	0.23		
MW-15S	U-234	0.015	U	U
	U-235	0	U	U
	U-238	0.015	U	U
MW-49S-F	U-234	0.202		
	U-235	0.01	U	U
	U-238	0.15		
DUP01-F	U-234	0.8		
	U-235	0.016	U	U
	U-238	0.72		
MW-32S	U-234	0.68		
	U-235	0.074	J	J
	U-238	0.67		
NEW WELL #2-F	U-234	0.038	U	U
	U-235	0.008	U	U
	U-238	0	U	U
MW-19S	U-234	1.12		
	U-235	0.081	J	J
	U-238	1.4		
MW-19S-F	U-234	1.11		
	U-235	0.084	J	J
	U-238	1.14		
MW-15S-F	U-234	0.072	J	J
	U-235	-0.003	U	U
	U-238	0.025	U	U
A-22S-F	U-234	1.1		
	U-235	0.04	J	U
	U-238	0.88		
NEW WELL #1-F	U-234	2.52		
	U-235	0.157		
	U-238	1.78		

A-235-F	U-234	1.23		
	U-235	0.031	U	U
	U-238	1.18		
A-24S-U	U-234	0.5		
	U-235	0	U	U
	U-238	0.39		
A-22S	U-234	0.95		
	U-235	0.05	U	U
	U-238	0.96		
MW-45-S	U-234	0.147		
	U-235	0.002	U	U
	U-238	0.206		
MW-17S	U-234	0.31		
	U-235	0.018	U	U
	U-238	0.31		
MW-32S-F	U-234	0.54		
	U-235	0.024	U	U
	U-238	0.73		
NEW WELL #1-U	U-234	2.19		
	U-235	0.066	J	J
	U-238	2.06		
MW-17S-F	U-234	0.187		
	U-235	-0.006	U	U
	U-238	0.29		
MW-36S-F	U-234	0.174		
	U-235	0.011	U	U
	U-238	0.129		
MW-39S-F	U-234	0.29		
	U-235	0.029	U	U
	U-238	0.167		
A-21S	U-234	1.02		
	U-235	0.077	J	J
	U-238	0.98		

A-24S-F	U-234	0.18		
	U-235	-0.006	U	U
	U-238	0.209		
MW-39S	U-234	0.211		
	U-235	0.024	U	U
	U-238	0.211		
MW-45S-D	U-234	0.194		
	U-235	0.011	U	U
	U-238	0.194		
A-21S-F	U-234	0.96		
	U-235	0.112		
	U-238	0.87		
NEW WELL #2	U-234	0.021	U	U
	U-235	-0.002	U	U
	U-238	0.006	U	U

USACE - Buffalo District
Data Verification and Validation Form

Verification and Validation Cover Sheet

Project: Joslyn Steel
Job/Contract/P.O.#:

SDG No.: F6H160302

Laboratory Identification: Severn Trent (STL) St. Louis
Address (City/State): Earth City, MO

Contractor Identification: Cabrera Services
Address (City/State): Middletown, NY

Validation Requirements Based On: MARLAP

Date of Sample Reciept: 8/16/2006
Date of Data Package: 8/29/2006
Completeness: 100 (Must be > 90%)

Verification by: [redacted] Date: 10/11/2006
Validation by: [redacted] Date: 10/12/2006

Parameters	Instrumentation
Uranium-234	Alpha spec
Uranium-235	
Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Data Package Checklist

Required Data Package Components

Chain of Custody?:	Y
COC No.:	Joslyn-01, 02, and 03
Cooler Receipt Checklist?:	Y
Sample Preservation OK?:	Y
Cover Sheet listing samples?:	Y
Case narrative including analysis problems?:	Y
Laboratory Project Manager signed narrative?:	Y
Tabulated Results?:	Y
Analytical Results for QC Samples?:	Y
Lab. Duplicates run at least once per 20 samples?:	Y
Matrix Spike Dup. run at least once per 20 samples?:	N
Tabulation of MDLs in water?:	N
Run logs included?:	Y
10% of calculations checked by Verifier?:	N

USACE - Buffalo District
Data Verification and Validation Form

Instrument Checklist

	Alpha spec									
Basic calibration:										
Calibration file/files identified for all detectors or listing of efficiency determination present?	Y									
Continuing calibration:										
Efficiency control check given as percent difference from calibration?	N									
Control charts or other documentation of instrument background provided?	Y									
For Gross Alpha Beta, documentation of self-adsorption factors and cross-talk factors?	NA									

Compliance Listing	Non-compliance details or comments
Alpha spec instrument is in compliance with requirements.	%D not given, but QAPP doesn't request it. Daily pulsers given as pass/fail

USACE - Buffalo District
Data Verification and Validation Form

Batch QC Verification and Validation

Batch	Isotope or Element	Method Blank			Duplicate				Laboratory Control Sample			
		<MDC			% RPD <30				70< % Recovery <130			
		ID	Ver. Code	Val. Code (B+/-)	ID	% RPD	Ver. Code	Val. Code (P)	ID	% Recovery	Ver. Code	Val. Code (S+/-)
6233483	U-234	F6H210000-483B			F6H160302-007	5			F6H210000-483C	117		
6233483	U-235	F6H210000-483B			F6H160302-007	U						
6233483	U-238	F6H210000-483B			F6H160302-007	6			F6H210000-483C	109		
6233520	U-234	F6H210000-520B			F6H160302-009	2			F6H210000-520B	93		
6233520	U-235	F6H210000-520B			F6H160302-009	U						
6233520	U-238	F6H210000-520B			F6H160302-009	13			F6H210000-520B	82		
6236379	U-234	F6H240000-379B							F6H240000-379B	95		
6236379	U-235	F6H240000-379B										
6236379	U-238	F6H240000-379B							F6H240000-379B	100		
									LCSD:	111		
										110		
									RPD:	16		
										10		

Batch QC Verification and Validation

Batch	Isotope or Element	Matrix Spike				Matrix Spike Duplicate					Instrument		Summary	
		70< % Recovery <130				% RPD <30								
		ID	% Recovery	Ver. Code	Val. Code (S+/-)	Matrix Spike Duplicate ID	% Recovery	% RPD	Ver. Code	Val. Code (S+/-)	Ver. Code	Val. Code (J)	Ver. Code	Val. Code
6233483	U-234	No MS				No MSD								
6233483	U-235	No MS				No MSD								
6233483	U-238	No MS				No MSD								
6233520	U-234	No MS				No MSD								
6233520	U-235	No MS				No MSD								
6233520	U-238	No MS				No MSD								
6236379	U-234	No MS				No MSD								
6236379	U-235	No MS				No MSD								
6236379	U-238	No MS				No MSD								

USACE - Buffalo District
Data Verification and Validation Form

Sample QC

Joslyn Steel
F6H160302
Severn Trent (STL) St. Louis

Sample ID: MW-30S-F
Laboratory Sample ID: F6H160302-001
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.45	0.14	0.04	0.1	pCi/L		82	Y	Y			6233483					Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.33	0.12	0.05	0.1	pCi/L		82	Y	Y			6233483					Uranium-238	

Sample ID: MW-34S
Laboratory Sample ID: F6H160302-002
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.16	0.26	0.05	0.1	pCi/L		86	Y	Y			6233483					Uranium-234	
Uranium-235	0.038	0.042	0.046	0.1	pCi/L	U	86	Y	Y		U	6233483		U		U	Uranium-235	
Uranium-238	1.38	0.29	0.02	0.1	pCi/L		86	Y	Y			6233483					Uranium-238	

Sample ID: DUP01
Laboratory Sample ID: F6H160302-003
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.84	0.21	0.05	0.1	pCi/L		83	Y	Y			6233483					Uranium-234	
Uranium-235	0.074	0.061	0.029	0.1	pCi/L	J	83	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	0.95	0.22	0.04	0.1	pCi/L		83	Y	Y			6233483					Uranium-238	

Sample ID: A-185-F
Laboratory Sample ID: F6H160302-004
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.22	0.3	0.10	0.1	pCi/L		60	Y	Y			6233483					Uranium-234	
Uranium-235	0.03	0.053	0.08	0.1	pCi/L	U	60	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	1.1	0.28	0.06	0.1	pCi/L		60	Y	Y			6233483					Uranium-238	

Sample ID: MW-31D-F
Laboratory Sample ID: F6H160302-005
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0	0	0.06	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.009	0.032	0.071	0.1	pCi/L	U	73	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.017	0.029	0.04	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: MW-16S-F
Laboratory Sample ID: F6H160302-006
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.018	0.043	0.069	0.1	pCi/L	U	77	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.003	0.033	0.074	0.1	pCi/L	U	77	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.035	0.043	0.056	0.1	pCi/L	U	77	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: A-275
Laboratory Sample ID: F6H160302-007
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.01	0.25	0.07	0.1	pCi/L		73	Y	Y			6233483					Uranium-234	
Uranium-235	0.081	0.066	0.054	0.1	pCi/L	J	73	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	0.94	0.24	0.05	0.1	pCi/L		73	Y	Y			6233483					Uranium-238	

Sample ID: MW-34S-F
Laboratory Sample ID: F6H160302-008
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.27	0.29	0.05	0.1	pCi/L		77	Y	Y			6233483					Uranium-234	
Uranium-235	0.081	0.067	0.031	0.1	pCi/L	J	77	Y	Y		J	6233483		J		J	Uranium-235	
Uranium-238	1.29	0.29	0.05	0.1	pCi/L		77	Y	Y			6233483					Uranium-238	

Sample ID: A-275-F
Laboratory Sample ID: F6H160302-009
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.87	0.21	0.07	0.1	pCi/L		80	Y	Y			6233520					Uranium-234	
Uranium-235	0.039	0.053	0.072	0.1	pCi/L	U	80	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.76	0.19	0.05	0.1	pCi/L		80	Y	Y			6233520					Uranium-238	

Sample ID: MW-30S
Laboratory Sample ID: F6H160302-010
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.56	0.16	0.05	0.1	pCi/L		84	Y	Y			6233483					Uranium-234	
Uranium-235	0.011	0.037	0.068	0.1	pCi/L	U	84	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.36	0.13	0.06	0.1	pCi/L		84	Y	Y			6233483					Uranium-238	

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Sample ID: MW-31D
Laboratory Sample ID: F6H160302-011
Sample Collection Date: 7/31/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.03	0.044	0.063	0.1	pCi/L	U	69	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	-0.003	0.027	0.056	0.1	pCi/L	U	69	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.017	0.041	0.067	0.1	pCi/L	U	69	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-38S-F
Laboratory Sample ID: F6H160302-012
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.097	0.07	0.067	0.1	pCi/L	J	76	Y	Y		J	6233483		J		J	Uranium-234	
Uranium-235	0.003	0.031	0.068	0.1	pCi/L	U	76	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.081	0.058	0.042	0.1	pCi/L	J	76	Y	Y		J	6233483		J		J	Uranium-238	

Sample ID: A-235
Laboratory Sample ID: F6H160302-013
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.21	0.29	0.06	0.1	pCi/L		73	Y	Y			6233483					Uranium-234	
Uranium-235	0.053	0.06	0.036	0.1	pCi/L	J	73	Y	Y		U	6233483		U		U	Uranium-235	Sample result is less than the uncertainty
Uranium-238	1.35	0.32	0.05	0.1	pCi/L		73	Y	Y			6233483					Uranium-238	

Sample ID: A-18S
Laboratory Sample ID: F6H160302-014
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.99	0.26	0.07	0.1	pCi/L		72	Y	Y			6233483					Uranium-234	
Uranium-235	0.02	0.043	0.072	0.1	pCi/L	U	72	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	1.21	0.3	0.03	0.1	pCi/L		72	Y	Y			6233483					Uranium-238	

Sample ID: MW-38S
Laboratory Sample ID: F6H160302-015
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recov-ery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verifi-cation code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.059	0.056	0.065	0.1	pCi/L	U	79	Y	Y		U	6233483		U		U	Uranium-234	
Uranium-235	0	0	0.030	0.1	pCi/L	U	79	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.077	0.057	0.048	0.1	pCi/L	J	79	Y	Y		J	6233483		J		J	Uranium-238	

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Sample ID: MW-16S-U
Laboratory Sample ID: F6H160302-016
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	-0.005	0.024	0.053	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	0.009	0.028	0.056	0.1	pCi/L	U	73	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	-0.002	0.03	0.068	0.1	pCi/L	U	73	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-36S
Laboratory Sample ID: F6H160302-017
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.118	0.07	0.052	0.1	pCi/L		79	Y	Y			6233483					Uranium-234	
Uranium-235	-0.003	0.025	0.050	0.1	pCi/L	U	79	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.075	0.056	0.047	0.1	pCi/L	J	79	Y	Y		J	6233483		J		J	Uranium-238	

Sample ID: MW-45S-F-D
Laboratory Sample ID: F6H160302-018
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.27	0.11	0.06	0.1	pCi/L		77	Y	Y			6233483					Uranium-234	
Uranium-235	0.011	0.032	0.031	0.1	pCi/L	U	77	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.195	0.094	0.065	0.1	pCi/L		77	Y	Y			6233483					Uranium-238	

Sample ID: MW-49S
Laboratory Sample ID: F6H160302-019
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.108	0.064	0.039	0.1	pCi/L		82	Y	Y			6233483					Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.199	0.089	0.045	0.1	pCi/L		82	Y	Y			6233483					Uranium-238	

Sample ID: MW-45S-F
Laboratory Sample ID: F6H160302-020
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.205	0.096	0.06	0.1	pCi/L		76	Y	Y			6233483					Uranium-234	
Uranium-235	0.009	0.026	0.053	0.1	pCi/L	U	76	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.23	0.1	0.03	0.1	pCi/L		76	Y	Y			6233483					Uranium-238	

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Sample ID: MW-15S
Laboratory Sample ID: F6H160302-021
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.015	0.031	0.052	0.1	pCi/L	U	72	Y	N		U	6233483		U		U	Uranium-234	
Uranium-235	0	0	0.030	0.1	pCi/L	U	72	Y	N	E	U	6233483		U		U	Uranium-235	
Uranium-238	0.015	0.031	0.052	0.1	pCi/L	U	72	Y	N		U	6233483		U		U	Uranium-238	

Sample ID: MW-49S-F
Laboratory Sample ID: F6H160302-022
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.202	0.088	0.047	0.1	pCi/L		97	Y	Y			6233520					Uranium-234	
Uranium-235	0.01	0.028	0.027	0.1	pCi/L	U	97	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.15	0.073	0.036	0.1	pCi/L		97	Y	Y			6233520					Uranium-238	

Sample ID: DUP01-F
Laboratory Sample ID: F6H160302-023
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.8	0.2	0.06	0.1	pCi/L		93	Y	Y			6233520					Uranium-234	
Uranium-235	0.016	0.033	0.056	0.1	pCi/L	U	93	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.72	0.19	0.02	0.1	pCi/L		93	Y	Y			6233520					Uranium-238	

Sample ID: MW-32S
Laboratory Sample ID: F6H160302-024
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.68	0.18	0.060	0.1	pCi/L		84	Y	Y			6233520					Uranium-234	
Uranium-235	0.074	0.061	0.029	0.1	pCi/L	J	84	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	0.67	0.18	0.050	0.1	pCi/L		84	Y	Y			6233520					Uranium-238	

Sample ID: New Well #2-F
Laboratory Sample ID: F6H160302-025
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.038	0.04	0.045	0.1	pCi/L	U	82	Y	Y		U	6233520		U		U	Uranium-234	
Uranium-235	0.008	0.024	0.048	0.1	pCi/L	U	82	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0	0	0.02	0.1	pCi/L	U	82	Y	N		U	6233520		U		U	Uranium-238	

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Sample ID: MW-19S
Laboratory Sample ID: F6H160302-026
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.12	0.28	0.07	0.1	pCi/L		63	Y	Y			6233520					Uranium-234	
Uranium-235	0.081	0.073	0.037	0.1	pCi/L	J	63	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	1.4	0.33	0.06	0.1	pCi/L		63	Y	Y			6233520					Uranium-238	

Sample ID: MW-19S-F
Laboratory Sample ID: F6H160302-027
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.11	0.27	0.05	0.1	pCi/L		68	Y	Y			6233520					Uranium-234	
Uranium-235	0.084	0.068	0.057	0.1	pCi/L	J	68	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	1.14	0.27	0.06	0.1	pCi/L		68	Y	Y			6233520					Uranium-238	

Sample ID: MW-15S-F
Laboratory Sample ID: F6H160302-028
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.072	0.06	0.059	0.1	pCi/L	J	70	Y	Y		J	6233520		J		J	Uranium-234	
Uranium-235	-0.003	0.028	0.056	0.1	pCi/L	U	70	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.025	0.037	0.053	0.1	pCi/L	U	70	Y	N		U	6233520		U		U	Uranium-238	

Sample ID: A-22S-F
Laboratory Sample ID: F6H160302-029
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.1	0.28	0.07	0.1	pCi/L		66	Y	Y			6233520					Uranium-234	
Uranium-235	0.04	0.053	0.036	0.1	pCi/L	J	66	Y	N	E	U	6233520		U		U	Uranium-235	Sample result is less than the uncertainty
Uranium-238	0.88	0.24	0.08	0.1	pCi/L		66	Y	Y			6233520					Uranium-238	

Sample ID: New Well #1-F
Laboratory Sample ID: F6H160302-030
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	2.52	0.47	0.04	0.1	pCi/L		76	Y	Y			6233520					Uranium-234	
Uranium-235	0.157	0.089	0.052	0.1	pCi/L		76	Y	Y			6233520					Uranium-235	
Uranium-238	1.78	0.36	0.05	0.1	pCi/L		76	Y	Y			6233520					Uranium-238	

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Sample ID: A-235-F
Laboratory Sample ID: F6H160302-031
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.23	0.28	0.06	0.1	pCi/L		77	Y	Y			6233520					Uranium-234	
Uranium-235	0.031	0.042	0.052	0.1	pCi/L	U	77	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	1.18	0.27	0.02	0.1	pCi/L		77	Y	Y			6233520					Uranium-238	

Sample ID: A-24S-U
Laboratory Sample ID: F6H160302-032
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.5	0.21	0.09	0.1	pCi/L		40	Y	Y			6233520					Uranium-234	
Uranium-235	0	0	0.06	0.1	pCi/L	U	40	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.39	0.18	0.09	0.1	pCi/L		40	Y	Y			6233520					Uranium-238	

Sample ID: A-22S
Laboratory Sample ID: F6H160302-033
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.95	0.24	0.09	0.1	pCi/L		71	Y	Y			6233520					Uranium-234	
Uranium-235	0.05	0.056	0.069	0.1	pCi/L	U	71	Y	Y		U	6233520		U		U	Uranium-235	
Uranium-238	0.96	0.24	0.06	0.1	pCi/L		71	Y	Y			6233520					Uranium-238	

Sample ID: MW-45-S
Laboratory Sample ID: F6H160302-034
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.147	0.074	0.049	0.1	pCi/L		92	Y	Y			6233520					Uranium-234	
Uranium-235	0.002	0.025	0.057	0.1	pCi/L	U	92	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.206	0.085	0.035	0.1	pCi/L		92	Y	Y			6233520					Uranium-238	

Sample ID: MW-17S
Laboratory Sample ID: F6H160302-035
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.31	0.11	0.04	0.1	pCi/L		104	Y	Y			6233520					Uranium-234	
Uranium-235	0.018	0.031	0.024	0.1	pCi/L	U	104	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.31	0.1	0.03	0.1	pCi/L		104	Y	Y			6233520					Uranium-238	

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Sample ID: MW-32S-F
Laboratory Sample ID: F6H160302-036
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.54	0.16	0.06	0.1	pCi/L		81	Y	Y			6233520					Uranium-234	
Uranium-235	0.024	0.042	0.063	0.1	pCi/L	U	81	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.73	0.19	0.04	0.1	pCi/L		81	Y	Y			6233520					Uranium-238	

Sample ID: New Well #1-U
Laboratory Sample ID: F6H160302-037
Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	2.19	0.42	0.05	0.1	pCi/L		88	Y	Y			6233520					Uranium-234	
Uranium-235	0.066	0.059	0.03	0.1	pCi/L	J	88	Y	Y		J	6233520		J		J	Uranium-235	
Uranium-238	2.06	0.4	0.04	0.1	pCi/L		88	Y	Y			6233520					Uranium-238	

Sample ID: MW-17S-F
Laboratory Sample ID: F6H160302-038
Sample Collection Date: 7/26/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.187	0.091	0.062	0.1	pCi/L		87	Y	Y			6233520					Uranium-234	
Uranium-235	-0.006	0.028	0.060	0.1	pCi/L	U	87	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.29	0.11	0.020	0.1	pCi/L		87	Y	Y			6233520					Uranium-238	

Sample ID: MW-36S-F
Laboratory Sample ID: F6H160302-039
Sample Collection Date: 7/28/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.174	0.088	0.064	0.1	pCi/L		80	Y	Y			6233520					Uranium-234	
Uranium-235	0.011	0.031	0.030	0.1	pCi/L	U	80	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.129	0.073	0.047	0.1	pCi/L		80	Y	Y			6233520					Uranium-238	

Sample ID: MW-39S-F
Laboratory Sample ID: F6H160302-040
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.29	0.11	0.040	0.1	pCi/L		83	Y	Y			6233520					Uranium-234	
Uranium-235	0.029	0.038	0.047	0.1	pCi/L	U	83	Y	N	E	U	6233520		U		U	Uranium-235	
Uranium-238	0.167	0.08	0.023	0.1	pCi/L		83	Y	Y			6233520					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: A-21S
Laboratory Sample ID: F6H160302-041
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	1.02	0.26	0.05	0.1	pCi/L		65	Y	Y			6236379					Uranium-234	
Uranium-235	0.077	0.068	0.061	0.1	pCi/L	J	65	Y	Y		J	6236379		J		J	Uranium-235	
Uranium-238	0.98	0.25	0.06	0.1	pCi/L		65	Y	Y			6236379					Uranium-238	

Sample ID: A-24S-F
Laboratory Sample ID: F6H160302-042
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.18	0.088	0.049	0.1	pCi/L		74	Y	Y			6236379					Uranium-234	
Uranium-235	-0.006	0.028	0.061	0.1	pCi/L	U	74	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.209	0.094	0.042	0.1	pCi/L		74	Y	Y			6236379					Uranium-238	

Sample ID: MW-39S
Laboratory Sample ID: F6H160302-043
Sample Collection Date: 7/27/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.211	0.097	0.044	0.1	pCi/L		72	Y	Y			6236379					Uranium-234	
Uranium-235	0.024	0.042	0.033	0.1	pCi/L	U	72	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.211	0.096	0.044	0.1	pCi/L		72	Y	Y			6236379					Uranium-238	

Sample ID: MW-45S-D
Laboratory Sample ID: F6H160302-044
Sample Collection Date: 7/30/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.194	0.089	0.024	0.1	pCi/L		79	Y	Y			6236379					Uranium-234	
Uranium-235	0.011	0.031	0.030	0.1	pCi/L	U	79	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.194	0.089	0.024	0.1	pCi/L		79	Y	Y			6236379					Uranium-238	

Sample ID: A-21S-F
Laboratory Sample ID: F6H160302-045
Sample Collection Date: 7/29/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.96	0.24	0.06	0.1	pCi/L		72	Y	Y			6236379					Uranium-234	
Uranium-235	0.112	0.08	0.034	0.1	pCi/L		72	Y	Y			6236379					Uranium-235	
Uranium-238	0.87	0.23	0.05	0.1	pCi/L		72	Y	Y			6236379					Uranium-238	

USACE - Buffalo District
Data Verification and Validation Form

Sample ID: New Well #2
Laboratory Sample ID: F6H160302-046

Sample Collection Date: 7/25/2006

Parameter	Result	TPU	DL	RL	Units	Lab Codes	Tracer Recovery? (J)	Holding times met? (J)	Detected ? (U)	Ver. Code	Val. Code	Batch	Verification code	Provisional Validation Codes Sample	Provisional Validation Codes Batch	Final Validation Code	Parameter	Validation Comments
Uranium-234	0.021	0.028	0.035	0.1	pCi/L	U	89	Y	N		U	6236379		U		U	Uranium-234	
Uranium-235	-0.002	0.021	0.043	0.1	pCi/L	U	89	Y	N	E	U	6236379		U		U	Uranium-235	
Uranium-238	0.006	0.017	0.035	0.1	pCi/L	U	89	Y	N		U	6236379		U		U	Uranium-238	

US Army Corps of Engineers®
Buffalo District

Site Inspection Report

Appendix D

Soil Sample Data Reports and Logs

Joslyn Manufacturing Site
Fort Wayne, Indiana

Prepared by:

U.S. Army Corps of Engineers,
Buffalo District
Date: 1 May 2007

SEVERN TRENT STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 93631

Joslyn

Lot #: F6H050196

[redacted]

Earth Tech, Inc.
300 Broadacres Drive
Bloomfield, NJ 07003

SEVERN TRENT LABORATORIES, INC.

[redacted]
Project Manager

August 21, 2006

Leaders in Environmental Testing

Severn Trent Laboratories, Inc.

Case Narrative
LOT NUMBER: **F6H050196**

This report contains the analytical results for the 37 samples received under chain of custody by STL St. Louis on August 5, 2006. These samples are associated with your Joslyn project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Iso Uranium Method: A-01-R MOD

The sample spectrum for uranium was compromised due to high activity in the Uranium-238 and Uranium-234 region. Samples were re-extracted with a 1:15 dilution.
Affected Samples:
F6H050196 (28): GP030001
F6H050196 (29): GP040102

Sample spectrum was compromised due to high activity of uranium in the sample. The sample was re-extracted and reported. The MS recovery was also outside the established QC limits. The analyte concentration in the original sample is greater than 4 times the amount spiked, making % recovery information statistically invalid. Method performance is demonstrated by acceptable LCS recovery. Results are provided with this narrative.
Affected Sample:
F6H050196 (26): GP010001

Mercury Method: 7470A

Batch 6227070-Totals
The MS recovery was outside the established QC limits. The RPD is within method acceptance criteria indicating a possible matrix interference. Method performance is demonstrated by acceptable LCS recovery.
Affected Sample:
F6H050196 (13): 1DW-AQUEOUS-01

VOA Method: 8260B

Batch 6227126
The LCS/LCSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable LCS/LCSD recoveries.

The LCS/LCSD RPDs for four compounds are not within method acceptance criteria. Their recoveries are within QC limits demonstrating good extraction performance in the sample matrix.

The MS/MSD recoveries are outside QC limits for less than 10% of the compounds spiked. Laboratory QC practices, based on federal guidance documents, allow for up to 10% of the spike compounds to be outside QC criteria without necessitating re-preparation/re-analysis. Sample purge efficiency and compliance is demonstrated by the remaining acceptable MS/MSD recoveries.

The sample was analyzed at dilution due to high concentrations of target analytes. The reporting limits have been adjusted only for those targets reported from the dilution run.

The D% in CCV recovery was outside the QC limit (greater than 20% D) for Acrolein (91.1% high) indicating a potential high bias for those analytes in the samples associated with this CCV. The analyte was not detected above the reporting limit in the associated samples.
Affected Sample:
F6H050196 (13): 1DW-AQUEOUS-01

METHODS SUMMARY

F6H050196

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 1311/3010
Isotopic Thorium by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Uranium by Alpha Spectroscopy	EML A-01-R MOD	
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A	SW846 1311/7470
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A	SW846 7470A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	
Volatile Organics by GC/MS	SW846 8260B	SW846 1311/5030
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B/826

References:

EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL" HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

F6H050196

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JAQLT	001	HA030002	08/01/06	18:15
JAQLV	002	HA040002	08/01/06	18:30
JAQLW	003	HA050002	08/01/06	19:11
JAQLX	004	GP110405	08/02/06	10:10
JAQL0	005	GP130506	08/02/06	11:45
JAQL1	006	GP150304	08/02/06	14:00
JAQL2	007	GP160809	08/02/06	16:34
JAQL3	008	GP170405	08/02/06	17:25
JAQL4	009	GP180304	08/02/06	18:00
JAQL5	010	GP190304	08/02/06	18:40
JAQL6	011	GP210405	08/03/06	12:33
JAQL7	012	GP220405	08/03/06	13:30
JAQL8	013	1DW-AQUEOUS-01	08/03/06	20:00
JAQL9	014	1DW-SOIL-03	08/03/06	20:00
JAQMA	015	GP230506	08/03/06	14:20
JAQME	016	GP240506	08/03/06	15:10
JAQMH	017	GP250405	08/03/06	17:40
JAQMK	018	GP260405	08/03/06	18:30
JAQML	019	GP270405	08/03/06	19:10
JAQMN	020	GP540102	08/01/06	09:00
JAQMR	021	GP590405	08/01/06	08:30
JAQMT	022	GP670405	08/02/06	07:25
JAQMW	023	GP710405	08/03/06	10:00
JAQM0	024	GP730506	08/03/06	09:30
JAQM3	025	GP770506	08/03/06	19:10
JAQM7	026	GP010001	08/01/06	10:26
JAQNC	027	GP020506	08/01/06	11:15
JAQND	028	GP030001	08/01/06	11:50
JAQNE	029	GP040102	08/01/06	12:25
JAQNF	030	GP050405	08/01/06	14:00
JAQNG	031	GP060405	08/01/06	14:40
JAQNH	032	GP070506	08/01/06	15:10
JAQNK	033	GP080405	08/01/06	15:45
JAQNM	034	GP090405	08/01/06	16:15
JAQNN	035	GP100708	08/01/06	17:08
JAQNQ	036	HA010002	08/01/06	

(Continued on next page)

SAMPLE SUMMARY

F6H050196

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JAQNR	037	HA020002	08/01/06	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Earth Tech, Inc.

Client Sample ID: 1DW-AQUEOUS-01

GC/MS Volatiles

Lot-Sample #...: F6H050196-013 **Work Order #...:** JAQL81AL **Matrix.....:** WATER
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06
Prep Date.....: 08/11/06 **Analysis Date..:** 08/11/06
Prep Batch #...: 6227126 **Analysis Time..:** 21:56
Dilution Factor: 10

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Dibromochloromethane	ND	100	ug/L
Tetrachloroethene	ND	100	ug/L
2-Hexanone	ND	500	ug/L
1,2-Dibromoethane	ND	100	ug/L
Chlorobenzene	ND	100	ug/L
Ethylbenzene	ND	100	ug/L
Xylenes (total)	ND	300	ug/L
Styrene	ND	100	ug/L
Bromoform	ND	100	ug/L
Isopropylbenzene	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
1,3-Dichlorobenzene	ND	100	ug/L
1,4-Dichlorobenzene	ND	100	ug/L
1,2-Dichlorobenzene	ND	100	ug/L
1,2-Dibromo-3-chloro-propane	ND	100	ug/L
1,2,4-Trichloro-benzene	ND	100	ug/L
2-Butanone	ND	500	ug/L
Chloroform	ND	100	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
Cyclohexane	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Benzene	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
Trichloroethene	**810 D,E**	**100**	**ug/L**
Methylcyclohexane	ND	400	ug/L
1,2-Dichloropropane	ND	100	ug/L
Bromodichloromethane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
4-Methyl-2-pentanone	ND	500	ug/L
Toluene	**21 J,D**	**100**	**ug/L**
trans-1,3-Dichloropropene	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
Trichlorofluoromethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	100	ug/L

(Continued on next page)

Earth Tech, Inc.

Client Sample ID: 1DW-AQUEOUS-01

GC/MS Volatiles

Lot-Sample #...: F6H050196-013 **Work Order #...:** JAQL81AL **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon disulfide	ND	100	ug/L
Methyl acetate	ND	500	ug/L
Methylene chloride	**18 J,B,D**	**100**	**ug/L**
trans-1,2-Dichloroethene	**17 J,D**	**100**	**ug/L**
Methyl tert-butyl ether	ND	200	ug/L
1,1-Dichloroethane	ND	100	ug/L
cis-1,2-Dichloroethene	**740 D,E**	**100**	**ug/L**
Dichlorodifluoromethane	ND	200	ug/L
Chloromethane	ND	200	ug/L
Vinyl chloride	ND D	200	ug/L
Bromomethane	ND	200	ug/L
Chloroethane	ND	200	ug/L
Acetone	ND	200	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	98	(66 - 131)
Dibromofluoromethane	112	(69 - 135)
1,2-Dichloroethane-d4	107	(69 - 132)
4-Bromofluorobenzene	91	(66 - 119)

NOTE(S):

D Result was obtained from the analysis of a dilution.

E Estimated result. Result concentration exceeds the calibration range.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Earth Tech, Inc.

Client Sample ID: 1DW-AQUEOUS-01

GC/MS Volatiles

Lot-Sample #...: F6H050196-013 **Work Order #...:** JAQL82AL **Matrix.....:** WATER
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06
Prep Date.....: 08/11/06 **Analysis Date..:** 08/11/06
Prep Batch #...: 6227126 **Analysis Time..:** 18:13
Dilution Factor: 100

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Trichloroethene	**800 D**	**100**	**ug/L**
cis-1,2-Dichloroethene	**710 D**	**100**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	97	(66 - 131)
Dibromofluoromethane	103	(69 - 135)
1,2-Dichloroethane-d4	105	(69 - 132)
4-Bromofluorobenzene	95	(66 - 119)

NOTE(S):

D Result was obtained from the analysis of a dilution.

Earth Tech, Inc.

Client Sample ID: 1DW-AQUEOUS-01

TOTAL Metals

Lot-Sample #...: F6H050196-013 **Matrix.....:** WATER
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6220218						
Silver	**137**	**10**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AF**
		Dilution Factor: 1		Analysis Time..: 14:09		
Arsenic	**79.5**	**10**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AC**
		Dilution Factor: 1		Analysis Time..: 14:09		
Barium	**410**	**200**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AG**
		Dilution Factor: 1		Analysis Time..: 14:09		
Cadmium	ND	5	ug/L	SW846 6010B	08/08-08/09/06	JAQL81AD
		Dilution Factor: 1		Analysis Time..: 14:09		
Chromium	**350**	**10**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AE**
		Dilution Factor: 1		Analysis Time..: 14:09		
Lead	**270**	**10**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AH**
		Dilution Factor: 1		Analysis Time..: 14:09		
Selenium	**9.9 B**	**15**	**ug/L**	**SW846 6010B**	**08/08-08/09/06**	**JAQL81AJ**
		Dilution Factor: 1		Analysis Time..: 14:09		
Prep Batch #...: 6227070						
Mercury	**0.19 BN**	**0.2**	**ug/L**	**SW846 7470A**	**08/15/06**	**JAQL81AK**
		Dilution Factor: 1		Analysis Time..: 12:57		

NOTE(S):

B Estimated result. Result is less than RL.

Earth Tech, Inc.

Client Sample ID: 1DW-SOIL-03

TCLP GC/MS Volatiles

Lot-Sample #...: F6H050196-014 **Work Order #...:** JAQL91AL **Matrix.....:** SOLID
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06
Leach Date.....: 08/08/06 **Prep Date.....:** 08/10/06 **Analysis Date..:** 08/10/06
Leach Batch #..: P622010 **Prep Batch #...:** 6225056 **Analysis Time..:** 14:39
Dilution Factor: 1
% Moisture.....: **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	50	ug/L
Benzene	ND	50	ug/L
Chlorobenzene	ND	50	ug/L
Chloroform	ND	50	ug/L
1,1-Dichloroethene	ND	50	ug/L
Tetrachloroethylene	ND	50	ug/L
1,2-Dichloroethane	ND	50	ug/L
Trichloroethylene	**160**	**50**	**ug/L**
Vinyl chloride	ND	100	ug/L
Methyl ethyl ketone (MEK)	ND	50	ug/L
1,4-Dichlorobenzene	ND	50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	113	(72 - 129)
Toluene-d8	106	(65 - 131)
4-Bromofluorobenzene	107	(62 - 128)
1,2-Dichloroethane-d4	112	(67 - 133)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

Earth Tech, Inc.

Client Sample ID: 1DW-SOIL-03

TCLP Metals

Lot-Sample #...: F6H050196-014 **Matrix.....:** SOLID
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 6223249						
Arsenic	ND	500	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AC
		Dilution Factor: 1		Analysis Time..: 13:17		
Barium	**518**	**125**	**ug/L**	**SW846 6010B**	**08/11-08/14/06**	**JAQL91AD**
		Dilution Factor: 1		Analysis Time..: 13:17		
Chromium	ND	25	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AE
		Dilution Factor: 1		Analysis Time..: 13:17		
Lead	ND	250	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AF
		Dilution Factor: 1		Analysis Time..: 13:17		
Cadmium	ND	12.5	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AG
		Dilution Factor: 1		Analysis Time..: 13:17		
Selenium	ND	500	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AH
		Dilution Factor: 1		Analysis Time..: 13:17		
Silver	ND	25	ug/L	SW846 6010B	08/11-08/14/06	JAQL91AJ
		Dilution Factor: 1		Analysis Time..: 13:17		
Prep Batch #...: 6223306						
Mercury	ND	10	ug/L	SW846 7470A	08/11/06	JAQL91AK
		Dilution Factor: 1		Analysis Time..: 18:39		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AA **Matrix.....:** WATER
MB Lot-Sample #: F6H150000-126

Prep Date.....: 08/11/06 **Analysis Time..:** 14:57
Analysis Date..: 08/11/06 **Prep Batch #...:** 6227126
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Dibromochloromethane	ND	10	ug/L	SW846 8260B
Tetrachloroethene	ND	10	ug/L	SW846 8260B
2-Hexanone	ND	50	ug/L	SW846 8260B
1,2-Dibromoethane	ND	10	ug/L	SW846 8260B
Chlorobenzene	ND	10	ug/L	SW846 8260B
Ethylbenzene	ND	10	ug/L	SW846 8260B
Xylenes (total)	ND	30	ug/L	SW846 8260B
Styrene	**0.31 J**	**10**	**ug/L**	**SW846 8260B**
Bromoform	ND	10	ug/L	SW846 8260B
Isopropylbenzene	ND	10	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	10	ug/L	SW846 8260B
1,3-Dichlorobenzene	ND	10	ug/L	SW846 8260B
1,4-Dichlorobenzene	ND	10	ug/L	SW846 8260B
1,2-Dichlorobenzene	ND	10	ug/L	SW846 8260B
1,2-Dibromo-3-chloro-propane	ND	10	ug/L	SW846 8260B
1,2,4-Trichloro-benzene	ND	10	ug/L	SW846 8260B
2-Butanone	ND	50	ug/L	SW846 8260B
Chloroform	ND	10	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	10	ug/L	SW846 8260B
Cyclohexane	ND	10	ug/L	SW846 8260B
Carbon tetrachloride	ND	10	ug/L	SW846 8260B
Benzene	ND	10	ug/L	SW846 8260B
1,2-Dichloroethane	ND	10	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Methylcyclohexane	ND	40	ug/L	SW846 8260B
1,2-Dichloropropane	ND	10	ug/L	SW846 8260B
Bromodichloromethane	ND	10	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	10	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	50	ug/L	SW846 8260B
Toluene	ND	10	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	10	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	10	ug/L	SW846 8260B
Trichlorofluoromethane	ND	10	ug/L	SW846 8260B
1,1-Dichloroethene	ND	10	ug/L	SW846 8260B
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10	ug/L	SW846 8260B
Carbon disulfide	ND	10	ug/L	SW846 8260B
Methyl acetate	ND	50	ug/L	SW846 8260B
Methylene chloride	**1.5 J**	**10**	**ug/L**	**SW846 8260B**

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
trans-1,2-Dichloroethene	ND	10	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	20	ug/L	SW846 8260B
1,1-Dichloroethane	ND	10	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
Dichlorodifluoromethane	ND	20	ug/L	SW846 8260B
Chloromethane	ND	20	ug/L	SW846 8260B
Vinyl chloride	ND	20	ug/L	SW846 8260B
Bromomethane	ND	20	ug/L	SW846 8260B
Chloroethane	ND	20	ug/L	SW846 8260B
Acetone	ND	20	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	97	(66 - 131)
Dibromofluoromethane	109	(69 - 135)
1,2-Dichloroethane-d4	105	(69 - 132)
4-Bromofluorobenzene	96	(66 - 119)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JAVW91AA **Matrix.....:** SOLID
MB Lot-Sample #: F6H080000-381
Leach Date.....: 08/08/06 **Prep Date.....:** 08/10/06 **Analysis Date..:** 08/10/06
Leach Batch #..: P622010 **Prep Batch #...:** 6225056 **Analysis Time..:** 14:14
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Carbon tetrachloride	ND	50	ug/L	SW846 8260B
Benzene	ND	50	ug/L	SW846 8260B
Chlorobenzene	ND	50	ug/L	SW846 8260B
Chloroform	ND	50	ug/L	SW846 8260B
1,1-Dichloroethene	ND	50	ug/L	SW846 8260B
Tetrachloroethylene	ND	50	ug/L	SW846 8260B
1,2-Dichloroethane	ND	50	ug/L	SW846 8260B
Trichloroethylene	ND	50	ug/L	SW846 8260B
Vinyl chloride	ND	100	ug/L	SW846 8260B
Methyl ethyl ketone (MEK)	ND	50	ug/L	SW846 8260B
1,4-Dichlorobenzene	ND	50	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(72 - 129)
Toluene-d8	104	(65 - 131)
4-Bromofluorobenzene	101	(62 - 128)
1,2-Dichloroethane-d4	106	(67 - 133)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F6H050196 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F6H080000-218 **Prep Batch #...:** 6220218						
Arsenic	ND	10	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AA
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Barium	ND	200	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AF
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Cadmium	ND	5	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AC
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Chromium	ND	10	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AD
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Lead	ND	10	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AG
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Selenium	ND	15	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AH
		Dilution Factor: 1				
		Analysis Time..: 14:18				
Silver	ND	10	ug/L	SW846 6010B	08/08-08/09/06	JAT5J1AE
		Dilution Factor: 1				
		Analysis Time..: 14:18				
MB Lot-Sample #: F6H150000-070 **Prep Batch #...:** 6227070						
Mercury	ND	0.2	ug/L	SW846 7470A	08/15/06	JCCAE1AA
		Dilution Factor: 1				
		Analysis Time..: 12:53				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TCLP Metals

Client Lot #...: F6H050196 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F6H100000-407 **Prep Batch #...:** 6223249						
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208						
Arsenic	ND	500	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AA
		Dilution Factor: 1				
		Analysis Time..: 12:37				
MB Lot-Sample #: F6H100000-407 **Prep Batch #...:** 6223306						
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208						
Mercury	ND	10	ug/L	SW846 7470A	08/11/06	JA3XC1AJ
		Dilution Factor: 1				
		Analysis Time..: 18:21				
MB Lot-Sample #: F6H100000-407 **Prep Batch #...:** 6223249						
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208						
Barium	ND	125	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AC
		Dilution Factor: 1				
		Analysis Time..: 12:37				
Chromium	ND	62.5	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AD
		Dilution Factor: 1				
		Analysis Time..: 12:37				
Lead	ND	250	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AE
		Dilution Factor: 1				
		Analysis Time..: 12:37				
Cadmium	ND	12.5	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AF
		Dilution Factor: 1				
		Analysis Time..: 12:37				
Selenium	ND	500	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AG
		Dilution Factor: 1				
		Analysis Time..: 12:37				
Silver	ND	25	ug/L	SW846 6010B	08/11-08/14/06	JA3XC1AH
		Dilution Factor: 1				
		Analysis Time..: 12:37				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: F6H150000-126 JCCDE1AD-LCSD
Prep Date.....: 08/11/06 **Analysis Date..:** 08/11/06
Prep Batch #...: 6227126 **Analysis Time..:** 13:13
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Dibromochloromethane	116	(73 - 131)			SW846 8260B
	110	(73 - 131)	5.6	(0-20)	SW846 8260B
Tetrachloroethene	98	(54 - 140)			SW846 8260B
	93	(54 - 140)	5.2	(0-20)	SW846 8260B
2-Hexanone	108	(48 - 145)			SW846 8260B
	99	(48 - 145)	9.0	(0-20)	SW846 8260B
1,2-Dibromoethane	111	(76 - 121)			SW846 8260B
	104	(76 - 121)	6.1	(0-20)	SW846 8260B
Chlorobenzene	100	(83 - 115)			SW846 8260B
	97	(83 - 115)	3.6	(0-20)	SW846 8260B
Ethylbenzene	105	(84 - 122)			SW846 8260B
	102	(84 - 122)	3.6	(0-20)	SW846 8260B
Styrene	102	(85 - 125)			SW846 8260B
	99	(85 - 125)	3.9	(0-20)	SW846 8260B
Bromoform	103	(71 - 141)			SW846 8260B
	103	(71 - 141)	0.38	(0-20)	SW846 8260B
Isopropylbenzene	101	(72 - 132)			SW846 8260B
	99	(72 - 132)	2.3	(0-20)	SW846 8260B
1,1,2,2-Tetrachloroethane	102	(66 - 126)			SW846 8260B
	99	(66 - 126)	3.5	(0-20)	SW846 8260B
1,3-Dichlorobenzene	102	(85 - 115)			SW846 8260B
	99	(85 - 115)	2.6	(0-20)	SW846 8260B
1,4-Dichlorobenzene	99	(83 - 115)			SW846 8260B
	97	(83 - 115)	1.8	(0-20)	SW846 8260B
1,2-Dichlorobenzene	102	(84 - 115)			SW846 8260B
	102	(84 - 115)	0.090	(0-20)	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	104	(60 - 136)			SW846 8260B
	101	(60 - 136)	3.6	(0-20)	SW846 8260B
1,2,4-Trichlorobenzene	103	(76 - 124)			SW846 8260B
	101	(76 - 124)	1.8	(0-20)	SW846 8260B
2-Butanone	112	(45 - 150)			SW846 8260B
	90 p	(45 - 150)	22	(0-20)	SW846 8260B
Chloroform	107	(84 - 115)			SW846 8260B
	105	(84 - 115)	1.7	(0-20)	SW846 8260B
1,1,1-Trichloroethane	102	(84 - 117)			SW846 8260B
	100	(84 - 117)	1.8	(0-20)	SW846 8260B

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: F6H150000-126 JCCDE1AD-LCSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
1,2-Dichloroethene (total)	109	(82 - 117)			SW846 8260B
	107	(82 - 117)	2.2	(0-20)	SW846 8260B
Cyclohexane	103	(77 - 127)			SW846 8260B
	102	(77 - 127)	1.3	(0-20)	SW846 8260B
Carbon tetrachloride	105	(82 - 125)			SW846 8260B
	103	(82 - 125)	2.3	(0-20)	SW846 8260B
Benzene	105	(85 - 115)			SW846 8260B
	104	(85 - 115)	1.0	(0-20)	SW846 8260B
1,2-Dichloroethane	109	(69 - 126)			SW846 8260B
	108	(69 - 126)	0.64	(0-20)	SW846 8260B
Trichloroethene	106	(77 - 117)			SW846 8260B
	103	(77 - 117)	2.5	(0-20)	SW846 8260B
Methylcyclohexane	108	(84 - 123)			SW846 8260B
	103	(84 - 123)	4.9	(0-20)	SW846 8260B
1,2-Dichloropropane	108	(78 - 118)			SW846 8260B
	105	(78 - 118)	2.6	(0-20)	SW846 8260B
Bromodichloromethane	113	(76 - 127)			SW846 8260B
	108	(76 - 127)	4.1	(0-20)	SW846 8260B
cis-1,3-Dichloropropene	110	(72 - 127)			SW846 8260B
	107	(72 - 127)	2.3	(0-20)	SW846 8260B
4-Methyl-2-pentanone	116	(51 - 150)			SW846 8260B
	113	(51 - 150)	1.8	(0-20)	SW846 8260B
Toluene	106	(82 - 121)			SW846 8260B
	102	(82 - 121)	3.7	(0-20)	SW846 8260B
trans-1,3-Dichloropropene	109	(71 - 130)			SW846 8260B
	106	(71 - 130)	2.9	(0-20)	SW846 8260B
1,1,2-Trichloroethane	107	(75 - 118)			SW846 8260B
	102	(75 - 118)	4.2	(0-20)	SW846 8260B
Trichlorofluoromethane	93	(72 - 131)			SW846 8260B
	90	(72 - 131)	3.6	(0-20)	SW846 8260B
1,1-Dichloroethene	105	(70 - 122)			SW846 8260B
	106	(70 - 122)	0.85	(0-20)	SW846 8260B
1,1,2-Trichloro-1,2,2-trif	105	(77 - 121)			SW846 8260B
	101	(77 - 121)	3.1	(0-20)	SW846 8260B
Carbon disulfide	141	(56 - 143)			SW846 8260B
	133	(56 - 143)	5.5	(0-20)	SW846 8260B
Methyl acetate	90	(30 - 145)			SW846 8260B
	100	(30 - 145)	11	(0-20)	SW846 8260B
m-Xylene & p-Xylene	105	(85 - 119)			SW846 8260B
	100	(85 - 119)	4.5	(0-20)	SW846 8260B

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: F6H150000-126 JCCDE1AD-LCSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Methylene chloride	143 a	(64 - 141)			SW846 8260B
	129	(64 - 141)	10	(0-20)	SW846 8260B
o-Xylene	108	(83 - 120)			SW846 8260B
	104	(83 - 120)	4.0	(0-20)	SW846 8260B
trans-1,2-Dichloroethene	107	(80 - 118)			SW846 8260B
	106	(80 - 118)	1.1	(0-20)	SW846 8260B
Methyl tert-butyl ether (MTBE)	108	(58 - 137)			SW846 8260B
	100	(58 - 137)	7.0	(0-20)	SW846 8260B
1,1-Dichloroethane	110	(85 - 117)			SW846 8260B
	108	(85 - 117)	1.7	(0-20)	SW846 8260B
cis-1,2-Dichloroethene	111	(84 - 117)			SW846 8260B
	108	(84 - 117)	3.3	(0-20)	SW846 8260B
Dichlorodifluoromethane (Freon 12)	61	(51 - 149)			SW846 8260B
	59	(51 - 149)	3.2	(0-20)	SW846 8260B
Chloromethane	83	(62 - 129)			SW846 8260B
	81	(62 - 129)	2.8	(0-20)	SW846 8260B
Vinyl chloride	89	(71 - 131)			SW846 8260B
	86	(71 - 131)	3.2	(0-20)	SW846 8260B
Bromomethane	99	(58 - 150)			SW846 8260B
	93	(58 - 150)	6.1	(0-20)	SW846 8260B
Chloroethane	100	(64 - 136)			SW846 8260B
	93	(64 - 136)	7.4	(0-20)	SW846 8260B
Acetone	92	(50 - 150)			SW846 8260B
	93	(50 - 150)	0.76	(0-20)	SW846 8260B
Bromobenzene	101	(85 - 115)			SW846 8260B
	100	(85 - 115)	1.3	(0-20)	SW846 8260B
Bromochloromethane	111	(75 - 123)			SW846 8260B
	102	(75 - 123)	8.4	(0-20)	SW846 8260B
n-Butylbenzene	99	(79 - 130)			SW846 8260B
	96	(79 - 130)	3.0	(0-20)	SW846 8260B
sec-Butylbenzene	100	(77 - 129)			SW846 8260B
	98	(77 - 129)	2.2	(0-20)	SW846 8260B
tert-Butylbenzene	100	(76 - 128)			SW846 8260B
	98	(76 - 128)	2.2	(0-20)	SW846 8260B
Allyl chloride	113	(56 - 142)			SW846 8260B
	107	(56 - 142)	5.6	(0-20)	SW846 8260B
2-Chlorotoluene	100	(76 - 123)			SW846 8260B
	98	(76 - 123)	1.8	(0-20)	SW846 8260B

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: F6H150000-126 JCCDE1AD-LCSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
4-Chlorotoluene	100	(80 - 120)			SW846 8260B
	98	(80 - 120)	2.3	(0-20)	SW846 8260B
Cyclohexanone	46	(30 - 150)			SW846 8260B
	37 p	(30 - 150)	22	(0-20)	SW846 8260B
trans-1,4-Dichloro-2-butene	136	(43 - 150)			SW846 8260B
	133	(43 - 150)	2.5	(0-20)	SW846 8260B
1,3-Dichloropropane	110	(76 - 117)			SW846 8260B
	104	(76 - 117)	4.8	(0-20)	SW846 8260B
2,2-Dichloropropane	108	(72 - 130)			SW846 8260B
	105	(72 - 130)	3.3	(0-20)	SW846 8260B
1,1-Dichloropropene	104	(81 - 115)			SW846 8260B
	102	(81 - 115)	1.6	(0-20)	SW846 8260B
Ethyl methacrylate	93	(56 - 136)			SW846 8260B
	90	(56 - 136)	2.9	(0-20)	SW846 8260B
Hexachlorobutadiene	97	(75 - 126)			SW846 8260B
	94	(75 - 126)	3.8	(0-20)	SW846 8260B
n-Hexane	113	(66 - 138)			SW846 8260B
	109	(66 - 138)	3.7	(0-20)	SW846 8260B
4-Isopropyltoluene	100	(84 - 129)			SW846 8260B
	98	(84 - 129)	2.0	(0-20)	SW846 8260B
Methyl methacrylate	105	(47 - 139)			SW846 8260B
	95	(47 - 139)	10	(0-20)	SW846 8260B
Naphthalene	102	(47 - 150)			SW846 8260B
	98	(47 - 150)	3.4	(0-20)	SW846 8260B
2-Nitropropane	104	(56 - 146)			SW846 8260B
	95	(56 - 146)	9.2	(0-20)	SW846 8260B
n-Propylbenzene	101	(76 - 130)			SW846 8260B
	98	(76 - 130)	2.6	(0-20)	SW846 8260B
1,1,1,2-Tetrachloroethane	104	(81 - 117)			SW846 8260B
	99	(81 - 117)	4.8	(0-20)	SW846 8260B
Tetrahydrofuran	108	(53 - 132)			SW846 8260B
	104	(53 - 132)	3.4	(0-20)	SW846 8260B
1,2,3-Trichlorobenzene	101	(72 - 129)			SW846 8260B
	99	(72 - 129)	1.4	(0-20)	SW846 8260B
1,3,5-Trimethylbenzene	100	(83 - 126)			SW846 8260B
	98	(83 - 126)	1.5	(0-20)	SW846 8260B
Ethyl ether	111	(61 - 130)			SW846 8260B
	109	(61 - 130)	2.0	(0-20)	SW846 8260B
1-Butanol	93	(40 - 150)			SW846 8260B
	77	(40 - 150)	19	(0-20)	SW846 8260B

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JCCDE1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: F6H150000-126 JCCDE1AD-LCSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Acetonitrile	**110**	**(64 - 131)**			**SW846 8260B**
	89 p	**(64 - 131)**	**21**	**(0-20)**	**SW846 8260B**
Ethyl acetate	**115**	**(60 - 150)**			**SW846 8260B**
	120	**(60 - 150)**	**4.4**	**(0-20)**	**SW846 8260B**
Iodomethane	**117**	**(55 - 167)**			**SW846 8260B**
	112	**(55 - 167)**	**4.4**	**(0-20)**	**SW846 8260B**
Vinyl acetate	**118**	**(50 - 155)**			**SW846 8260B**
	124	**(50 - 155)**	**5.4**	**(0-20)**	**SW846 8260B**
Acrolein	**180 a**	**(30 - 144)**			**SW846 8260B**
	179 a	**(30 - 144)**	**1.0**	**(0-20)**	**SW846 8260B**
Acrylonitrile	**131**	**(30 - 150)**			**SW846 8260B**
	122	**(30 - 150)**	**7.2**	**(0-20)**	**SW846 8260B**
Isobutanol	**95**	**(37 - 139)**			**SW846 8260B**
	88	**(37 - 139)**	**6.8**	**(0-20)**	**SW846 8260B**
Methacrylonitrile	**113**	**(64 - 142)**			**SW846 8260B**
	107	**(64 - 142)**	**5.8**	**(0-20)**	**SW846 8260B**
Propionitrile	**112**	**(58 - 139)**			**SW846 8260B**
	111	**(58 - 139)**	**0.71**	**(0-20)**	**SW846 8260B**
1,4-Dioxane	**99**	**(44 - 136)**			**SW846 8260B**
	77 p	**(44 - 136)**	**25**	**(0-20)**	**SW846 8260B**
Pentachloroethane	**116**	**(72 - 157)**			**SW846 8260B**
	111	**(72 - 157)**	**4.3**	**(0-20)**	**SW846 8260B**
2-Chloro-1,3-butadiene	**109**	**(85 - 131)**			**SW846 8260B**
	107	**(85 - 131)**	**1.8**	**(0-20)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	108	(85 - 117)
	101	(85 - 117)
Dibromofluoromethane	108	(82 - 121)
	103	(82 - 121)
1,2-Dichloroethane-d4	115	(74 - 126)
	99	(74 - 126)
4-Bromofluorobenzene	96	(76 - 117)
	93	(76 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

p Relative percent difference (RPD) is outside stated control limits.

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JA9PW1AA **Matrix.....:** SOLID
LCS Lot-Sample#: F6H130000-056
Prep Date.....: 08/10/06 **Analysis Date..:** 08/10/06
Prep Batch #...: 6225056 **Analysis Time..:** 13:25
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Carbon tetrachloride	**109**	**(68 - 134)**	**SW846 8260B**
Benzene	**107**	**(73 - 123)**	**SW846 8260B**
Chlorobenzene	**101**	**(75 - 124)**	**SW846 8260B**
Chloroform	**106**	**(77 - 122)**	**SW846 8260B**
1,1-Dichloroethene	**106**	**(67 - 130)**	**SW846 8260B**
Tetrachloroethylene	**100**	**(63 - 125)**	**SW846 8260B**
1,2-Dichloroethane	**97**	**(68 - 124)**	**SW846 8260B**
Trichloroethylene	**111**	**(66 - 123)**	**SW846 8260B**
Vinyl chloride	**101**	**(63 - 123)**	**SW846 8260B**
Methyl ethyl ketone (MEK)	**73**	**(67 - 122)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(81 - 121)
Toluene-d8	102	(79 - 123)
4-Bromofluorobenzene	98	(68 - 123)
1,2-Dichloroethane-d4	96	(74 - 122)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: F6H050196 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F6H080000-218 **Prep Batch #...:** 6220218					
Arsenic	107	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AK
		Dilution Factor: 1	Analysis Time..: 14:13		
Cadmium	102	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AL
		Dilution Factor: 1	Analysis Time..: 14:13		
Chromium	100	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AM
		Dilution Factor: 1	Analysis Time..: 14:13		
Silver	102	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AN
		Dilution Factor: 1	Analysis Time..: 14:13		
Barium	101	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AP
		Dilution Factor: 1	Analysis Time..: 14:13		
Lead	99	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AQ
		Dilution Factor: 1	Analysis Time..: 14:13		
Selenium	106	(80 - 120)	SW846 6010B	08/08-08/09/06	JAT5J1AR
		Dilution Factor: 1	Analysis Time..: 14:13		
LCS Lot-Sample#: F6H150000-070 **Prep Batch #...:** 6227070					
Mercury	97	(85 - 115)	SW846 7470A	08/15/06	JCCAE1AC
		Dilution Factor: 1	Analysis Time..: 12:55		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #...: F6H050196 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F6H110000-249 **Prep Batch #...:** 6223249					
Arsenic	101	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AC
		Dilution Factor: 1	Analysis Time..: 12:42		
Barium	99	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AD
		Dilution Factor: 1	Analysis Time..: 12:42		
Chromium	95	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AG
		Dilution Factor: 1	Analysis Time..: 12:42		
Lead	92	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AJ
		Dilution Factor: 1	Analysis Time..: 12:42		
Cadmium	96	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AF
		Dilution Factor: 1	Analysis Time..: 12:42		
Selenium	98	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AL
		Dilution Factor: 1	Analysis Time..: 12:42		
Silver	98	(80 - 120)	SW846 6010B	08/11-08/14/06	JA53D1AA
		Dilution Factor: 1	Analysis Time..: 12:42		
LCS Lot-Sample#: F6H110000-306 **Prep Batch #...:** 6223306					
Mercury	110	(85 - 115)	SW846 7470A	08/11/06	JA6AR1AA
		Dilution Factor: 1	Analysis Time..: 18:23		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP GC/MS Volatiles

Client Lot #...: F6H050196 **Work Order #...:** JAQL91A6-MS **Matrix.....:** SOLID
MS Lot-Sample #: F6H050196-014 JAQL91A7-MSD
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06
Leach Date.....: 08/08/06 **Prep Date.....:** 08/10/06 **Analysis Date..:** 08/10/06
Leach Batch #..: P622010 **Prep Batch #...:** 6225056 **Analysis Time..:** 15:03
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Carbon tetrachloride	**115**	**(70 - 136)**			**SW846 8260B**
	111	**(70 - 136)**	**4.1**	**(0-20)**	**SW846 8260B**
Benzene	**110**	**(77 - 124)**			**SW846 8260B**
	109	**(77 - 124)**	**0.82**	**(0-20)**	**SW846 8260B**
Chlorobenzene	**105**	**(76 - 124)**			**SW846 8260B**
	103	**(76 - 124)**	**1.6**	**(0-20)**	**SW846 8260B**
Chloroform	**114**	**(76 - 129)**			**SW846 8260B**
	110	**(76 - 129)**	**3.0**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**108**	**(60 - 139)**			**SW846 8260B**
	105	**(60 - 139)**	**3.0**	**(0-20)**	**SW846 8260B**
Tetrachloroethylene	**102**	**(58 - 132)**			**SW846 8260B**
	100	**(58 - 132)**	**2.3**	**(0-20)**	**SW846 8260B**
1,2-Dichloroethane	**112**	**(69 - 130)**			**SW846 8260B**
	104	**(69 - 130)**	**8.0**	**(0-20)**	**SW846 8260B**
Trichloroethylene	**113**	**(67 - 126)**			**SW846 8260B**
	104	**(67 - 126)**	**5.8**	**(0-20)**	**SW846 8260B**
Vinyl chloride	**104**	**(52 - 138)**			**SW846 8260B**
	100	**(52 - 138)**	**3.7**	**(0-20)**	**SW846 8260B**
Methyl ethyl ketone (MEK)	**97**	**(51 - 150)**			**SW846 8260B**
	83	**(51 - 150)**	**16**	**(0-20)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(72 - 129)
	110	(72 - 129)
Toluene-d8	105	(65 - 131)
	108	(65 - 131)
4-Bromofluorobenzene	101	(62 - 128)
	106	(62 - 128)
1,2-Dichloroethane-d4	114	(67 - 133)
	107	(67 - 133)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: F6H050196 **Matrix.....:** WATER
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F6H050196-013 **Prep Batch #...:** 6220218							
Arsenic	104	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81AM
	101	(75 - 125)	2.8	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81AN
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Barium	104	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81AW
	100	(75 - 125)	3.0	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81AX
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Cadmium	95	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81AP
	93	(75 - 125)	2.1	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81AQ
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Chromium	91	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81AR
	83	(75 - 125)	1.8	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81AT
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Lead	94	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81A0
	89	(75 - 125)	2.2	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81A1
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Selenium	101	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81A2
	98	(75 - 125)	2.4	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81A3
		Dilution Factor: 1					
		Analysis Time..: 14:04					
Silver	110	(75 - 125)			SW846 6010B	08/08-08/09/06	JAQL81AU
	96	(75 - 125)	2.1	(0-20)	SW846 6010B	08/08-08/09/06	JAQL81AV
		Dilution Factor: 1					
		Analysis Time..: 14:04					
MS Lot-Sample #: F6H050196-013 **Prep Batch #...:** 6227070							
Mercury	69 N	(70 - 130)			SW846 7470A	08/15/06	JAQL81A4
	80	(70 - 130)	12	(0-20)	SW846 7470A	08/15/06	JAQL81A5
		Dilution Factor: 1					
		Analysis Time..: 12:59					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #...: F6H050196 **Matrix.....:** SOLID
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F6H050196-014 **Prep Batch #...:** 6223249							
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208							
Arsenic	105	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91AM
	104	(75 - 125)	1.1	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91AN
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Barium	104	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91AP
	102	(75 - 125)	1.9	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91AQ
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Chromium	100	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91AR
	99	(75 - 125)	0.98	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91AT
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Lead	97	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91AU
	96	(75 - 125)	1.2	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91AV
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Cadmium	104	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91AW
	101	(75 - 125)	3.0	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91AX
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Selenium	102	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91A0
	101	(75 - 125)	1.5	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91A1
		Dilution Factor: 1					
		Analysis Time..: 13:22					
Silver	102	(75 - 125)			SW846 6010B	08/11-08/14/06	JAQL91A2
	97	(75 - 125)	5.3	(0-20)	SW846 6010B	08/11-08/14/06	JAQL91A3
		Dilution Factor: 1					
		Analysis Time..: 13:22					

MS Lot-Sample #: F6H050196-014 **Prep Batch #...:** 6223306
Leach Date.....: 08/10/06 **Leach Batch #..:** P622208

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #...: F6H050196 **Matrix.....:** SOLID
Date Sampled...: 08/03/06 20:00 **Date Received..:** 08/05/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Mercury	99	(70 - 130)			SW846 7470A	08/11/06	JAQL91A4
	94	(70 - 130)	5.0	(0-20)	SW846 7470A	08/11/06	JAQL91A5

Dilution Factor: 1
Analysis Time..: 18:41

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Earth Tech, Inc.

Client Sample ID: HA030002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-001
Work Order: JAOLT
Matrix: SOLID

Date Collected: 08/01/06 1815
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 88**
Uranium 234	1.65		0.33	0.10	0.02	08/10/06	08/14/06
Uranium 235/236	0.081	J	0.062	0.100	0.027	08/10/06	08/14/06
Uranium 238	1.68		0.33	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 84**
Thorium 228	0.75		0.19	0.10	0.08	08/10/06	08/14/06
Thorium 230	2.00		0.38	0.10	0.04	08/10/06	08/14/06
Thorium 232	0.76		0.19	0.10	0.04	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: HA040002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-002
Work Order: JAOLV
Matrix: SOLID

Date Collected: 08/01/06 1830
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 90**
Uranium 234	1.19		0.26	0.10	0.02	08/10/06	08/14/06
Uranium 235/236	0.030	J	0.041	0.100	0.027	08/10/06	08/14/06
Uranium 238	1.28		0.27	0.10	0.02	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 87**
Thorium 228	0.78		0.20	0.10	0.08	08/10/06	08/14/06
Thorium 230	1.73		0.34	0.10	0.02	08/10/06	08/14/06
Thorium 232	0.66		0.18	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: HA050002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-003
Work Order: JAOLW
Matrix: SOLID

Date Collected: 08/01/06 1911
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 80**
Uranium 234	1.51		0.32	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.087	J	0.066	0.100	0.029	08/10/06	08/14/06
Uranium 238	1.92		0.38	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 81**
Thorium 228	1.19		0.27	0.10	0.08	08/10/06	08/14/06
Thorium 230	2.43		0.45	0.10	0.05	08/10/06	08/14/06
Thorium 232	1.30		0.28	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP110405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-004
Work Order: JAQLX
Matrix: SOLID

Date Collected: 08/02/06 1010
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 94**
Uranium 234	1.63		0.32	0.10	0.03	08/10/06	08/14/06
Uranium 235/236	0.067	J	0.055	0.100	0.026	08/10/06	08/14/06
Uranium 238	1.57		0.31	0.10	0.03	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 92**
Thorium 228	0.88		0.21	0.10	0.08	08/10/06	08/14/06
Thorium 230	2.16		0.39	0.10	0.05	08/10/06	08/14/06
Thorium 232	1.01		0.22	0.10	0.02	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP130506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-005
Work Order: JAQL0
Matrix: SOLID

Date Collected: 08/02/06 1145
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 76**
Uranium 234	**1.71**		**0.35**	0.10	**0.05**	**08/10/06**	**08/14/06**
Uranium 235/236	0.025	U	0.043	0.100	0.066	08/10/06	08/14/06
Uranium 238	**1.69**		**0.35**	0.10	**0.04**	**08/10/06**	**08/14/06**
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 93**
Thorium 228	**0.88**		**0.21**	0.10	**0.07**	**08/10/06**	**08/14/06**
Thorium 230	**1.73**		**0.33**	0.10	**0.05**	**08/10/06**	**08/14/06**
Thorium 232	**0.91**		**0.21**	0.10	**0.05**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

Earth Tech, Inc.

Client Sample ID: GP150304

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-006
Work Order: JAOL1
Matrix: SOLID

Date Collected: 08/02/06 1400
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 79**
Uranium 234	1.88		0.37	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.139		0.083	0.100	0.029	08/10/06	08/14/06
Uranium 238	1.88		0.37	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 80**
Thorium 228	0.76		0.20	0.10	0.07	08/10/06	08/14/06
Thorium 230	1.89		0.37	0.10	0.05	08/10/06	08/14/06
Thorium 232	0.78		0.20	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP160809

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-007
Work Order: JAOL2
Matrix: SOLID

Date Collected: 08/02/06 1634
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 88**
Uranium 234	1.29		0.27	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.080	J	0.061	0.100	0.027	08/10/06	08/14/06
Uranium 238	1.43		0.29	0.10	0.02	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 84**
Thorium 228	0.80		0.20	0.10	0.08	08/10/06	08/14/06
Thorium 230	1.99		0.38	0.10	0.05	08/10/06	08/14/06
Thorium 232	1.01		0.23	0.10	0.04	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP160809 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-007X
Work Order: JAOL2
Matrix: SOLID

Date Collected: 08/02/06 1634
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 77**
Uranium 234	**1.40**		**0.30**	0.10	**0.04**	**08/10/06**	**08/14/06**
Uranium 235/236	0.011	U	0.031	0.100	0.029	08/10/06	08/14/06
Uranium 238	**1.27**		**0.28**	0.10	**0.02**	**08/10/06**	**08/14/06**
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 89**
Thorium 228	**0.98**		**0.23**	0.10	**0.07**	**08/10/06**	**08/14/06**
Thorium 230	**2.10**		**0.39**	0.10	**0.05**	**08/10/06**	**08/14/06**
Thorium 232	**0.80**		**0.20**	0.10	**0.05**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

Earth Tech, Inc.

Client Sample ID: GP170405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-008
Work Order: JAOL3
Matrix: SOLID

Date Collected: 08/02/06 1725
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 70**
Uranium 234	1.41		0.31	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.168		0.095	0.100	0.055	08/10/06	08/14/06
Uranium 238	1.84		0.38	0.10	0.05	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 87**
Thorium 228	0.62		0.17	0.10	0.09	08/10/06	08/14/06
Thorium 230	1.55		0.31	0.10	0.02	08/10/06	08/14/06
Thorium 232	0.75		0.19	0.10	0.02	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP180304

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-009
Work Order: JAQL4
Matrix: SOLID

Date Collected: 08/02/06 1800
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g	Batch # 6222120		Yld % 78
Uranium 234	1.86		0.40	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.066	J	0.066	0.100	0.036	08/10/06	08/14/06
Uranium 238	1.89		0.40	0.10	0.03	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP180304 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-009X
Work Order: JAQL4
Matrix: SOLID

Date Collected: 08/02/06 1800
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 79**
Uranium 234	1.97		0.42	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.096	J	0.079	0.100	0.037	08/10/06	08/14/06
Uranium 238	1.95		0.42	0.10	0.06	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP190304

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-010
Work Order: JAQL5
Matrix: SOLID

Date Collected: 08/02/06 1840
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 6222120	Yld % 72
Uranium 234	1.27		0.31	0.10	0.07	08/10/06	08/14/06
Uranium 235/236	0.072	J	0.071	0.100	0.039	08/10/06	08/14/06
Uranium 238	1.31		0.32	0.10	0.06	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP210405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-011
Work Order: JAOL6
Matrix: SOLID

Date Collected: 08/03/06 1233
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 79**
Uranium 234	3.63		0.68	0.10	0.07	08/10/06	08/14/06
Uranium 235/236	0.170		0.0997	0.100	0.058	08/10/06	08/14/06
Uranium 238	3.92		0.72	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP220405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-012
Work Order: JAQL7
Matrix: SOLID

Date Collected: 08/03/06 1330
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 6222120	Yld % 81
Uranium 234	2.23		0.45	0.10	0.06	08/10/06	08/14/06
Uranium 235/236	0.140		0.089	0.100	0.056	08/10/06	08/14/06
Uranium 238	2.17		0.44	0.10	0.03	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP230506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-015
Work Order: JAQMA
Matrix: SOLID

Date Collected: 08/03/06 1420
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 73**
Uranium 234	**1.44**		**0.34**	0.10	**0.06**	**08/10/06**	**08/14/06**
Uranium 235/236	0.036	U	0.052	0.100	0.071	08/10/06	08/14/06
Uranium 238	**1.42**		**0.33**	0.10	**0.06**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

Earth Tech, Inc.

Client Sample ID: GP240506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-016
Work Order: JAOME
Matrix: SOLID

Date Collected: 08/03/06 1510
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 69**
Uranium 234	1.97		0.43	0.10	0.06	08/10/06	08/14/06
Uranium 235/236	0.113		0.088	0.100	0.075	08/10/06	08/14/06
Uranium 238	2.48		0.52	0.10	0.07	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP250405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-017
Work Order: JAOMH
Matrix: SOLID

Date Collected: 08/03/06 1740
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 76**
Uranium 234	2.53		0.47	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.120		0.077	0.100	0.029	08/10/06	08/14/06
Uranium 238	2.37		0.45	0.10	0.05	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 67**
Thorium 228	0.98		0.26	0.10	0.10	08/10/06	08/14/06
Thorium 230	2.53		0.50	0.10	0.05	08/10/06	08/14/06
Thorium 232	1.42		0.32	0.10	0.03	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP260405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-018
Work Order: JAOMK
Matrix: SOLID

Date Collected: 08/03/06 1830
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 70**
Uranium 234	2.06		0.45	0.10	0.03	08/10/06	08/14/06
Uranium 235/236	0.136		0.098	0.100	0.041	08/10/06	08/14/06
Uranium 238	2.64		0.55	0.10	0.07	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP270405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-019
Work Order: JAQML
Matrix: SOLID

Date Collected: 08/03/06 1910
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 82**
Uranium 234	1.99		0.38	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.104		0.071	0.100	0.028	08/10/06	08/14/06
Uranium 238	1.94		0.37	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6230453**	**Yld % 88**
Thorium 228	0.84		0.23	0.20	0.09	08/18/06	08/19/06
Thorium 230	1.78		0.38	0.20	0.05	08/18/06	08/19/06
Thorium 232	0.76		0.21	0.20	0.05	08/18/06	08/19/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP540102

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-020
Work Order: JAOMN
Matrix: SOLID

Date Collected: 08/01/06 0900
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 87**
Uranium 234	14.7		2.3	0.1	0.06	08/10/06	08/14/06
Uranium 235/236	0.66		0.21	0.10	0.03	08/10/06	08/14/06
Uranium 238	16.8		2.6	0.1	0.04	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP590405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-021
Work Order: JAQMR
Matrix: SOLID

Date Collected: 08/01/06 0830
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 78**
Uranium 234	1.02		0.24	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.056	J	0.056	0.100	0.030	08/10/06	08/14/06
Uranium 238	1.35		0.29	0.10	0.05	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 76**
Thorium 228	0.77		0.21	0.10	0.08	08/10/06	08/14/06
Thorium 230	1.79		0.36	0.10	0.05	08/10/06	08/14/06
Thorium 232	0.66		0.18	0.10	0.02	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP670405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-022
Work Order: JAOMT
Matrix: SOLID

Date Collected: 08/02/06 0725
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 84**
Uranium 234	1.61		0.32	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.088	J	0.065	0.100	0.055	08/10/06	08/14/06
Uranium 238	1.92		0.37	0.10	0.02	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 88**
Thorium 228	0.77		0.19	0.10	0.07	08/10/06	08/14/06
Thorium 230	1.67		0.33	0.10	0.05	08/10/06	08/14/06
Thorium 232	0.85		0.20	0.10	0.04	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP710405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-023
Work Order: JAOMW
Matrix: SOLID

Date Collected: 08/03/06 1000
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 69**
Uranium 234	**2.67**		**0.55**	0.10	**0.05**	**08/10/06**	**08/14/06**
Uranium 235/236	**0.148**		**0.099**	0.100	**0.066**	**08/10/06**	**08/14/06**
Uranium 238	**2.97**		**0.60**	0.10	**0.06**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP730506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-024
Work Order: JAOM0
Matrix: SOLID

Date Collected: 08/03/06 0930
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 89**
Uranium 234	**1.33**		**0.30**	0.10	**0.06**	08/10/06	08/14/06
Uranium 235/236	**0.142**		**0.088**	0.100	**0.032**	08/10/06	08/14/06
Uranium 238	**1.17**		**0.27**	0.10	**0.05**	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP770506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-025
Work Order: JAQM3
Matrix: SOLID

Date Collected: 08/03/06 1910
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 83**
Uranium 234	2.02		0.39	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.088	J	0.067	0.100	0.030	08/10/06	08/14/06
Uranium 238	1.82		0.36	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 89**
Thorium 228	0.76		0.19	0.10	0.08	08/10/06	08/14/06
Thorium 230	1.74		0.33	0.10	0.06	08/10/06	08/14/06
Thorium 232	0.90		0.20	0.10	0.04	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP010001

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-026
Work Order: JAOM7
Matrix: SOLID

Date Collected: 08/01/06 1026
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 80**
Thorium 228	0.44		0.15	0.10	0.08	08/10/06	08/14/06
Thorium 230	2.35		0.44	0.10	0.05	08/10/06	08/14/06
Thorium 232	0.62		0.17	0.10	0.02	08/10/06	08/14/06
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6228096**	**Yld % 99**
Uranium 234	1720		270	20	5	08/16/06	08/18/06
Uranium 235/236	71		23	25	4	08/16/06	08/18/06
Uranium 238	1780		280	20	3	08/16/06	08/18/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP010001 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-026X
Work Order: JAOM7
Matrix: SOLID

Date Collected: 08/01/06 1026
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 6222115	Yld % 81
Thorium 228	0.57		0.17	0.10	0.08	08/10/06	08/14/06
Thorium 230	1.93		0.37	0.10	0.06	08/10/06	08/14/06
Thorium 232	0.58		0.16	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP020506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-027
Work Order: JAONC
Matrix: SOLID

Date Collected: 08/01/06 1115
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 85**
Uranium 234	1.67		0.33	0.10	0.04	08/10/06	08/14/06
Uranium 235/236	0.090	J	0.064	0.100	0.027	08/10/06	08/14/06
Uranium 238	1.58		0.32	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 84**
Thorium 228	1.00		0.24	0.10	0.09	08/10/06	08/14/06
Thorium 230	2.17		0.41	0.10	0.05	08/10/06	08/14/06
Thorium 232	1.01		0.23	0.10	0.05	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: GP030001

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-028
Work Order: JAOND
Matrix: SOLID

Date Collected: 08/01/06 1150
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 6228096	Yld % 101
Uranium 234	84		14	3	0.6	08/16/06	08/18/06
Uranium 235/236	4.8		2.0	3.0	0.5	08/16/06	08/18/06
Uranium 238	83		14	3	0.7	08/16/06	08/18/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP030001 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-028X
Work Order: JAQND
Matrix: SOLID

Date Collected: 08/01/06 1150
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD			pCi/g		Batch # 6228096		Yld % 92
Uranium 234	86		15	3	0.9	08/16/06	08/18/06
Uranium 235/236	4.1		1.9	3.0	0.5	08/16/06	08/18/06
Uranium 238	93		16	3	0.7	08/16/06	08/18/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP040102

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-029
Work Order: JAONE
Matrix: SOLID

Date Collected: 08/01/06 1225
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6228096**	**Yld % 102**
Uranium 234	**12.9**		**3.3**	3.0	**0.8**	**08/16/06**	**08/18/06**
Uranium 235/236	0.31	U	0.51	3.00	0.73	08/16/06	08/18/06
Uranium 238	**12.0**		**3.1**	3.0	**0.7**	**08/16/06**	**08/18/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

Earth Tech, Inc.

Client Sample ID: GP050405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-030
Work Order: JAONF
Matrix: SOLID

Date Collected: 08/01/06 1400
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 79**
Uranium 234	2.35		0.45	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.113		0.076	0.100	0.030	08/10/06	08/14/06
Uranium 238	2.48		0.47	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 79**
Thorium 228	1.16		0.26	0.10	0.08	08/10/06	08/15/06
Thorium 230	2.06		0.40	0.10	0.05	08/10/06	08/15/06
Thorium 232	1.11		0.25	0.10	0.04	08/10/06	08/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP060405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-031
Work Order: JAONG
Matrix: SOLID

Date Collected: 08/01/06 1440
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD			pCi/g		Batch # 6222120		Yld % 67
Uranium 234	2.08		0.47	0.10	0.08	08/10/06	08/14/06
Uranium 235/236	0.120		0.094	0.100	0.080	08/10/06	08/14/06
Uranium 238	2.37		0.51	0.10	0.06	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP070506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-032
Work Order: JAONH
Matrix: SOLID

Date Collected: 08/01/06 1510
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 77**
Uranium 234	**1.66**		**0.36**	0.10	**0.07**	**08/10/06**	**08/14/06**
Uranium 235/236	0.042	U	0.055	0.100	0.070	08/10/06	08/14/06
Uranium 238	**1.76**		**0.37**	0.10	**0.06**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Result is less than the sample detection limit.

Earth Tech, Inc.

Client Sample ID: GP080405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-033
Work Order: JAQNK
Matrix: SOLID

Date Collected: 08/01/06 1545
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 83**
Uranium 234	1.79		0.38	0.10	0.06	08/10/06	08/14/06
Uranium 235/236	0.101		0.078	0.100	0.034	08/10/06	08/14/06
Uranium 238	1.51		0.34	0.10	0.06	08/10/06	08/14/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP090405

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-034
Work Order: JAONM
Matrix: SOLID

Date Collected: 08/01/06 1615
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 74**
Uranium 234	1.44		0.31	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.125		0.081	0.100	0.031	08/10/06	08/14/06
Uranium 238	1.46		0.31	0.10	0.02	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 81**
Thorium 228	0.81		0.21	0.10	0.08	08/10/06	08/15/06
Thorium 230	1.85		0.37	0.10	0.02	08/10/06	08/15/06
Thorium 232	0.76		0.20	0.10	0.04	08/10/06	08/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP100708

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-035
Work Order: JAONN
Matrix: SOLID

Date Collected: 08/01/06 1708
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222120**	**Yld % 74**
Uranium 234	**1.41**		**0.34**	0.10	**0.05**	**08/10/06**	**08/14/06**
Uranium 235/236	**0.121**		**0.092**	0.100	**0.041**	**08/10/06**	**08/14/06**
Uranium 238	**1.82**		**0.41**	0.10	**0.07**	**08/10/06**	**08/14/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: HA010002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-036
Work Order: JAONO
Matrix: SOLID

Date Collected: 08/01/06 0000
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 88**
Uranium 234	1.44		0.29	0.10	0.05	08/10/06	08/14/06
Uranium 235/236	0.059	J	0.053	0.100	0.027	08/10/06	08/14/06
Uranium 238	1.29		0.27	0.10	0.04	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 76**
Thorium 228	1.03		0.24	0.10	0.07	08/10/06	08/15/06
Thorium 230	1.68		0.34	0.10	0.04	08/10/06	08/15/06
Thorium 232	0.78		0.20	0.10	0.05	08/10/06	08/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Earth Tech, Inc.

Client Sample ID: HA020002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H050196-037
Work Order: JAONR
Matrix: SOLID

Date Collected: 08/01/06 0000
Date Received: 08/05/06 0815

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222119**	**Yld % 77**
Uranium 234	1.16		0.26	0.10	0.02	08/10/06	08/14/06
Uranium 235/236	0.053	J	0.052	0.100	0.051	08/10/06	08/14/06
Uranium 238	1.09		0.25	0.10	0.05	08/10/06	08/14/06
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6222115**	**Yld % 74**
Thorium 228	0.64		0.18	0.10	0.09	08/10/06	08/15/06
Thorium 230	1.57		0.33	0.10	0.07	08/10/06	08/15/06
Thorium 232	0.65		0.18	0.10	0.06	08/10/06	08/15/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H050196
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC		Prep Date	Lab Sample ID / Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch #**	**6222115**	**Yld %**	**95**	**F6H100000-115B**
Thorium 228	0.0	U	0.0	0.1	0.06		08/10/06	08/15/06
Thorium 230	**0.069**	**J**	**0.048**	0.100	**0.038**		**08/10/06**	**08/15/06**
Thorium 232	0.007	U	0.020	0.100	0.019		08/10/06	08/15/06
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch #**	**6222119**	**Yld %**	**92**	**F6H100000-119B**
Uranium 234	0.019	U	0.029	0.100	0.041		08/10/06	08/14/06
Uranium 235/236	0.019	U	0.033	0.100	0.026		08/10/06	08/14/06
Uranium 238	0.012	U	0.024	0.100	0.041		08/10/06	08/14/06
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch #**	**6222120**	**Yld %**	**84**	**F6H100000-120B**
Uranium 234	0.032	U	0.050	0.100	0.071		08/10/06	08/14/06
Uranium 235/236	-0.003	U	0.027	0.100	0.053		08/10/06	08/14/06
Uranium 238	0.011	U	0.033	0.100	0.058		08/10/06	08/14/06
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch #**	**6228096**	**Yld %**	**98**	**F6H160000-096B**
Uranium 234	**0.063**	**J**	**0.038**	0.100	**0.028**		**08/16/06**	**08/18/06**
Uranium 235/236	0.005	U	0.013	0.100	0.025		08/16/06	08/18/06
Uranium 238	**0.028**	**J**	**0.025**	0.100	**0.013**		**08/16/06**	**08/18/06**
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch #**	**6230453**	**Yld %**	**99**	**F6H180000-453B**
Thorium 228	0.015	U	0.029	0.100	0.042		08/18/06	08/19/06
Thorium 230	**0.049**	**J**	**0.033**	0.100	**0.013**		**08/18/06**	**08/19/06**
Thorium 232	-0.003	U	0.012	0.100	0.026		08/18/06	08/19/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H050196
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID / QC Control Limits
Iso THORIUM (LONG CT) DOE A-01-R MOD		**pCi/g**		**A-01-R MOD**			**F6H100000-115C**
Thorium 230	58.5	55.7	8.3	0.2	95	95	(68 - 128)
	Batch #:	6222115		**Analysis Date:**	08/15/06		
Iso URANIUM (LONG CT) DOE A-01-R MOD		**pCi/g**		**A-01-R MOD**			**F6H100000-119C**
Uranium 234	19.6	19.7	3.5	0.3	85	101	(75 - 125)
Uranium 238	19.6	21.2	3.7	0.3	85	108	(75 - 122)
	Batch #:	6222119		**Analysis Date:**	08/14/06		
Iso URANIUM (LONG CT) DOE A-01-R MOD		**pCi/g**		**A-01-R MOD**			**F6H100000-120C**
Uranium 234	19.6	19.2	3.7	0.4	91	98	(75 - 125)
Uranium 238	19.6	19.3	3.7	0.4	91	98	(75 - 122)
	Batch #:	6222120		**Analysis Date:**	08/14/06		
Iso URANIUM (LONG CT) DOE A-01-R MOD		**pCi/g**		**A-01-R MOD**			**F6H160000-096C**
Uranium 234	19.6	20.7	4.0	0.4	90	105	(75 - 125)
Uranium 238	19.6	21.8	4.2	0.4	90	111	(75 - 122)
	Batch #:	6228096		**Analysis Date:**	08/18/06		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

MATRIX SPIKE REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot Id: F6H050196
Matrix: SOLID

Date Sampled: 08/02/06
Date Received: 08/05/06

Parameter	Spike Amount	Spike Result	Total Uncert. (2σ +/-)	Spike Yld.	Sample Result	Total Uncert. (2 σ +/-)	QC Sample ID %YLD	QC Sample ID %REC	QC Control Limits
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**		**A-01-R MOD**			**F6H050196-007**	
Uranium 234	3.28	4.41	0.74	84	1.29	0.27	88	95	(68 - 150)
Uranium 238	3.41	4.91	0.81	84	1.43	0.29	88	102	(77 - 150)
	Batch #:	6222119		Analysis Date:		08/14/06			
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**		**A-01-R MOD**			**F6H050196-007**	
Thorium 230	2.05	3.75	0.62	92	1.99	0.38	84	86	(53 - 150)
	Batch #:	6222115		Analysis Date:		08/14/06			
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**		**A-01-R MOD**			**F6H050196-026**	
Thorium 230	2.06	4.76	0.81	78	2.35	0.44	80	117	(53 - 150)
	Batch #:	6222115		Analysis Date:		08/14/06			

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off errors in calculated results.

Laboratory Control Sample/LCS Duplicate Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H050196
Matrix: SOLID

Parameter		Spike Amount	Result	Total Uncert. (2 σ+/-)	% Yld	% Rec	QC Control Limits	Lab Sample ID Precision	
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**A-01-R MOD**				**F6H180000-453C**	
Thorium 230		1.03	1.24	0.24	87	120	(68 - 128)		
	Spk 2	1.03	1.14	0.23	91	110	(68 - 128)	8	%RPD
		Batch #:	6230453		**Analysis Date:**		08/19/06		

NOTE(S)

Calculations are performed before rounding to avoid round-off error in calculated results

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H050196 Date Sampled: 08/02/06
Matrix: SOLID Date Received: 08/05/06

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2σ+/-)	% Yld	QC Sample ID Precision	
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F6H050196-007**	
Uranium 234	1.29		0.27	88	1.40		0.30	77	8	%RPD
Uranium 235/236	0.080	J	0.061	88	0.011	U	0.031	77	152	%RPD
Uranium 238	1.43		0.29	88	1.27		0.28	77	12	%RPD
	Batch #:		6222119 (Sample)		6222119 (Duplicate)					
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F6H050196-007**	
Thorium 228	0.80		0.20	84	0.98		0.23	89	20	%RPD
Thorium 230	1.99		0.38	84	2.10		0.39	89	5	%RPD
Thorium 232	1.01		0.23	84	0.80		0.20	89	23	%RPD
	Batch #:		6222115 (Sample)		6222115 (Duplicate)					
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F6H050196-009**	
Uranium 234	1.86		0.40	78	1.97		0.42	79	6	%RPD
Uranium 235/236	0.066	J	0.066	78	0.096	J	0.079	79	36	%RPD
Uranium 238	1.89		0.40	78	1.95		0.42	79	4	%RPD
	Batch #:		6222120 (Sample)		6222120 (Duplicate)					
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F6H050196-026**	
Thorium 228	0.44		0.15	80	0.57		0.17	81	26	%RPD
Thorium 230	2.35		0.44	80	1.93		0.37	81	20	%RPD
Thorium 232	0.62		0.17	80	0.58		0.16	81	7	%RPD
	Batch #:		6222115 (Sample)		6222115 (Duplicate)					
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F6H050196-028**	
Uranium 234	84		14	101	86		15	92	2	%RPD
Uranium 235/236	4.8		2.0	101	4.1		1.9	92	15	%RPD
Uranium 238	83		14	101	93		16	92	11	%RPD
	Batch #:		6228096 (Sample)		6228096 (Duplicate)					

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Earth Tech	Project Manager: [redacted]	Date: 08/04/06	Chain of Custody Number: 320217
Address: 300 Broadacres Drive	Telephone Number (Area Code)/Fax Number: [redacted]	Lab Number	Page 1 of 4
City: Bloomfield; State: NJ; Zip Code: 07003	Site Contact: Dr. Zack [redacted]		
Project Name and Location (State): Joslyn, Indiana	Carrier/Waybill Number: [redacted]		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Isotopic U	Isotopic Th	Special Instructions/ Conditions of Receipt
GP010001	8/1/06	1026				X	1						X	X	120g
GP020506 GP020506	8/1/06	1115				X	1						X	X	
GP030001	8/1/06	1150				X	1						X		
GP040102	8/1/06	1225				X	1						X		
GP050405	8/1/06	1400				X	1						X	X	
GP060405	8/1/06	1440				X	1						X		
GP070506	8/1/06	1510				X	1						X		
GP080405	8/1/06	1545				X	1						X		
GP090405	8/1/06	1615				X	1						X	X	
GP100708	8/1/06	1708				X	1						X		
HA010002	8/1/06					X	1						X	X	
HA020002	8/1/06					X	1						X	X	

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: [ ] 24 Hours [ ] 48 Hours [ ] 7 Days [ ] 14 Days [ ] 21 Days [X] Other STD

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished [redacted]	08/04/06	1000hrs	1. Received By [redacted]	080506	0815
2. Relinquished [redacted]					
3. Relinquished By			3. Received By		

Comments: Please contact A. Burton with questions

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

OR 3667

STL-4124 (0901)

Client: Earth Tech	Project: [redacted]	Date: 08/04/06	Chain of Custody Number: 320216
Address: 300 Broadacres Drive	Telephone: [redacted]	Lab Number	Page 2 of 4
City: Bloomfield; State: NJ; Zip Code: 07003	[redacted]		
Project Name and Location (State): Joslyn, Indiana			
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Isotopic U	Isotopic Th	Special Instructions/ Conditions of Receipt
HA030002	8/1/06	1815											X	X	120g
HA040002	8/1/06	1830											X	X	
HA050002	8/1/06	1911											X	X	[redacted] 080506
GP110405	8/2/06	1010											X	X	
GP130506	8/2/06	1145											X	X	
GP150304	8/2/06	1400											X	X	
GP160809	8/2/06	1634											X	X	
GP170405	8/2/06	1725											X	X	
GP180304	8/2/06	1800											X		
GP190304	8/2/06	1840											X		
GP210405	8/3/06	1233											X		
GP220405	8/3/06	1330											X		

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify)

	Date	Time		Date	Time
1. [redacted]	08/04/06	1000hrs	1. [redacted]	080506	0815
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: Please contact [redacted] with questions.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Earth Tech

Address: 300 Broadacres Drive

City: Bloomfield | State: NJ | Zip Code: 07003

Project Name and Location (State): Joslyn, Indiana

Contract/Purchase Order/Quote No.:

Date: 8/4/06

Chain of Custody Number: 320215

Lab Number:

Page 3 of 4

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Isotopic U	Isotopic Th	RCRA metals	VOC	Special Instructions/ Conditions of Receipt
1DW-Aqueous-01	8/3/06	2000hrs		X					1	2					X	X	Lp, 2xvial
1DW-Soil-03	8/3/06	2000hrs				X	2								X	X	250g, 120g
GP230506	8/3/06	1420				X	1						X				120g
GP240506	8/3/06	1510				X	1						X				
GP250405	8/3/06	1740				X	1						X	X			
GP260405	8/3/06	1830				X	1						X				
GP270405	8/3/06	1910				X	1						X	X			
GP540102	8/1/06	0900				X	1						X	X			
GP590405	8/1/06	0830				X	1						X	X			
GP670405	8/2/06	0725				X	1						X	X			
GP710405	8/3/06	1000				X	1						X	X			
GP730506	8/3/06	0930				X	1						X				
GP770506	8/3/06	1910				X	1						X	X			

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify):

	Date	Time
1. Relinquished By [redacted]	8/4/06	1000hr
2. Relinquished By [redacted]		
3. Relinquished By		

	Date	Time
1. Received By [redacted]	080506	0815
2. Received By		
3. Received By		

Comments: Please contact Allen Burton with questions

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL St. Louis

Lot #(s): F6H050196

- 3667 -

Condition Upon Receipt Form

Client: Earth Tech
Quote No: 71799
COC/RFA No: 320216-320215-320217
Initiated By: [redacted]
Date: 080506
Time: 0815

Shipping Information

Shipper Name: FedEx
Shipping # (s):*
1. 7905 1501 2041
2.
3.
4.
5.
6.
7.
8.
9.
10.

Multiple Packages Y (N) N/A
Sample Temperature (s):**
1. 4
2.
3.
4.
5.
6.
7.
8.
9.
10.

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Was sample received broken?	8.	(Y) N	Sample received with Chain of Custody?
2.	Y N (N/A)	Was sample received with proper pH[1] ? (If not, make note below)	9.	(Y) N	Chain of Custody matches sample ID's on container(s)?
3.	(Y) N	If N/A-Was pH taken by original STL Lab?	10.	(Y) N	Are there custody seals present on cooler?
4.	(Y) N	Sample received in proper containers?	11.	Y (N) N/A	Do custody seals on cooler appear to be tampered with?
5.	(Y) N	Sample volume sufficient for analysis?	12.	Y (N)	Are there custody seals present on bottles?
6.	Y (N) N/A	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
7.	(Y) N	Were contents of the cooler frisked after opening	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes: Phone conversation w/ Allen Burton: (8/9/06 @ 1315)
1) Iso-Th not needed on GP540102 and GP710405
2) Request lab duplicates on GP160809 and GP010001 (and MS)

Corrective Action:
☐ Client Contact Name: _____ Informed by: _____
☐ Sample(s) processed "as is"
☐ Sample(s) on hold until: _____ If released, notify: _____
Project Management Review: [redacted] Date: 8/9/06

THIS FORM MUST BE COMPLETED A[redacted]TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSO[redacted]QUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

ADMIN-0004, REVISED 03/01/06\\Slsvr01\QA\FORMS\ST-LOUIS\ADMIN\Admin004030106.doc

SEVERN TRENT STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 93631

Joslyn

Lot #: F6H170372

[redacted]

Earth Tech, Inc.
300 Broadacres Drive
Bloomfield, NJ 07003

SEVERN TRENT LABORATORIES, INC.

[redacted]
Project Manager

August 22, 2006

Case Narrative
LOT NUMBER: **F6H170372**

This report contains the analytical results for the two samples received under chain of custody by STL St. Louis on August 17, 2006. These samples are associated with your Joslyn project.

The analytical results included in this report meet all applicable quality control procedure requirements.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

There are no observations or nonconformances associated with these samples.

METHODS SUMMARY

F6H170372

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Isotopic Thorium by Alpha Spectroscopy	EML A-01-R MOD	

References:

EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL"
HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY

SAMPLE SUMMARY

F6H170372

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JCLPA	001	GP230506	08/03/06	14:20
JCLPH	002	GP730506	08/03/06	09:30

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Earth Tech, Inc.

Client Sample ID: GP230506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H170372-001
Work Order: JCLPA
Matrix: SOLID

Date Collected: 08/03/06 1420
Date Received: 08/17/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6230395**	**Yld % 88**
Thorium 228	**0.96**		**0.20**	0.10	**0.04**	**08/18/06**	**08/21/06**
Thorium 230	**2.10**		**0.38**	0.10	**0.03**	**08/18/06**	**08/21/06**
Thorium 232	**0.93**		**0.20**	0.10	**0.02**	**08/18/06**	**08/21/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP230506 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H170372-001X
Work Order: JCLPA
Matrix: SOLID

Date Collected: 08/03/06 1420
Date Received: 08/17/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 6230395	Yld % 89
Thorium 228	0.93		0.20	0.10	0.04	08/18/06	08/21/06
Thorium 230	2.22		0.40	0.10	0.03	08/18/06	08/21/06
Thorium 232	0.93		0.20	0.10	0.01	08/18/06	08/21/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

Earth Tech, Inc.

Client Sample ID: GP730506

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F6H170372-002
Work Order: JCLPH
Matrix: SOLID

Date Collected: 08/03/06 0930
Date Received: 08/17/06 0900

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 6230395**	**Yld % 94**
Thorium 228	**0.75**		**0.17**	0.10	**0.04**	**08/18/06**	**08/21/06**
Thorium 230	**1.44**		**0.27**	0.10	**0.03**	**08/18/06**	**08/21/06**
Thorium 232	**0.80**		**0.17**	0.10	**0.02**	**08/18/06**	**08/21/06**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H170372
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Lab Sample ID Analysis Date
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch # 6230395**		**Yld % 90**	**F6H180000-395B**
Thorium 228	-0.018	U	0.021	0.100	0.047	08/18/06	08/21/06
Thorium 230	**0.041**	**J**	**0.033**	0.100	**0.034**	**08/18/06**	**08/21/06**
Thorium 232	-0.002	U	0.011	0.100	0.024	08/18/06	08/21/06

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H170372
Matrix: SOLID

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID / QC Control Limits
Iso THORIUM (LONG CT) DOE A-01-R MOD		**pCi/g**		**A-01-R MOD**			**F6H180000-395C**
Thorium 230	58.5	53.4	8.8	0.4	94	91	(68 - 128)
	Batch #:	6230395		**Analysis Date:**	08/21/06		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F6H170372
Matrix: SOLID

Date Sampled: 08/03/06
Date Received: 08/17/06

Parameter	SAMPLE Result	Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result	Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**A-01-R MOD**			**F6H170372-001**	
Thorium 228	**0.96**	**0.20**	88	**0.93**	**0.20**	89	3	%RPD
Thorium 230	**2.10**	**0.38**	88	**2.22**	**0.40**	89	6	%RPD
Thorium 232	**0.93**	**0.20**	88	**0.93**	**0.20**	89	0.8	%RPD
	Batch #:	6230395 (Sample)		6230395 (Duplicate)				

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

SEVERN TRENT STL

REANALYSIS/SUB_CONTRACT/CLIENT RETURN FORM

Request Initiated by: [redacted]
Request Date: 8/17/2006
Quote number: 71799

Request is for:
- ____ **return to client**
- ____ Re-analysis
- ____ Sub-Contract sample
- X additional analysis

Old Lot No.: F6H050196

Client ID	Sampled date/time*	Shelf Location	Analysis (include Rad Screen if required)
GP230506	8/3/06 1420	RAD	Iso-Thorium (old sample -015)
GP730506	8/3/06 0930	RAD	Iso-Thorium (old sample -024)

* or attach original Chain of custody

Due Date for new login: 08/24/06

For Sub-Contract or Return to Client:

Shipping Address: _____

Contact person: _____
Phone number: _____

Signature _____

Completed by: [redacted] Date: 08/17/06

New Login Lot No. F6H170372 (place copy of this form in old file)
Initial that Containers were Re-labeled BA (place below Lot no.of old label)

Form: STL-ADMIN-0016, STL-PM-002,Revised 9/01/05

[redacted]

Sent: Thursday, August 17, 2006 2:55 PM
To: [redacted]
Cc: [redacted]
Subject: Joslyn site - additional thorium analyses

Due to field oversight, we failed to designate the following sample for isotopic thorium (long count) analysis; we would like to add Th analysis to this sample:

GP230506

We would also like to re-instate the isotopic Th analysis on the following sample (it had originally been designated for Iso-Th on the COC; but I had called to cancel the analysis. On further review, we would like the iso-Th analysis on this sample).

GP730506.

Please let me know what schedule impact adding these analyses will have. (Note that we would like to have the other data – for the samples already being analyzed – reported as soon as they are ready).

Thanks,

[redacted]

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Earth Tech

Address: 300 Broadacres Drive

City: Bloomfield | State: NJ | Zip Code: 07003

Project Name and Location (State): Joslyn, Indiana

Contract/Purchase Order/Quote No.:

Carrier/Waybill Number: [redacted]

Date: 08/04/06

Chain of Custody Number: 320217

Lab Number:

Page 1 of 4

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Isotopic U	Isotopic Th	Special Instructions/ Conditions of Receipt
GP010001	8/1/06	1026				X	1						X	X	120g
GP020506 GP020506	8/1/06	1115				X	1						X	X	
GP030001	8/1/06	1150				X	1						X		
GP040102	8/1/06	1225				X	1						X		
GP050405	8/1/06	1400				X	1						X	X	
GP060405	8/1/06	1440				X	1						X		
GP070506	8/1/06	1510				X	1						X		
GP080405	8/1/06	1545				X	1						X		
GP090405	8/1/06	1615				X	1						X	X	
GP100708	8/1/06	1708				X	1						X		
HA010002	8/1/06					X	1						X	X	
HA020002	8/1/06					X	1						X	X	

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: [ ] 24 Hours [ ] 48 Hours [ ] 7 Days [ ] 14 Days [ ] 21 Days [X] Other STD

QC Requirements (Specify):

		Date	Time
1. Relinquished [redacted]		08/04/06	1000hrs
2. Relinquished [redacted]			
3. Relinquished By			

		Date	Time
1. [redacted]		080506	0815
2.			
3. Received By			

Comments: Please contact [redacted] with questions

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

OR 36667

STL-4124 (0901)

Client: Earth Tech

Address: 300 Broadacres Drive

City: Bloomfield | State: NJ | Zip Code: 07003

Project Name and Location (State): Joslyn, Indiana

Contract/Purchase Order/Quote No.:

Project Manager: [redacted]

Carrier/Waybill Number: [redacted]

Date: 08/04/06

Chain of Custody Number: 320216

Lab Number:

Page 2 of 4

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Isotopic U	Isotopic Th	Special Instructions/ Conditions of Receipt
HA030002	8/1/06	1815											X	X	120g
HA040002	8/1/06	1830											X	X	[redacted] 080506
HA050002	8/1/06	1911											X	X	
GP110405	8/2/06	1010											X	X	
GP130506	8/2/06	1145											X	X	
GP150304	8/2/06	1400											X	X	
GP160809	8/2/06	1634											X	X	
GP170405	8/2/06	1725											X	X	
GP180304	8/2/06	1800											X		
GP190304	8/2/06	1840											X		
GP210405	8/3/06	1233											X		
GP220405	8/3/06	1330											X		

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify):

	Date	Time		Date	Time
1. [redacted]	08/04/06	1000hrs	1. Received By [redacted]	080506	0815
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: Please contact [redacted] with questions.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Earth Tech

Address: 300 Broadacres Drive

City: Bloomfield | State: NJ | Zip Code: 07003

Project Name and Location (State): Joslyn, Indiana

Contract/Purchase Order/Quote No.:

[redacted]

Carrier/Waybill Number:

Date: 8/4/06

Chain of Custody Number: 320215

Lab Number:

Page 3 of 4

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Isotopic U	Isotopic Th	RCRA metals	VOC	Special Instructions/ Conditions of Receipt
IDW-Aqueous-01	8/3/06	2000hrs		X					1	2					X	X	Lp, 2x vial
IDW-Soil-03	8/3/06	2000hrs				X	2								Y	Y	250g, 120g
GP230506	8/3/06	1420				X	1						X				120g [redacted]
GP240506	8/3/06	1510				X	1						X				
GP250405	8/3/06	1740				X	1						X	X			
GP260405	8/3/06	1830				X	1						X				
GP270405	8/3/06	1910				X	1						X	X			
GP540102	8/1/06	0900				X	1						X	X			
GP590405	8/1/06	0830				X	1						X	X			
GP670405	8/2/06	0725				X	1						X	X			
GP710405	8/3/06	1000				X	1						X	X			
GP730506	8/3/06	0930				X	1						X				
GP770506	8/3/06	1910				X	1						X	X			

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: [ ] 24 Hours [ ] 48 Hours [ ] 7 Days [ ] 14 Days [ ] 21 Days [X] Other STD

QC Requirements (Specify):

	Date	Time
1. Relinquished By [redacted]	8/4/06	1000hrs
2. Relinquished By		
3. Relinquished By		

	Date	Time
1. [redacted]	080506	0815
2. Received By		
3. Received By		

Comments: Please contact [redacted] with questions

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL St. Louis

Lot #(s): F6H050196

- 3667 -

Condition Upon Receipt Form

Client: Earth Tech
Quote No: 71799
COC/RFA No: 320216-320215-320217
Initiated By: [redacted]
Date 080506
Time: 0815

Shipping Information

Shipper Name: Fed Ex
Shipping # (s):*
1. 7905 1501 2041
2.
3.
4.
5.
6.
7.
8.
9.
10.

Multiple Packages Y (N) N/A
Sample Temperature (s):**
1. 4
2.
3.
4.
5.
6.
7.
8.
9.
10.

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Was sample received broken?	8.	(Y) N	Sample received with Chain of Custody?
2.	Y N (N/A)	Was sample received with proper pH[1] ? (If not, make note below)	9.	(Y) N	Chain of Custody matches sample ID's on container(s)?
3.	(Y) N	If N/A-Was pH taken by original STL Lab?	10.	(Y) N	Are there custody seals present on cooler?
4.	(Y) N	Sample received in proper containers?	11.	Y (N) N/A	Do custody seals on cooler appear to be tampered with?
5.	(Y) N	Sample volume sufficient for analysis?	12.	Y (N)	Are there custody seals present on bottles?
6.	Y (N) N/A	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
7.	(Y) N	Were contents of the cooler frisked after opening	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL contai[redacted]d, EXCEPT VOA, TOX and soils.

Notes: Phone conversation w/ [redacted] (8/9/06 @ 1315)
1) Iso-Th not needed on GP340102 and GP710405
2) Request lab duplicates on GP1600809 and GP010001 (and MS)

Corrective Action:
☐ Client Contact Name: Informed by:
☐ Sample(s) processed "as is"
☐ Sample(s) on hold until: If released, notify:
Project Management Review: [redacted] Date: 8/9/06

THIS FORM MUST BE COMPLETED [redacted]E THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

ADMIN-0004, REVISED 03/01/06\\Slsvr01\QA\FORMS\ST-LOUIS\ADMIN\Admin004030106.doc

HOLE NO. HA01

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: N/A	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 2-in diameter Hand Auger	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Backfilled with augered soil upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 1.5 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1		Native topsoil, trace f-c gravel (dry)	1.5		DPT		HA01 located on west side of property. Background soil sample. HA01 Background Beta/Gamma Contamination (Ludlum 44-9) 32 cpm.
	2		End of boring at 1.5 ft bgs					**HA010002 @ 17:45** Sampled 0 - 1.5 ft interval (native material).
	3							
	4							
	5							
	6							

HOLE NO. HA02

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: N/A	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 2-in diameter Hand Auger	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Backfilled with augered soil upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 2 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1		Native topsoil, trace f-c gravel (dry)	2		DPT		HA02 located on west side of property. Background soil sample. HA01 Background Beta/Gamma Contamination (Ludlum 44-9) 38 cpm. **HA020002 @ 18:05**
	2		End of boring at 2 ft bgs					Sampled 0 - 2 ft interval (native material).
	3							
	4							
	5							
	6							

HOLE NO. HA03

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: N/A	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 2-in diameter Hand Auger	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Backfilled with augered soil upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NA [redacted]		
9. TOTAL DEPTH OF HOLE: 2 ft	21. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1		Native topsoil, trace f-c gravel (dry)	2		DPT		HA03 located on west side of property. Background soil sample. HA03 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm. **HA030002 @ 18:15**
	2		End of boring at 2 ft bgs					Sampled 0 - 2 ft interval (native material).
	3							
	4							
	5							
	6							

HOLE NO. HA04

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Backfilled with augered soil upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 2 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1		Native topsoil, trace f-c gravel (dry)	2		DPT		HA04 located on west side of property. Background soil sample. HA04 Background Beta/Gamma Contamination (Ludlum 44-9) 75 cpm. **HA040002 @ 18:30**
	2		End of boring at 2 ft bgs					Sampled 0 - 2 ft interval (native material).
	3							
	4							
	5							
	6							

HOLE NO. HA05

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: N/A	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 2-in diameter Hand Auger	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Backfilled with augered soil upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 2 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1		Native topsoil, trace f-c gravel (dry)	2		DPT		HA05 located on west side of property. Background soil sample. HA05 Background Beta/Gamma Contamination (Ludlum 44-9) 48 cpm. **HA050002 @ 18:11**
	2		End of boring at 2 ft bgs					Sampled 0 - 2 ft interval (native material).
	3							
	4							
	5							
	6							

HOLE NO. GP01

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U & Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1 2		Silt, some f-c sand, little f gravel; stained black to reddish brown, moist at 1.8 to 2.1 ft (FL)	2.1		DPT		GP01 located in Potential Old Burn Area III. GP01 Background Beta/Gamma Contamination (Ludlum 44-9) 180 cpm. **GP010001 @ 10:26** Sampled 0.5 - 1.0 ft interval (fill material) due to radiation reading above background (5,000 cpm on sample).
	3							
	4		0.2 ft; Silt, some f-c sand, little f gravel; stained black to reddish brown (FL)	1.3				
	5		0.2 - 1.3 ft; Clay, little silt; grey and reddish brown mottled, moist (CL)					
	6							

HOLE NO. GP01

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana

20. NAME OF INSPECTOR: [redacted]

2. COMPANY: Earth Tech

21. SIGNATURE OF INSPECTOR:

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			0				
	9							
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP02

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U & Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.2 ft; F-c sand, little silt, little concrete; brown to grey (FL)	2		DPT		GP02 located in Potential Old Burn Area III.
			0.2 - 0.3 ft; Brick; red, dry (FL)					
	1		0.3 - 1.7 ft; F-c sand, little silt, trace f gravel; stained black, wet (FL)					GP02 Background Beta/Gamma Contamination (Ludlum 44-9) 47 cpm.
			1.7 - 2 ft; Silty clay; black, moist (FL)					**GP020506 @ 11:15** Sampled 5.0 - 5.5 ft interval (native material).
	2							
	3							
	4			3.4				
			1.2 ft; Clay, little silt, little f sand; black to dark grey, moist (FL)					
	5							
			1.2 - 2.8 ft; Clay, little silt; orange and brown mottled, moist-dry (CL)					
	6							

HOLE NO. GP02

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NA[redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7		2.8 - 3.4 ft; F-m sand, trace silt; orange and med grey mottled, moist (SM)					
	8			1.7				
	9		F-m sand; orange and brown mottled, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP03

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILL CREW: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.8 ft; F-c sand, some silt, little concrete, slag, coal; black and orange, dry (FL)	2.3		DPT		GP03 located in Potential Old Burn Area III.
	1		0.8 - 1.3 ft; Silt, some f sand, trace clay; light brown and orange mottled, moist (FL)					GP03 Background Beta/Gamma Contamination (Ludlum 44-9) 40 cpm.
	2		1.3 - 2.3 ft; Clay, little silt, trace f gravel; light brown and orange mottled, dry (FL)					**GP020506 @ 11:15** Sampled 0.5 - 1.0 ft interval (fill material) due to radiation reading above background (280 cpm on sample).
	3							
	4		0.3 ft; F-m sand, trace silt; light brown and orange mottled, moist (FL)	4				
	5		0.3 - 4 ft; Clay, little silt, trace f sand; orange and grey mottled, moist (CL)					
	6							

HOLE NO. GP03

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8							
			F-c sand; orange and brown mottled, wet (SW)	1.3				
	9							
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP04

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.6 ft; Gravel; dry (FL)	2.5		DPT		GP04 located in Potential Old Burn Area III.
			0.6 - 0.8 ft; F-c gravel, little f-c sand, little silt; black stained, dry (FL)					
	1		0.8 - 2.2 ft; F-m sand; grey and orange mottled, moist (SW)					GP04 Background Beta/Gamma Contamination (Ludlum 44-9) 30 cpm. **GP040102 @ 12:25** **GP540102 @ 09:00 (dup)**
	2		2.2 - 2.5 ft; Silt, little f sand, trace clay; black to dark grey, moist (SM)					Sampled 1.0 - 1.5 ft interval (native material).
	3							
	4			4				
	5		Silty clay, some f-c sand; orange and brown mottled, moist (SM)					
	6							

HOLE NO. GP04

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		0.3 ft; Silty clay, some f-c sand; orange and brown mottled, moist (SM)	1.3				
	9		0.3 - 1.3 ft; F-c sand; orange to brown, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP05

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 11 ft	21. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.4 ft; Asphalt; black, dry (FL)	2.3		DPT	1.2	GP05 located in Potential Old Burn Area I.
	1		0.4 - 1.3 ft; Gravel road base; med grey, dry (FL)				1.0	GP05 Background Beta/Gamma Contamination (Ludlum 44-9) 28 cpm.
	2		1.3 - 2.3 ft; F-c gravel, slag, red brick, trace silt; black to dark grey, dry (FL)				0.1	**GP050405 @ 14:00** USACE collected QA sample for Isotopic U
	3						0.0	Sampled 4.0 - 4.5 ft interval (native material).
	4			2.7				
	5		2.3 ft; Clay, little silt; grey, moist (CL)					
	6							

HOLE NO. GP05

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION: Fort Wayne, Indiana	20. NAME OF INSPECTOR: [redacted]	
2. COMPANY: Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
			2.3 - 2.7 ft; Clay, little silt; grey and tan mottled, moist (CL)				0.0	
	7							
	8			3.2				
			1.8 ft; Clay, little silt; grey and tan mottled, moist (CL)					
	9							
	10		1.8 - 3.2 ft; F-c sand, trace silt; grey, moist (SM)					
	11		End of boring at 11 ft bgs					
	12							
	13							
	14							

HOLE NO. GP06

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NA[redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.6 ft; Asphalt and gravel road base; dry (FL)	2.3		DPT	1.1	GP06 located in Potential Old Burn Area I.
	1		0.6 - 1.3 ft; F-c gravel, trace silt; black to orange, dry (FL)				1.2	GP06 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm.
	2		1.3 - 2.2 ft FL - F-c gravel, little yellow fire brick, trace silt; black to orange, moist-wet (FL)				0.2	**GP060405 @ 14:40**
	3							Sampled 4.0 - 4.5 ft interval (native material).
	4			2.8				
	5		Clay, little silt; medium grey and orange mottled, moist (CL)					
	6							

HOLE NO. GP06

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			1.4				
	9		Clay, little silt; medium grey and orange mottled, moist (CL)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP07

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.7 ft; Concrete and gravel road base; dry (FL)	2.5		DPT		GP07 located in Potential Old Burn Area I.
	1		0.7 - 1.3 ft; Gravel, trace silt; brown, wet (FL)					GP07 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm.
	2		1.3 - 2.5 ft; Gravel, trace silt; grey, moist (FL)					**GP070506 @ 15:10**
	3							Sampled 5.0 - 5.5 ft interval (native material).
	4			2.3				
	5		Clay, little silt; medium grey and orange mottled, moist (CL)					
	6							

HOLE NO. GP07

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NA[redacted]	
2. COMPANY Earth Tech	21. SI[redacted]	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			0				
	9							
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP08

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NA[redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.3 ft; Concrete; grey, dry (FL)	2		DPT		GP08 located in Potential Old Burn Area II.
	1		0.3 - 1.8 ft; Gravel, trace f-c sand, trace silt; black and orange, moist (FL)					GP08 Background Beta/Gamma Contamination (Ludlum 44-9) 40 cpm.
	2		1.8 - 2 ft; silty clay, some f-c sand; dark grey, moist (FL)					**GP080405 @ 15:45**
	3							Sampled 4.0 - 4.5 ft interval (native material).
	4		0.8 ft; F-c sand, trace clay, trace silt, trace white shells; grey, moist (SM)	4				
	5		0.8 - 4 ft; Clay, little silt, trace f-c sand; orange and brown mottled, dry (CL)					
	6							

HOLE NO. GP08

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		0.5 ft; Clay, little silt, trace f-c sand; orange and brown mottled, dry (CL)	1.7				
	9		F-c sand, trace f gravel; orange to brown, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP09

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U & Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
				2.3		DPT		GP09 located in Potential Old Burn Area II.
	1		1.8 ft; F-c sand, little silt, little concrete; brown, dry (FL)					GP09 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm.
								GP090405 @ 16:15
	2		1.8 - 2.3 ft; F-c sand, little silt, little concrete; dark brown to black, dry (FL)					**GP590405 @ 08:30 (dup)**
								Sampled 4.0 - 4.5 ft interval (native material).
	3							
	4		0.9 ft grey SM, silt, little f sand (moist)	2.1				
	5		0.9 - 2.1 ft; Clay, little silt, little f sand; grey and brown mottled, moist (CL)					
	6							

HOLE NO. GP09

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS

1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		F-C sand, little f gravel; grey and brown mottled, wet (SW)	1.4				
	9		F-C sand, little f gravel; orange to brown, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP10

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/1/2006	17. DATE HOLE COMPLETED: 8/1/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			1.6 ft Brick; red, dry (FL)	2.3		DPT		GP10 located in Potential Old Burn Area II.
	1							GP10 Background Beta/Gamma Contamination (Ludlum 44-9) 30 cpm.
			1.6 - 2.3 ft; Concrete and slag; grey to black, dry (FL)					**GP100708 @ 17:08**
	2							Sampled 7.0 - 7.5 ft interval (native material).
	3							
	4		0.9 ft; Concrete and slag; grey to black, dry (FL)	1.6				
	5		0.9 - 1.6 ft; Clay, little silt; red and brown mottled, moist (CL)					
	6							

HOLE NO. GP10

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		0.8 ft; Clay, little silt; red and brown mottled, moist (CL)	2.9				
	9		0.8 - 2.9 ft; F-c sand; red to brown, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP11

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			0.5 ft; Concrete; grey (FL)	1.8		DPT		GP11 located in Lathe Room.
			0.5 - 1 ft; F-c gravel; orange to black, dry (FL)					GP11 Background Beta/Gamma Contamination (Ludlum 44-9) 33 cpm.
	1		1 - 1.8 ft; Clay and silt, little f-c sand; orange to brown mottled, moist (FL)					**GP110405 @ 16:10**
	2							Sampled 4.0 - 4.5 ft interval (native material).
	3							
	4			2.8				
	5		Clay, little silt, trace f sand; orange to brown mottled, moist (CL)					
	6							

HOLE NO. GP11

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NA[redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		0.8 ft; Clay, little silt, trace f sand; orange to brown mottled, moist (CL)	1.5				
	9		0.8 - 1.5 ft; F-c sand, trace silt; orange to brown mottled, moist-wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP12

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: N/A	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 1.3 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1 2 3 4 5 6		Cored through 1.3 ft of concrete. Core bit refusal. Could not relocated due to utilities, railroad tracks, and non-mobil machinery. USACE concurred to abandon location.			DPT		GP12 located in Product Storage Area. GP12 Background Beta/Gamma Contamination (Ludlum 44-9) N/A. **NO SAMPLE COLLECTED**

HOLE NO. GP13

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAM[redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	1 2		Concrete, f-c gravel; stained black (FL)	2.3		DPT	0.2	GP13 located in Electric Furnace Area. GP13 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm. **GP130506 @ 11:45** Sampled 5.0 - 5.5 ft interval (native material).
	3 4							
	5 6		1 ft; Concrete, f-c gravel; stained black (FL) 1 - 2.7 ft; Clay, little silt; olive and orange-brown mottled, moist (CL)	2.7				

HOLE NO. GP13

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			1.6				
			1.2 ft; Clay, little silt; olive and orange-brown mottled, moist (CL)					
	9							
			1.2 - 1.6 ft; F-c sand, little gravel; grey, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP14

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: N/A	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 2 ft	21. SIGNATURE OF INSPECTOR:		

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			Made 3 attempts through >2 ft concrete. Core bit refusal. USACE concurred to abandon location.			DPT		GP14 located in Milling Area.
	1							GP14 Background Beta/Gamma Contamination (Ludlum 44-9) 45 cpm.
								NO SAMPLE COLLECTED
	2							
	3							
	4							
	5							
	6							

HOLE NO. GP15

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 1 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 4 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drilled through 1.3 ft concrete) Silty clay, little f-c sand, trace f gravel; black to dark brown, moist (FL)	1		DPT		GP15 located in Milling Area Area.
	1							GP15 Background Beta/Gamma Contamination (Ludlum 44-9) 57 cpm.
								GP150304 @ 14:00
	2							
								Sampled bottom 0.5 ft of core due to refusal at 4 ft (fill material).
	3							
	4		End of boring at 4 ft bgs					
	5							
	6							

HOLE NO. GP16

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	1.7		DPT		GP16 located in Straightener Area.
	1		0.8 - 1.1 ft; Silt and clay; brown (FL)					GP16 Background Beta/Gamma Contamination (Ludlum 44-9) 35 cpm.
			1.1 - 1.7 ft; Silty clay, little gravel, trace coal; brown and orange mottled (FL)					**GP160809 @ 16:34**
	2							Sampled 8.0 - 8.5 ft interval (native material).
	3							
	4			0				
	5							
	6							

HOLE NO. GP16

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		1.1 ft; Silty clay; orange and brown mottled, dry-moist (CL)	2				
	9		1.1 - 2 ft; F-c sand, little silt; orange and brown mottled, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP17

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	1.9		DPT		GP17 located in Swing Grinding Area.
	1		0.8 - 1.9 ft; Concrete and brick, some f-c sand, some silt; (FL)					GP17 Background Beta/Gamma Contamination (Ludlum 44-9) 48 cpm.
								GP170405 @ 17:25
	2							**GP570405 @ 07:25 (dup)**
								Sampled 4.5 - 5 ft interval (native material).
	3							
	4		0.7 ft; Concrete and brick, some f-c sand, some silt; (FL)	4				
	5		0.7 - 4 ft; Silty clay, trace f-c sand; orange and brown mottled, moist (CL)					
	6							

HOLE NO. GP17

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION: Fort Wayne, Indiana	20. NAME OF INSPECTOR: [redacted]	
2. COMPANY: Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			1.9				
	9		1.5 ft; Silty clay, trace f-c sand; orange and brown mottled, moist (CL)					
			1.5 - 1.9 ft; F-c sand, little silt; orange and brown mottled, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP18

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	2.3		DPT		GP18 located in Swing Grinding Area.
	1		0.8 - 2 ft; Concrete, little brick, little silty clay; black (FL)					GP18 Background Beta/Gamma Contamination (Ludlum 44-9) 52 cpm. **GP180304 @ 18:00**
	2		2 - 2.3 ft; Silt, little clay, little f sand; brown stained (SM)					Sampled 3.5 - 4 ft interval (native material).
	3							
	4		0.7 ft; Silt, little clay, little f sand; brown stained (SM)	4				
	5		0.7 - 4 ft; Silty clay; orange and brown mottled, moist (CL)					
	6							

HOLE NO. GP18

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		1.3 ft; Silty clay; orange and brown mottled, moist (CL)	2				
	9		1.3 - 2 ft; F-c sand, little f gravel; orange and brown mottled, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP19

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/2/2006	17. DATE HOLE COMPLETED: 8/2/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR		

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.7 ft concrete)	2.7		DPT		GP19 located in Swing Grinding Area.
	1		0.7 - 2.2 ft; Concrete, little brick, little silty clay; black (FL)					GP19 Background Beta/Gamma Contamination (Ludlum 44-9) 47 cpm. **GP190304 @ 18:40**
	2		2.2 - 2.7 ft; Silty clay, trace f sand; orange and brown mottled with black staining (FL)					Sampled 3.5 - 4 ft interval (native material).
	3							
	4			4				
	5		Silty clay, trace f sand; red and brown mottled, moist (CL)					
	6							

HOLE NO. GP19

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		1 ft; Silty clay, trace f sand; red and brown mottled, moist (CL)	2				
	9		1 - 2 ft, F-c sand, trace silt; red and brown mottled, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP20

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: N/A	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 1.3 ft	21. SIGNATURE OF INSPECTOR:		

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 1.3 ft concrete on attempt #1)			DPT		GP20 located in Grinding Area.
			(Drill through 1.7 ft concrete on attempt #2)					GP20 Background Beta/Gamma Contamination (Ludlum 44-9) 45 cpm.
	1		(Drill through 1.8 ft concrete on attempt #3)					
			Core bit refusal. USACE concurred to abandon location.					**NO SAMPLE COLLECTED**
	2							
	3							
	4							
	5							
	6							

HOLE NO. GP21

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 1.4 ft concrete)	1.5		DPT		GP21 located in Grinding Area.
	1							GP21 Background Beta/Gamma Contamination (Ludlum 44-9) 50 cpm.
			1.2 ft; Concrete, brick, little silt; black (FL)					**GP210405 @ 12:33**
	2							**GP710405 @ 10:00 (dup)**
			1.4- 1.5 ft; Silt, little f-c gravel, little f-c sand; black staining, wet (FL)					Sampled 4 - 4.5 ft interval (native material).
	3							
	4			3.3				
	5		Silty clay, trace f sand; medium grey, moist (CL)					
	6							

HOLE NO. GP21

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			2				
	9		Silty clay, trace f sand; red and brown mottled, moist (CL)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP22

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
				1.9		DPT		GP22 located in RSSI Boring Area (BLDG 8).
	1		(Drill through 1.1 ft concrete)					GP22 Background Beta/Gamma Contamination (Ludlum 44-9) 41 cpm.
	2		1.7 ft; Concrete, little silt; black (FL)					**GP220405 @ 13:30**
								Sampled 4.5 - 5 ft interval (native material).
	3		1.7- 1.9 ft; Silty clay, little f-c gravel; black, moist (FL)					
	4		0.3 ft; Silty clay, little f-c gravel; black, moist (FL)	2.2				
	5		0.3- 2.2 ft; Silty clay, trace f sand; dark grey, moist (CL)					
	6							

HOLE NO. GP22

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			2				
	9		Silty clay, trace f sand;medium grey and brown mottled, moist (CL)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP23

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 1.2 ft concrete)	1.8		DPT		GP23 located in RSSI Boring Area (BLDG 8).
	1							GP23 Background Beta/Gamma Contamination (Ludlum 44-9) 48 cpm.
	2		1.8 ft; Concrete, little silty clay, slag; black (FL)					**GP230506 @ 14:20** **GP730506 @ 09:30 (dup)** Sampled 5 - 5.5 ft interval (native material).
	3							
	4		0.3 ft; Concrete, little silty clay, slag; black (FL)	2.6				
	5		0.3 - 2.6 ft; Silty clay, trace f sand; medium grey and olivfe mottled, moist (CL)					
	6							

HOLE NO. GP23

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF SHEETS 2
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			1.2				
			Silty clay, trace f sand; medium grey and olive mottled, wet-moist (CL)					
	9							
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP24

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 1.1 ft concrete)	2		DPT		GP24 located in RSSI Boring Area (BLDG 8).
	1		1.7 ft; Concrete, f-c gravel, little f-c sand, trace silt; black to dark grey, moist (FL)					GP24 Background Beta/Gamma Contamination (Ludlum 44-9) 55 cpm.
	2		1.7 - 2 ft; Silt, little clay, trace f gravel; black to dark grey (FL)					**GP240506 @ 15:10**
	3							Sampled 5 - 5.5 ft interval (native material).
	4		1 ft; Silt, little clay, trace f gravel; black to dark grey (FL)	2.2				
	5		1 - 2.2 ft; Silt, little clay, trace f gravel; medium grey and orange mottled, moist (CL)					
	6							

HOLE NO. GP24

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			2				
	9		1.7 ft; Silt, little clay, trace f gravel; medium grey and orange mottled, moist (CL)					
			1.7 - 2 ft; F-c sand, trace silt; grey and orange mottled, wet (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP25

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	1.9		DPT		GP25 located in Old Pickling Tank Area.
	1		1 ft; Concrete, f-c gravel, brick; black, dry (FL)					GP25 Background Beta/Gamma Contamination (Ludlum 44-9) 42 cpm.
	2		1.1 - 1.9 ft; F-c gravel, silt, f-c sand; black, moist (FL)					**GP250405 @ 17:40**
	3							Sampled 4.5 - 5 ft interval (native material).
	4		0.3 ft; Silt, c-f gravel, wood; black to dark grey (FL)	3.7				
	5		0.3 - 3.7 ft; Silt, little clay, trace f sand; grey and orange mottled, moist (CL)					
	6							

HOLE NO. GP25

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			2			0.1	
			1.1 ft; Silt, little clay, trace f sand; black, moist (CL)					
	9							
			1.1 - 2 ft; F-c sand, trace silt; black and orange mottled, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP26

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	1.7		DPT		GP26 located in Grinding Area.
	1		1.7 ft; Concrete, f-c gravel; black, moist (FL)					GP26 Background Beta/Gamma Contamination (Ludlum 44-9) 56 cpm. **GP260405 @ 18:30** Sampled 4.5 - 5 ft interval (native material).
	2							
	3							
	4		0.5 ft; Concrete, f-c gravel; black, moist (FL)	4				
	5		0.5 - 4 ft; Silt, little clay, trace f sand; grey and black, moist (CL)					
	6							

HOLE NO. GP26

HTW DRILLING LOG	PROJECT Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION Fort Wayne, Indiana	20. NAME OF INSPECTOR [redacted]	
2. COMPANY Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEV-ATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8		0.7 ft; Silt, little clay, trace f sand; grey and black, moist (CL)	1.4				
	9		0.7 - 1.4 ft; F-c sand, little silt; orange and grey mottled, moist (SW)					
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							

HOLE NO. GP27

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 1 OF 2 SHEETS

1. LOCATION: Fort Wayne, Indiana	10. NO. OF OVERBURDEN GEOTECH SAMPLES: 0	DISTURBED: 0	UNDISTURBED: 0
2. COMPANY: Earth Tech	11. SAMPLES FOR CHEMICAL ANALYSIS: 1	12. SAMPLE ANALYSIS: Isotopic U and Th	
3. DRILLING COMPANY: Earth Exploration, Inc.	13. SURFACE ELEVATION AT HOLE: N/A	14. ELEVATION DATUM: Ground surface	
4. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 6600, box-truck mount	15. DEPTH OF GROUNDWATER ENCOUNTERED: N/A		
5. SIZE AND TYPE OF EQUIPMENT: 1.5-in diameter, 48-in long Macro-Core Sampler	16. DATE HOLE STARTED: 8/3/2006	17. DATE HOLE COMPLETED: 8/3/2006	
6. NAME OF DRILLER: [redacted]	18. TOTAL NO. OF CORE BOXES: None		
7. THICKNESS OF OVERBURDEN: N/A	19. DISPOSITION OF HOLE: Grouted upon completion		
8. DEPTH DRILLED INTO ROCK: N/A	20. NAME OF INSPECTOR: [redacted]		
9. TOTAL DEPTH OF HOLE: 10 ft	21. SIGNATURE OF INSPECTOR:		

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
			(Drill through 0.8 ft concrete)	1.8		DPT		GP27 located in Grinding Area.
	1		1.7 ft; Concrete, f-c gravel; black, moist (FL)					GP27 Background Beta/Gamma Contamination (Ludlum 44-9) 58 cpm.
	2							**GP270405 @ 19:10**
								Sampled 4 - 4.5 ft interval (native material).
	3							
	4			2.8				
	5		Silty clay, trace f sand; grey to brown, moist (CL)					
	6							

HOLE NO. GP27

HTW DRILLING LOG	PROJECT: Joslyn Manufacturing Site	SHEET 2 OF 2 SHEETS
1. LOCATION: Fort Wayne, Indiana	20. NAME OF INSPECTOR: [redacted]	
2. COMPANY: Earth Tech	21. SIGNATURE OF INSPECTOR	

ELEVATION	DEPTH (FEET)	LEGEND	CLASSIFICATION OF MATERIAL	REC. (ft)	SAMPLE No. (TIME)	BLOW COUNT	FIELD SCREEN RESULT	REMARKS
	6							
	7							
	8			0				
	9							
	10		End of boring at 10 ft bgs					
	11							
	12							
	13							
	14							