



March 6, 2009

Mr. Jordan Garrard
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, Georgia 30303

**Subject: Final Emergency Response Letter Report
Richards Metal Plating Response
Florence, Lauderdale County, Alabama
EPA Contract No. EP-W-05-054
TDD No. TTEMI-05-001-0082**

Dear Mr. Garrard:

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting this final emergency response letter report for the Richards Plating response in Florence, Lauderdale County, Alabama. Initially, the U.S. Environmental Protection Agency (EPA) requested that Tetra Tech START perform a removal assessment at the Richards Metal Plating facility. This was tasked under Technical Direction Document TTEMI-05-003-0054 issued October 10, 2008. However, after examining the site and considering the potential for a release, EPA On-Scene Coordinator (OSC) Jeff Crowley determined there was sufficient cause to initiate an emergency removal of the waste in the building. A new technical direction document (TDD) was issued, TTEMI-05-001-0082, under which all subsequent activity would be tasked. Specifically, START was tasked to provide written and photographic documentation, conduct air monitoring, conduct multimedia sampling, and provide analytical support. All reporting required under TDD No. TTEMI-05-003-0054 will also be included in this report.

This letter report summarizes field activities during the initial site assessment and emergency response, and includes seven appendices. Appendix A provides figures, Appendix B provides a copy of the logbook notes, and Appendix C contains a photographic log. Appendix D provides summary tables of the collected waste and environmental analytical samples. Appendix E provides the complete data validation reports for the sampling results. Appendix F provides a container inventory, and Appendix G presents a table of witnesses.

BACKGROUND

Richards Metal Plating is located at 529 South Royal Avenue in Florence, Lauderdale County, Alabama (see Figure 1). Currently, Mr. Billy Ray Richards is the owner of the property. The facility plated nickel and chromium onto used vehicle bumpers and truck accessory parts utilizing separate stripping and plating lines. According to Alabama Department of Environmental Management (ADEM) records, in 2004, the site was listed as a Resource Conservation and Recovery Act (RCRA)-Small Quantity Generator (SQG). The facility ceased operations in 2006. Inspections by ADEM revealed that the site was inactive and abandoned by May 25, 2006.

The site consists of approximately 3.27 acres, bisected by an unnamed tributary to Sweetwater creek (see Figure 2). The Tennessee River lies less than 1 mile downstream. The portion opposite the tributary

contains a large field of automobile bumpers. A large metal building sits on the site and is in various stages of disarray and disrepair. The building consists of several interconnecting rooms: an office, a storage area, a plating room, a rectifier room, and the stripping and filter room (See Figures 2 and 3).

SITE ASSESSMENT ACTIVITIES

Under TDD No. TTEMI-05-003-0054, Tetra Tech, EPA, and ADEM personnel performed an initial site assessment on November 11, 2008. EPA OSCs Jordan Garrard and Jeff Crowley, Tetra Tech START member Charles Berry, and ADEM personnel Dave Davis and Bonnie Temple were present. Mr. Richards met with the group and entered the building to open it up, allowing adequate lighting and ventilation. Tetra Tech entered the building with air monitoring for combustible vapors, oxygen levels, hydrogen sulfide, carbon monoxide, and volatile organic compounds (VOC). No elevated reading of any contaminant above background was noticed, and oxygen levels remained constant at 20.9%. Inside the building, Tetra Tech observed hundreds of containers, many which were open with hazardous material labels; several open vats labeled "chromic acid" and "sodium hydroxide"; and two completely full outdoor vats positioned several feet from the creek. During the walk-through, a large area of discolored concrete block was noticed running down the back of the building, in the vicinity of the overflowing vats. Noticeable erosion led from the stains into the creek. The bumper yard was overgrown with kudzu, and contained approximately 0.25 acre of used bumpers several feet high. The building itself was in rapid decay, with the effects of vandals and thieves apparent. Large sections of the rear wall were missing, electrical conduit dangled from the ceiling, and the wooden gangplanks along the edges of the vats were rotten, making access treacherous. The roof of the building was in various stages of disrepair, and had allowed rainfall to collect in the secondary containments around the vats in the plating line. Thieves had removed two stainless steel vats from the plating line, damaging the inner secondary containment partitions. In contrast to the deterioration of the southern end of the building, the northern end, consisting of the storage room and the offices, was in fair shape, with no observable structural damage. Mr. Richards provided a brief explanation of the stripping and plating processes, as well as a brief description of the contents of most of the drums and small containers. Photographs were taken of the obvious dangers, and the site visit was concluded.

Upon returning to the office, OSC Crowley discussed the findings of the visit with ADEM officials. Based on expected upcoming rain events, OSC Crowley initiated an emergency response to prevent migration of the wastes contained in unstable, open vats subject to rain infiltration. On November 17, 2008, EPA issued Tetra Tech TDD No. TTEMI-05-001-0083 to initiate emergency response activities at the site.

RESPONSE ACTIVITIES

On Tuesday, November 18, 2008, Tetra Tech personnel Chuck Berry and Kyle Russell arrived at Richards Metal Plating and met with OSCs Garrard, Steve Spurlin, and Alyssa Hughes. WRScompass (WRS), the Emergency and Rapid Response Services (ERRS) contractor selected for the site, and United States Environmental Services (USES), a subcontractor for WRS, arrived on site to begin response activities. A site meeting was held and objectives were laid out. First, EPA tasked WRS with stabilizing the site, to include moving and arranging the containers in an orderly fashion to promote rapid sampling, stabilizing and securing all containers, and securing all entrances to the building and repairing all large openings in the walls to keep out trespassers. Tetra Tech was tasked with documenting all site activities, providing air monitoring during all intrusive activities, cataloging all containers 5 gallons in size and larger, and collecting representative samples of each waste type.

Stabilization

WRS began stabilizing the site by moving all competent, transportable containers into the rectifier room (see Figure 2 and Photograph 15) where many of the containers were already sitting. WRS also began sorting the containers with guidance from START on how to arrange incompatible materials. While the bulk of the volume was contained in large containers 5 gallons and greater, there were several hundred smaller containers. Most were latex and oil-based paints, laboratory chemicals used in the quality-control process at the facility while it operated, household cleaners, lubricants, and several pesticide containers that primarily stored chlorpyrifos, which has been limited to agricultural use since 2001. Several 5-gallon buckets of lubricants and other flammable and combustible materials were segregated off to the side to prevent accidental mixing in case of a spill.

Due to the large amount of dust in the building and the assumption the chromium levels within it were high, WRS donned level C personal protective equipment (PPE). For the duration of the emergency response activities, Level C PPE was the minimum respiratory protection level used by both contractors during intrusive activities when dust could be generated.

Once the containers were moved, WRS gathered all the large debris and trash in the building and placed it into an unused area of the building. After samples from the vats had been collected, measurements were taken, and plywood and plastic covers were built and secured onto each vat. The rear wall of the building was extensively rebuilt, and two of the large sliding door entrances were shored with additional lumber and hardware.

Waste Sampling

Tetra Tech began sampling activities by donning level C PPE and numbering each vat. A total of 24 vats were cataloged. The vats were numbered sequentially, each number preceded with the letter “V,” as in “V-01.” Measurements of each were obtained, as well as depths of both liquid and solid waste. Using level C PPE and a combination of disposable transfer pipettes, glass drum thieves, and Containerized Liquid Waste Samplers (CoLiWaSa), Tetra Tech collected samples from each vat that contained waste and was safely accessible. Three vats were found empty. Another four vats proved inaccessible and no samples were collected from them. Tetra Tech collected a total of 17 vat samples, both solids and liquids. Where both were encountered in a single vat, only the liquid was sampled; the solid was assumed similar to the liquid fraction. The samples were placed into 8-ounce sample jars and stored on site until field hazard categorization tests could be performed.

After WRS brought the portable containers into the rectifier room (see Figure 2 and Photograph 15), they were grouped according to container type and labeling. Although each vat and 55-gallon drum received a unique number, the smaller containers were sorted and grouped by label. Container logs (See Appendix F) were developed for each unique number, which for the smaller containers frequently included two or more individual containers. Each drum or group of smaller containers was identified by the letter “D” preceding the unique sequential number assigned to each, as in “D-001.”

Based on discussions with OSC Garrard, Tetra Tech’s sampling strategy would be to open each container and perform a visual inspection. If the contents of each group appeared identical based on this visual inspection, portions of each container would be composited as a single sample. If they were not identical, a new container number would be assigned to the unique container, which would be sampled individually. For very large groups, half would be randomly chosen and sampled.

Tetra Tech entered the building in Level B PPE, opened every drum and container larger than 5 gallons, and collected samples. During all sampling activities, air monitoring for explosive atmospheres, carbon monoxide, hydrogen sulfide, oxygen levels, and VOCs was performed using a 5-gas meter. Tetra Tech

performed headspace readings on each container using the 5-gas meter. One container, D-031, indicated high VOCs. This container was then resealed to eliminate the hazard. Based on this information, the level of protection was downgraded to level C PPE. Tetra Tech then collected a sample of each drum or waste group, except in the case of what appeared to be properly labeled raw production materials. These were 17 fiber drums of solid powders, many of which were unopened. Tetra Tech opened them to confirm that they were production products in their original packaging and then reclosed them. Mr. Richards returned to the site later and confirmed that the fiber drums were properly labeled and the material inside was indeed as the label stated. Based on this information, it was considered unnecessary to sample the material because disposal could be designated based solely on generator knowledge. Tetra Tech collected a total of 51 samples from the drums and consolidated wastes. A total of 89 containers were logged. Although the numbers on the container log in Appendix F go to D-105, D-008 through D-0023 were absorbed into D-007 as a single group because all contained the same nickel plating solution. An additional 14 containers were not sampled for the following reasons: the container could not be opened, the contents could not be sampled, or the labels appeared to match the product and the container was obviously in its original packaging.

Tetra Tech and WRS conducted a battery of field hazard categorization tests on the collected samples. Based on knowledge of the plating process, discussions with the operator, and field experience, Tetra Tech and WRS recommended to OSC Garrard a limited suite of characterization tests, including water solubility, pH, and oxidizer. Mr. Richards stated that no cyanide plating processes had occurred at the facility, and VOC headspace readings indicated the only organic constituents at the facility as the segregated lubricants and contents of drum D-031. The results of the categorization tests are shown on the container logs in Appendix F. At WRS's request, EPA tasked Tetra Tech to submit the vat samples for laboratory analysis. The results appear in Appendix D.

By the close of business Thursday, November 20, 2008, WRS had completed securing the building and covering the vats to prevent rain infiltration. Tetra Tech had sampled all the large containers and obtained samples for laboratory analysis. OSC Garrard demobilized the site.

ENVIRONMENTAL SAMPLING ACTIVITIES

On December 16, 2008, OSC Jordan Garrard and Tetra Tech personnel Chuck Berry and Kyle Russell returned to the site. EPA Cost Recovery personnel also were on site to examine documents and records. The purpose of this site visit was to collect environmental samples and gauge any potential impacts to site soil and sediment.

The area south of the main building was divided into three sections, and 5-point composite samples of each were collected and identified as RP-SS-01, RP-SS-02, and RP-SS-03 (see Figure 3). An X-ray fluorescence (XRF) spectrometer was used to analyze soils at the rear of the building between the structure and the creek. Calibration checks performed that morning showed a nearly 100% overestimation of chromium content in the standard. However, the intent was to use the XRF unit as a screening tool only to collect the highest observed concentrations in soils at the rear of the building. Absolute values would be supplied by laboratory analysis. An area between a cylindrical concrete structure and the rear wall of the building showed XRF chromium levels of 536 parts per million (ppm) and was sampled as RP-SS-04. Sediment from the bank of the creek, where runoff from the stained concrete met the creek bank, registered XRF chromium levels of 2,012 ppm and was sampled as RP-SS-05. A sediment sample from just inside the stream channel was collected at this location as RP-SD-01. Two more sediment samples were collected at approximately 15-meter intervals downstream to the south: RP-SD-02 and RP-SD-03 (see Figure 3). An additional soil sample, RP-SS-06, was

collected from the area outside the southeast entrance to the facility where XRF analysis showed 6,183 ppm chromium in that soil.

In preparation for developing a health and safety plan to cover a potential removal action, Tetra Tech collected a sample of the dust in the building, RP-SS-07. XRF readings indicated 12,684 ppm chromium in this dust.

Realizing the water in the secondary containment would require disposal profiling, OSC Garrard tasked Tetra Tech to collect a composite sample, RP-CONT, from all three containment units.

On December 17, 2008, Tetra Tech used a concrete coring drill to core through the concrete at six locations throughout the building (see Figure 2). Samples were not collected at core locations 1, 2, and 3, all on the east side of the building, because gravel underlay the concrete to an unknown depth. Core 4 was sampled at both the top of the exposed soil (RP-CORE-4A) and at a depth of about 3 to 3.5 feet below the concrete, to correlate with the same elevation as the bottom of the secondary containment (RP-CORE-4B). Core 5, located nearly 8 feet higher than the bottom of the secondary containment, was sampled at the top of the exposed soil (RP-CORE-5A) to a depth of 0.5 feet below the surface, where auger refusal was met. No additional sample was collected at this location. Core 6 was drilled in the stripping room. This core contained only a small amount of gravel beneath the concrete, which Tetra Tech augured out, exposing soil at 1 foot below the concrete surface. A sample was collected here (RP-CORE-6A) and another (RP-CORE-6B) at 1 to 1.5 feet below the surface of the soil. Additionally, Tetra Tech collected a sample of the water within the secondary containment, RP-CONT, which was incorrectly identified at the laboratory as RP-COUNT. Tetra Tech has elected to carry this mistake through the entire data validation process to avoid confusion.

Prior to demobilization, Tetra Tech used the XRF unit to examine dust on various surfaces in the building including floors, walls, and equipment. Chromium readings ranged from 1,681 ppm to 40,988 ppm. Nickel concentrations ranged from 25,468 ppm to 118,804 ppm. These readings suggest dust control may be required during any subsequent activity within the building.

All samples were analyzed at Analytical Environmental Services in Atlanta, Georgia, for total Resource Conservation and Recovery Act (RCRA) metals and hexavalent chromium. Summary tables listing the positive detections are available in Appendix D, as well as complete laboratory data packages in Appendix E.

WASTE AND ENVIRONMENTAL ANALYTICAL RESULTS

Attached in Appendix D are summary tables showing the positive detections for each sample. The complete laboratory data validation reports for both the wastes and environmental samples are in Appendix E. Appendix F contains a container log which lists each container, the field hazard categorization test results, and a preliminary waste stream. Only characteristic waste is discussed below. Because no active wastewater treatment occurred at the facility, and no cyanide was used at the facility, no F-listed wastes are anticipated from the vats or the larger containers. The waste streams specified below are for planning purposes only. Final waste determination will be at EPA's discretion.

Waste Sampling Results

Based on the results of the field characterization testing and the laboratory analytical results, several vats exhibited characteristics of hazardous waste. Several vats exhibited the characteristic of corrosivity. Specifically, V-05 had a pH of 0.77, V-11 had a pH of 1.05, and V-17 had a pH of 1.17. Regulation at 40

Code of Federal Regulations (CFR) Part 261.22 define a waste as corrosive if the pH is below 2.0 pH units or greater than 12.5 pH units. No vat had a pH greater than 12.5.

Toxic Characteristic Leachate Procedure (TCLP) testing was not performed on any sample. RCRA disposal regulations, found at 40 CFR Part 262, indicate that for any liquid sample with less than 0.5% filterable solids, the liquid can be considered the TCLP extract, and total values can be used instead. These values are compared against the list given in 40 CFR Part 262.24, commonly called the “D-list wastes.” Assuming that all sampled material contains less than 0.5% filterable solids, 11 of the 17 sampled vats exhibited the characteristic of toxicity, specifically vats V-01, V-03, V-04, V-05, V-10, V-11, V-12, V-13, V-14, V-17, V-20, and V-22. The vats failed disposal requirements for a combination of arsenic, cadmium, chromium, mercury, and selenium. The attached tables in Appendix D list the results of the analyses. Results highlighted in light gray indicate potential hazardous waste if the material is less than 0.5% filterable solids, as described above.

If, however, the material is considered to have greater than 0.5% filterable solids, TCLP testing is required. On the tables in Appendix D, a darker gray is used to indicate material which returned total concentrations of filterable solids greater than 20 times the disposal limit for any analyte. This designation is based on the “Rule of 20,” which can be used to definitively exclude certain materials from failing the TCLP test, and is based on the nature of the TCLP test. The highlight indicates those materials at greater than 20 times the regulatory disposal limit, and thus may require TCLP testing to make a waste determination.

No suspended solids analyses have been performed, and it is unknown at this time if any of the vats contain greater than 0.5% filterable solids.

The sludges are discussed in terms of volume because no average density is available. In the above scenario, the following volume of wastes would be present in vats at the site:

<u>Waste Stream</u>	<u>Volume (in Gallons)</u>
Neutral, metal-contaminated liquids (hazardous)	2,479
Neutral liquids (non-hazardous)	3,331
Acidic, metal-contaminated oxidizing liquids (hazardous)	685
Neutral, metal-contaminated, oxidizing liquids (hazardous)	1,972
Acidic, metal-contaminated liquids (hazardous)	404
Neutral, metal-contaminated sludge (hazardous)	371
Acidic, metal-contaminated sludge (hazardous)	34
TOTAL VOLUME	9,276

An additional 356 gallons of solids and sludge remain to be sampled and analyzed due to accessibility issues.

Drummed and containerized wastes at the site similarly have not undergone TCLP analysis. If a removal action is performed at the site, this would assumedly occur after the individual small containers have been bulked together into larger containers. Therefore, Tetra Tech is not considering the toxicity characteristic when assessing the drummed wastes. Only pH, ignitibility, and oxidation reactivity are considered here. Future analysis will be required to fully characterize any wastes.

Based on the parameters given above, Tetra Tech estimates the following wastes are present at the site in drums and other small containers:

<u>Waste Stream</u>	<u>Quantity</u>
Acid liquids	90 gallons
Basic Liquids	188.8 gallons
Flammable Liquids	41.25 gallons
Neutral liquids	1,313.1 gallons
Oxidizing liquids	62.5 gallons
Nickel brightener	25 gallons
Nickel purifier	5 gallons
TOTAL VOLUME	1,726 gallons

Based on a 55-gallon container weight of 450 pounds (9 pounds per gallon), derived from the label on the nickel additive drums, the following solids are present at the site.

<u>Waste Stream</u>	<u>Quantity</u>
Nickel additive solid	8,415 pounds
Non-hazardous solids	20 pounds
TOTAL WEIGHT	8,435 pounds

Additionally, 10 containers (or container groups) could not be sampled due to accessibility issues. Also present at the site are an undetermined quantity of paint (oil-based and latex), dozens of small laboratory containers of various chemicals, several pesticide containers, cleaning products, and lubricants. Many of the containers, particularly the solid nickel additives, may have recycling or resale potential. Further investigation of this removal strategy is recommended.

Sample RP-CONT, taken from the secondary containment, showed no hazardous characteristics and is likely mostly rainwater infiltration from the damaged roof. An estimated 7,000 to 14,000 gallons of wastewater is present in the secondary containment, based on a 1- to 2-foot average depth.

Environmental Sampling Results

Tetra Tech collected six native soil samples, one interior dust sample, three sediment samples, and five core samples beneath the foundation. Each was analyzed for RCRA metals and hexavalent chromium. For soil samples, results were compared to the Region 4 Removal Action Levels (RAL) for industrial soil and the EPA 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSL) for worker exposure to industrial soil. Sediment samples were compared to the Region 4 Ecological Screening Values for Sediment (ESV). Trivalent chromium values were obtained by subtracting the hexavalent chromium values from the total chromium values. The resultant trivalent chromium values inherited any estimation qualifiers applied to any result included in the calculation. Because speciation was performed on the chromium, established protocol dictates consideration of the individual species of chromium rather than its total concentration.

No soil sample exceeded the Region 4 RALs for any analyte. Every sample exceeded the RSL for the cancer endpoint target level of arsenic (1.8 milligrams per kilogram [mg/kg]). Given the consistency and close range of values for arsenic returned from every soil and sediment sample (3.16 mg/kg – 11.5 mg/kg), arsenic likely is native to this area. Further investigation of this is recommended. Several samples exceeded the RSL for chromium of 498 mg/kg: RP-CORE-4A (1,310 mg/kg), RP-CORE-4B (4,230 mg/kg), RP-CORE-5 (1,780 mg/kg), RP-SS-04 (525 mg/kg), and RP-SS-07, dust from inside the building, (6,390 mg/kg). Sample RP-CORE-5 showed 276 mg/kg of hexavalent chromium, exceeding the industrial RSL of 71 mg/kg. No other RSLs were exceeded. Comparison between the laboratory results

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and the XRF field screening shows poor correlation, which confirms the field team's findings during the field calibration checks.

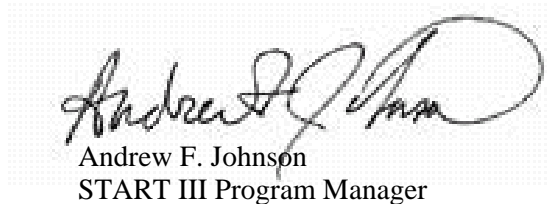
All 3 sediment samples exceeded an ESV for at least one analyte. RP-SD-01 contained 7.36 mg/kg exceeding the ESV for arsenic of 7.24 mg/kg. Two samples exceeded the ESV for total chromium of 52.3: RP-SD-01 (2,840 mg/kg) and RP-SD-02 (806 mg/kg). Sample RP-SD-03 exceeded the ESV for lead of 30.2 mg/kg with 442 mg/kg.

If you have any questions or need additional copies of this report, please call me at (678) 775-3098 or Brian Croft at (678) 775-3113.

Sincerely,



Charles Berry
START III Site Manager



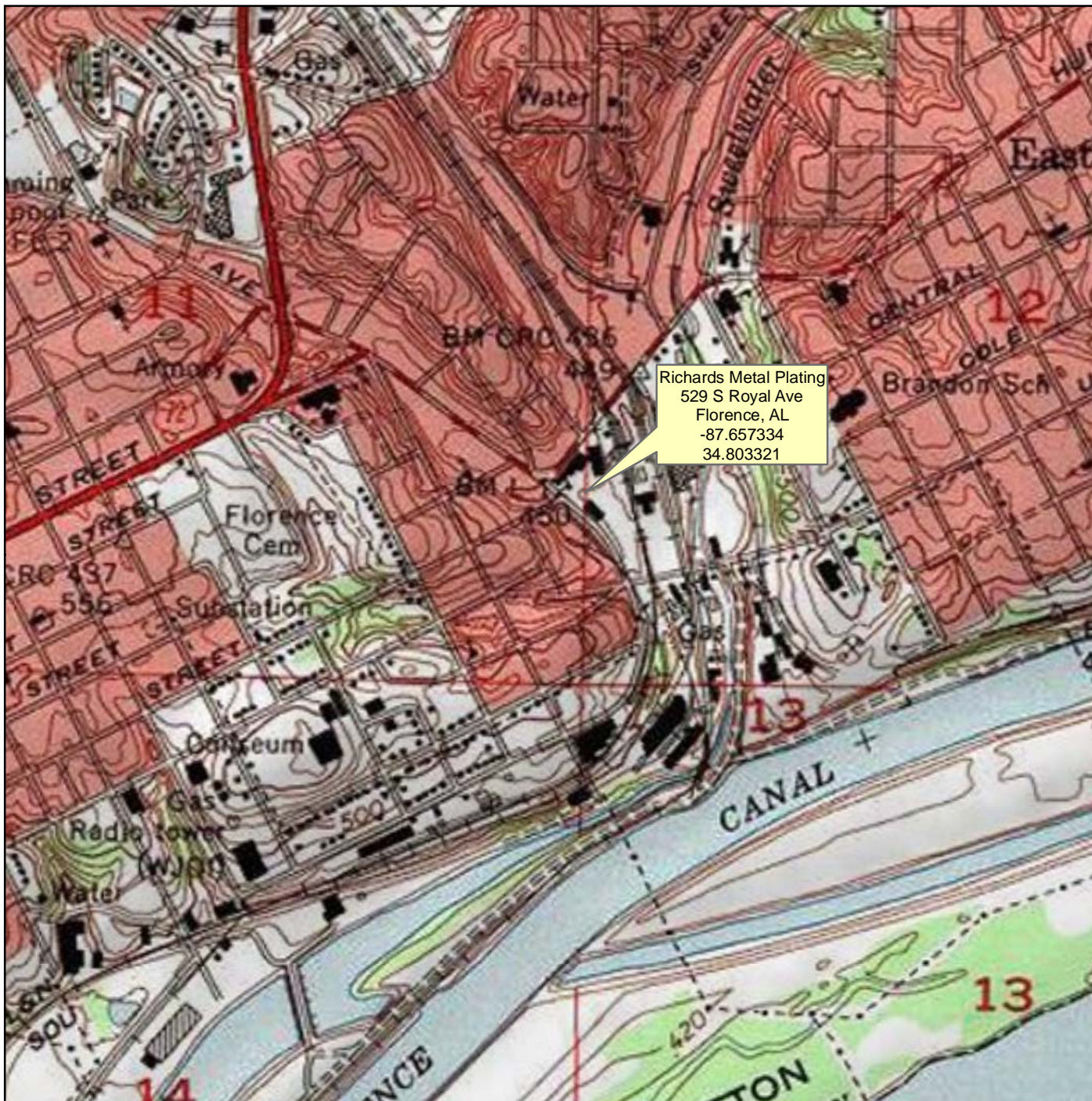
Andrew F. Johnson
START III Program Manager

Appendices (6)

cc: Katrina Jones, EPA Project Officer
Darryl Walker, EPA Alternate Project Officer
Brian Croft, START III Task Order Manager
Angel Reed, START III Document Control Coordinator

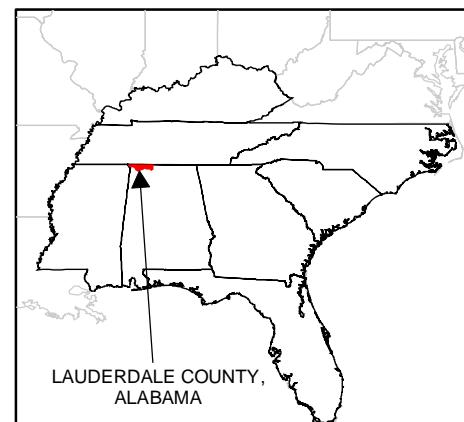
APPENDIX A

FIGURES (Three Pages)



0 500 1,000
Feet
1:12,000

MAP SOURCE:
USGS, FLORENCE, AL
TOPOGRAPHIC QUADRANGLE, 1972

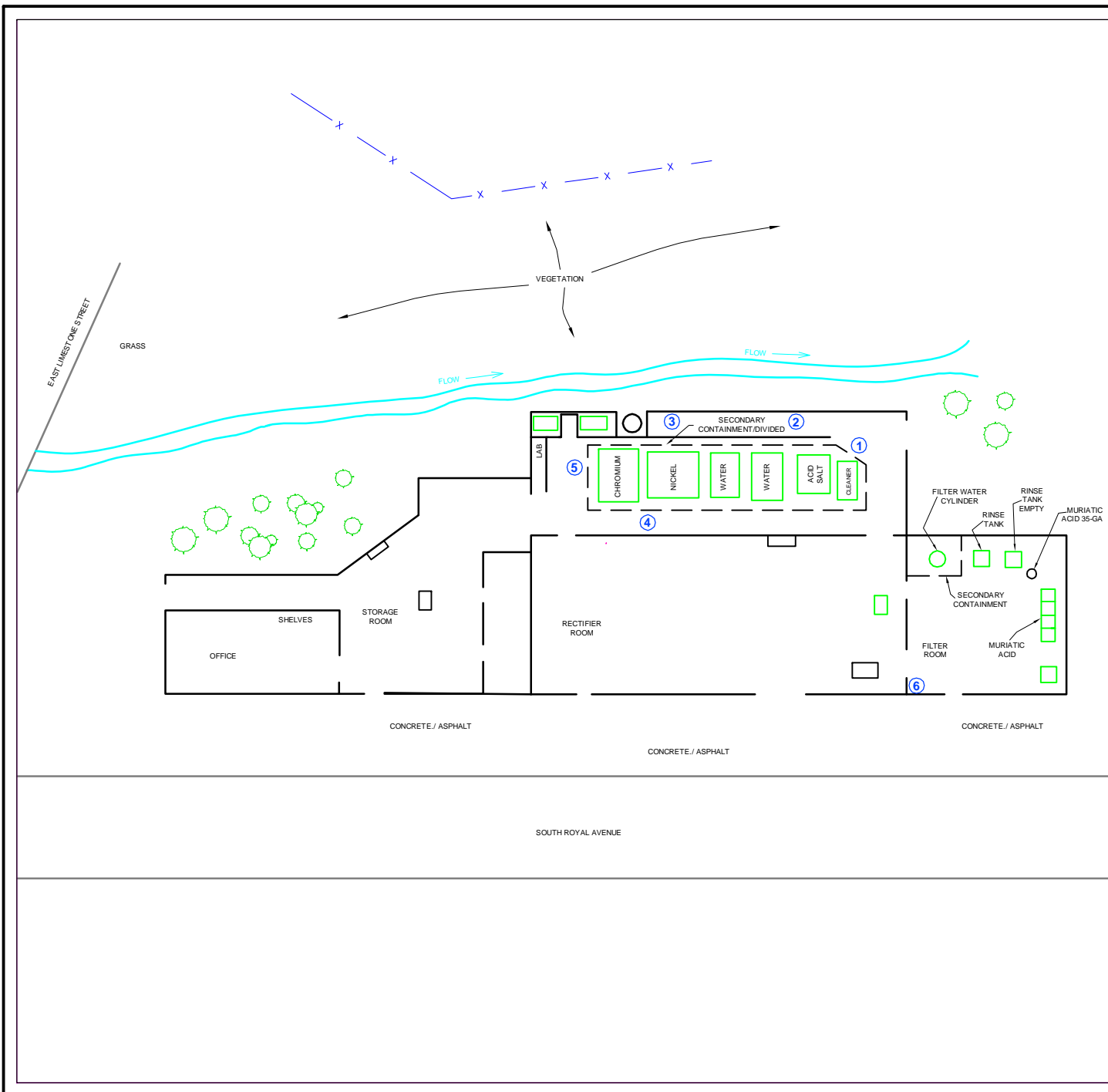


United States Environmental Protection Agency

RICHARDS METAL PLATING
FLORENCE,
LAUDERDALE COUNTY
ALABAMA
TDD No. TTEMI-05-001-0082

**FIGURE 1
SITE LOCATION**





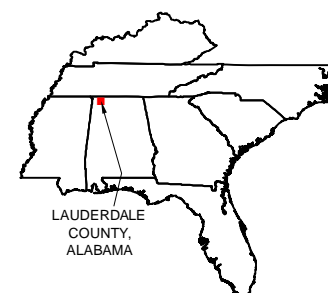
LEGEND

① Core Sample Location

□ Vat



NOT TO SCALE

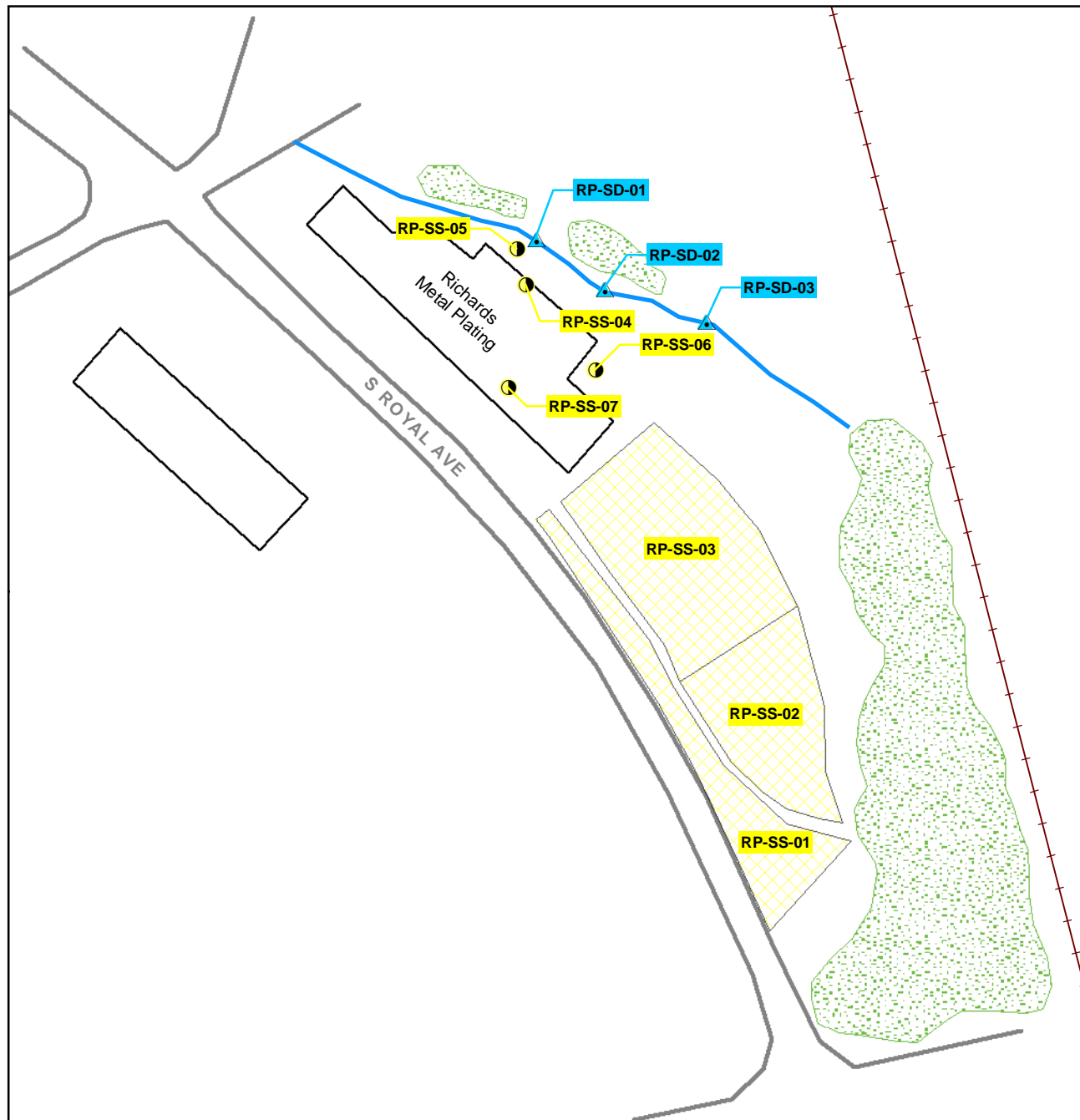


United States Environmental Protection Agency

RICHARDS METAL PLATING
FLORENCE,
LAUDERDALE COUNTY
ALABAMA
TDD No. TTEMI-05-001-0082









**FIGURE 2
SITE LAYOUT**





LEGEND

Sampling Locations

-  Sediment
-  Surface Soil
-  Soil Sampling Area
-  Railroad
-  Drainage Feature
-  Wooded Area
-  Structures
-  Road Outline

0 50 100
Feet
1:1,200



United States Environmental Protection Agency

RICHARDS METAL PLATING
FLORENCE,
LAUDERDALE COUNTY
ALABAMA
TDD No. TTEMI-05-001-0082

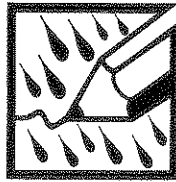
FIGURE 3
SOIL AND SEDIMENT
SAMPLE LOCATIONS



APPENDIX B

LOGBOOK NOTES (Fourteen Sheets)

Richards Plating



"Rite in the Rain"®

ALL-WEATHER

JOURNAL

No. 391

11/6/8

1230 START Barry arrives at
529 South Royal Ave, Florence, AL.
at the Richards Plating site.
Met by OSEs Jordon Garrard &
Jeff Crowley.

Also on site is Mr. Barry Billy
Richards, owner.

1300 Bonnie Temple & Dave Davis ADEM
arrive on scene. Mr. Richards is
inside opening doors for lights

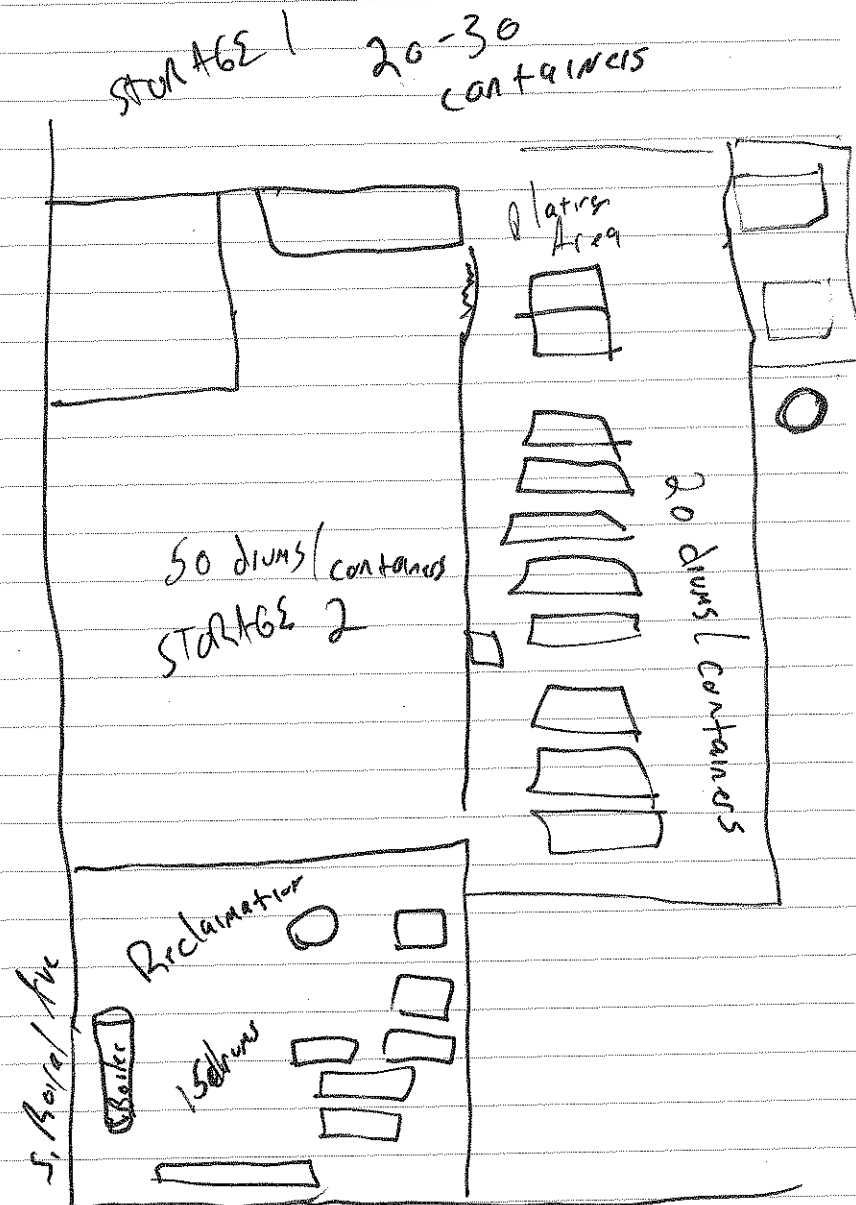
Plating Line

- 10 Vats 2 appear empty. 2 ndary
centrum full of water & debris
- 5 middle Vats not accessible
unless gangway is repaired.
- building is structurally unsound

Storage Area 1

Main entranceway. Building in
good shape here. Few containers
located here. Mostly brighteners
& finishes. 3 drums Alum

com



Storage Area 2

~ 50 drums + other containers
 building in ~ shape.
~~Many~~ Many containers are empty
 Various types of contents
 acid/base, brighteners, polishers
 solid/liquid

Reclamation

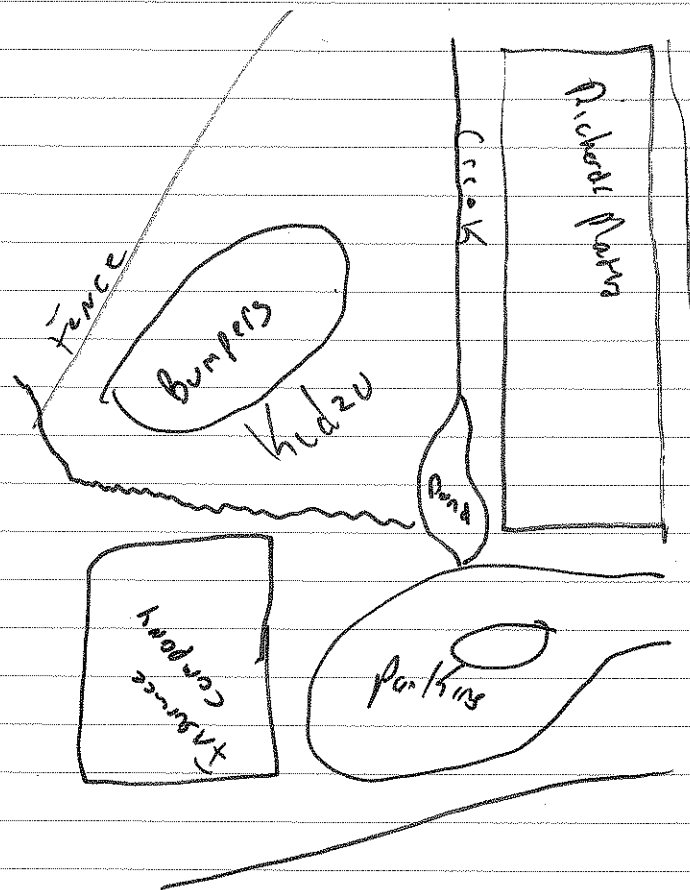
7 vats + 1 tank.

- Removed chrome from
 used bumpers prior to
 replating.

~ 15 drums (25-55 gal)
 strewn throughout, most
 w/ corrosive/toxic labels

Bumper Area ~ 1/2 acre of
 various bumpers engulfed by
 large Kudzu patch.

CMH



CMH

11/18/08

0730 START Berry & Russell arrive onsite

EPA, USES, WRS, START have meeting safety

Today's activities

- Set up staging
- Move containers to a staging area
- Containers will be in "Like" chemicals
- Set up waste stream

0800 START will handle all drum documentation

0830 USES makes entrance into building to begin categorizing & setting up staging area

Weather for today is cold high around 40°F. Winds 10-15 out of west.

Clear sky.

USES continues to move drums and containers for easier access

0920 EPA and START walk through building to make Air monitor analysis
PID 0.0 H₂S 0.0 LEL & CO & O₂ 20.91030 START will make an ~~entrance~~ entrance to label drums

1130 START exits building. Labeled 22 Vats inside, 2 of which are located outside in back of building. Two more vats are located in building along plating line but could reach because of unknown stability of the floor. Tetra Tech will go back in after lunch and label Drums

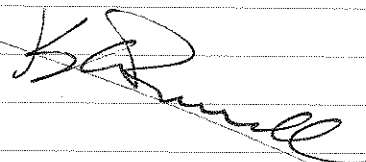
1300 START goes back in to label more drums and air monitor

1500 START exits for a break. Labeled drums and Documented on sheets what's on drum labels

1600 START exits building. Went in around 1515 to finish bulking containers together.

1630 START offsite to drive home to Huntsville

1800 Made it home to Huntsville



11/18/08

0500 left huntsville to head to
Richards Plating site.

0650 made it on site. START Russell
and WRS + USES on site.

0700 START Berry on site.

weather is clear today. 29° now. Highs
in mid 50°s. Winds calm.

0710 START, EPA, WRS, USES go over
safety meeting.

0720 START, EPA walkthrough
building.

0815 START enters to place jars by vats

0905 START enters to sample vats

1000 START comes out of building
after sampling vats

1300 START went in to label lots of
containers

1341 START came out and went back
in lay out jars.

START Russell stayed onsite during
lunch to watch site. Ate onsite.

1400 START goes in to start sampling
unknown drums. All doc in sheets

All solid drums are still in original packing
assume label is right.

11/19/08

1530 START exits building

1545 START reenters to sort out
unknown chemicals, Flammables, & house
hold cleaners.

1630 START exits & START Russell is
off site to head home

~~1645~~ ¹⁶¹⁵ START Russell makes it home

SEP Russell

11/20/08

0500 START Russell leaves Huntsville
to head to Florence

0700 START Russell makes it on site
weather today is clear with calm winds.
High around 50°-55°

0810 had safety meeting to cover
days activities

START will enter in level B with
one USES for backup.

open all doors

monitor for volatiles, if clear
downgrade to C.

set up hazcat then sample in
level C and hazcat each chamber
to develop waste stream

915 Leon Kilburn & Mr. Richards
are on site. Mr Kilburn is looking
at equipment he may take. He is in
the plating business. All black poly
doors are Nickel solution, stainless
steel door is full of hydrogen peroxide
Filter plates, 3 filter, 2 Marx Valves,
hoses, 3 buffers, V-17 Vat
V-09 Vat, Air Blower

731-632-0481 Leon Kilburn
Kilburn

All cleaners, sanding belt idler,
Muriatic acid, Drum of
B. Buffing compound, Nickel
Compound, titanium heating coils
heating elements in chrome tanks
PH meters, buffer wheel, sanding
paper, Filter pads, chrome checker
Blower Fan

~~1100~~ START exits and goes to lunch
START Russell stays and watches
site

1200 START & USES goes in level
B and opens doors & samples
all doors.

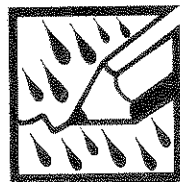
1300 START & USES exits building
1330 START & USES return inside
building to finish collecting
samples from lots. WRS & START
Hazcat samples.

1400 START & USES finish sampling
and EPA & START take Scott Tanks
to fire dept to fill

1500 START will go back in to collect
rest of sheets

1540 Hazcat complete

START will send off vat samples
for RCRA metals, Comstock
Flash.



"Rite in the Rain"®

ALL-WEATHER
JOURNAL

No. 391

12/16/08

0700 START Berry & OSC Gerard
ON site. Open building &
set up lighting for cost Recovery
Group to resume examination of
company records.

0730 Plan out sample collection
& locations.

0745 WEATHER Cold & Rainy.
Rain expected on & off all day,
High around 45. Currently 35
with moderate shower.

- START off site to buy additional
screws to resecure building doors.

0830 START back at site.

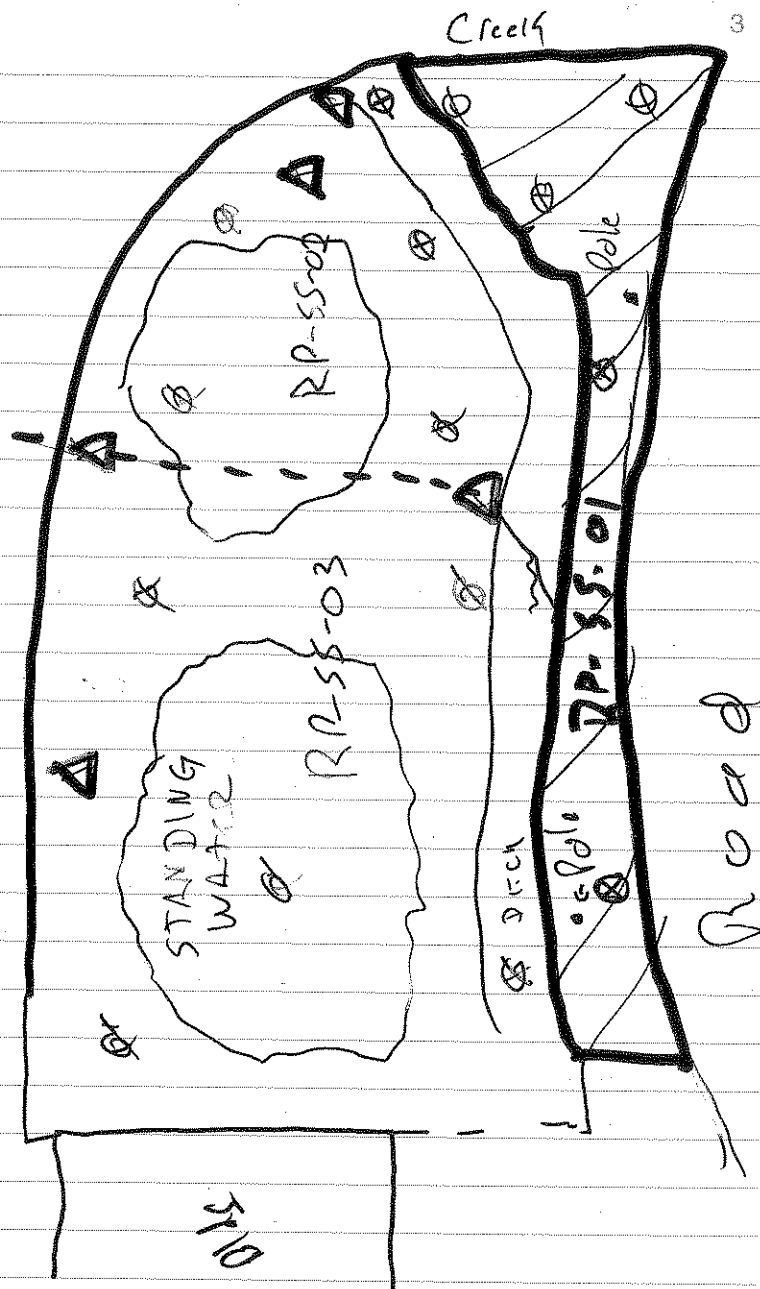
0850 RP-SS-01 collected from area
between ditch & road. 5pt comp.

0900 RP-SS-02 collected. K Russel
Arrives on site w/ core drill.

0915 RP-SS-03 collected.

0940 START begins cal check &
warm-up of Niton. Although the
soil is too saturated for
definitive use of XRF, it can
still be used for strict
screening

can



12/16/08

0930 S.O. blank ND for As, Cr, Ni, Pb

1000 RCRA metals

As = ~~71.9~~ 456.3 \pm 38.4Cr = 943.8 \pm 227.6Ni = ND < 188 \pm 125.6Pb = 410.6 \pm 37.2

All expected values for RCRA

Standard 500 ppm for Pb, Se, As, Cr

1020 Till-4

Standard

As = 105.3 \pm 17.8 | 111Cr = 28.6 \pm 140.6 | 53Ni = 73.6 \pm 16.1 | 17Pb = -42.2 \pm 107.3 | 50

1030 #4 taken in dust by steps in

Boiler room

#5 taken in

#11 disregarded because time laps

1100 RP-SS-04 collected

1105 RP-SS-05 collected

1115 RP-SD-01 collected

1130 START offsite for lunch

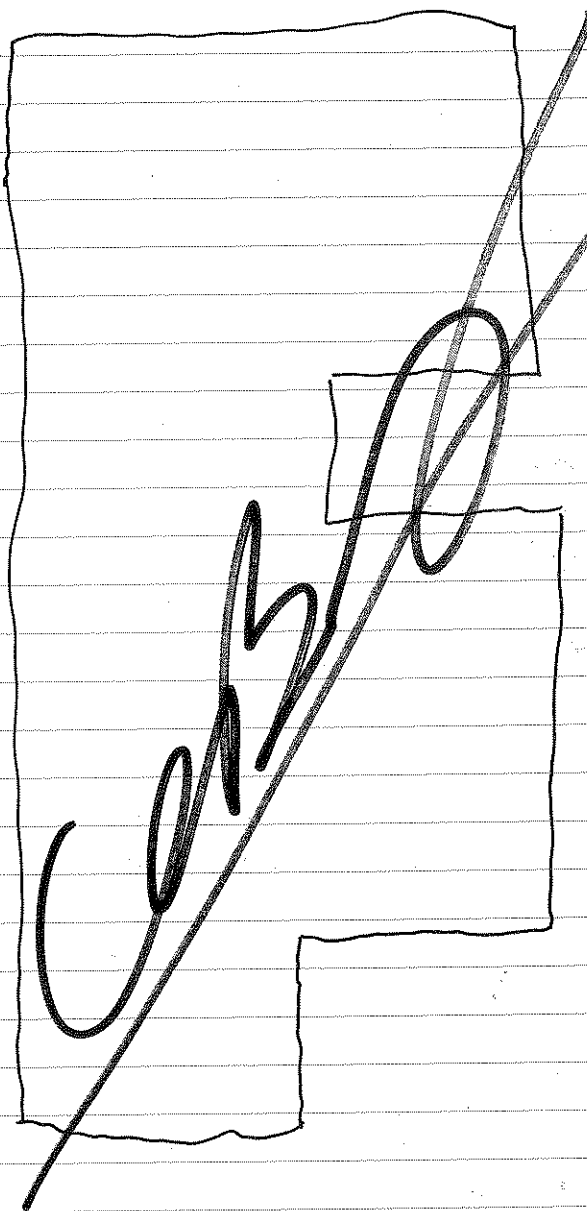
1205 Return to site START bag & hot

retrieving FedEx package: Dosimeter.

1230 start Russell off site to purchase

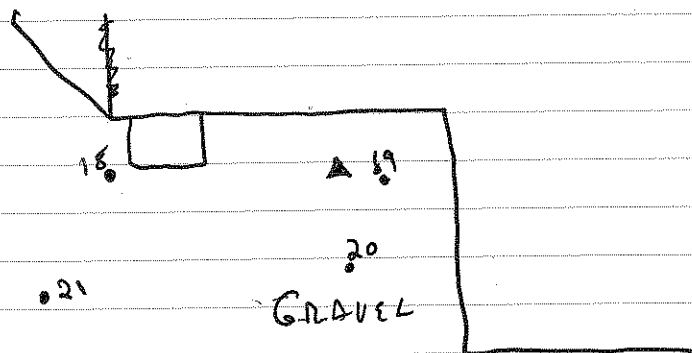
add'l hose for core drill.

CERN



12/16/08

- 1320 Water supply line for core drill set up. OSC Gernard is attempting to contact the city about turning on the water @ the hydrant. They originally agreed to have it installed by 1200.
- 1330 XRF on rear corner of bldg



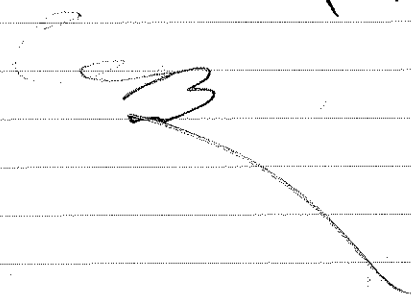
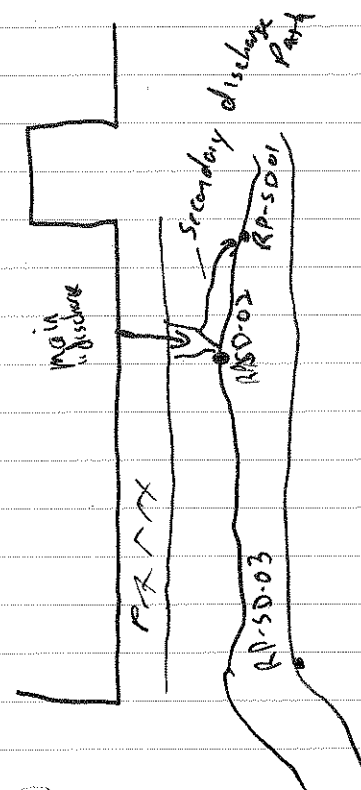
* LATE ENTRY *

- 1255 START collects RP-SD-02 from creek @ main "discharge" point
- 1305 START collects RP-SD-03 from sand bank 50' down from main "discharge"

C. J. [signature]

12/16/08

Sed Sample Locations



12/16/08

1340 Collect RP-SS-06 from
XRF location 19. —

1355 Collect RP-SS-07 from
XRF location #5. Dust
in the Chrome stripping
room next to the stairs

1430 Collect RP-CONT. A
Composite water sample
from the 3 secondary
containments, flooded.

Preserved to <2.0 pH w/nitric acid
-will analyze for metals only.

1500 K. Russell off site to return
core bits to vendor + get
the right one. —

-OSC Gerard + START Berry at
Florence Water Dept. Installer is
off today, but we can pick up
our own at the yard. —

1530 Gen meter. —

1540 Hydrant + meter work. Need
couplings to get to garden
hose thread. —

1700 The thread on the meter cannot
be matched, and we cannot

CERS

12/16/08

1700 (cont) remove the bushing
ourselves. Will return the
meter to the water department
tomorrow + see if they can
remove/replace the coupling.
- off site for the day

CERS

12/17/08

0700 Ciberny + OSC Garrard depart
for water dept

0730 Return Distribs to Louie's.

0745 ON site. /K. Rosso // ON site
w/ core drill.

- Start setting up.

1000 Begin Core #1

1015 Core 1 is $\approx 8"$ of unreinforced concrete
and gravel beneath. Gravel is hard-dry
another 6", but no bottom found.

1030 Core 2 same as #1

1045 Core 3 same

1115 Core 4 erupted red mud when it broke
through. although there is some gravel,
we will try to auger through after
lunch.

1200 Return to site. Cost Recovery group is
finished and have left the site.

1230 Collect RP-Core ~~5A~~ from Core 5.
8" concrete 3" gravel + then thick red
clay, saturated @ $\approx 1.5'$ bgs. Collect
5A from top of soil to (11" bgs) to
1.5' bgs.

1245 Collect RP-Core ~~5B~~ from $\approx 3-3.5$ ft
below concrete surface. This depth

cor

12/17/08

1245 (cont) is at the same depth as
the bottom of the 2ndary containment.

1320 Complete Core 5. RP-Core 5A is
collected from the top of the red
soil immediately below 6" of
concrete. Very compact.

1335 Cannot auger below 1.5' at
Core 5. Thick clay mixed with
gravel leading to auger refusal.

1345 ADEM representatives on site
Bonnie Temple + Dylan Wysocki

1400 START performs gross Dron
of sampling equipment.

1445 START performs XRF analysis of
concrete floors. Stained areas
of stripping room range from ~~3K30,000~~
3K-30K, μ ; from 17K \rightarrow 89K.

- Chromium 'in dust at 30K range
also noted in drum storage
area. H+S protocol altered to
mandate boot covers.

1515 Collect RP-Core 6A from stripping
room. 6" of concrete underlain by 6"
per gravel + then red soil. 6A collected
from 1-1.5' below concrete surface.

cor

12/17/18

- 1520 Collect RP-Core 6B from
2-2.5' below concrete surface
- 1525 Cleaning up for demobilization
- 1600 K. Russell off site, START Berry
updating logbook. —
- 1620 Start Berry off site. —
Samples will be hand-delivered
to AES tomorrow. —

APPENDIX C

PHOTOGRAPHIC LOG (Nineteen Pages)



OFFICIAL PHOTOGRAPH NO. 1
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: South

Date: November 11, 2008

Photographer: Chuck Berry, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: The facility's former operator, Mr. Billy Ray Richards, explaining the plating process to Alabama Department of Environmental Management (ADEM) officials.





OFFICIAL PHOTOGRAPH NO. 2
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: East

Date: November 11, 2008

Photographer: Chuck Berry, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: The flooded secondary containment surrounding the chromium plating line.





OFFICIAL PHOTOGRAPH NO. 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: East

Date: November 11, 2008

Photographer: Chuck Berry, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Acid wash and neutralizing tanks in the chromium plating line.





**OFFICIAL PHOTOGRAPH NO. 4
U.S. ENVIRONMENTAL PROTECTION AGENCY**

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	North	Date:	November 11, 2008
Photographer:	Chuck Berry, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Overview of the chromium plating line.		





**OFFICIAL PHOTOGRAPH NO. 5
U.S. ENVIRONMENTAL PROTECTION AGENCY**

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	East	Date:	November 11, 2008
Photographer:	Chuck Berry, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Debris floating in the flooded secondary containment surrounding the chromium plating line.		





OFFICIAL PHOTOGRAPH NO. 6
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: South

Date: November 11, 2008

Photographer: Chuck Berry, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Chemicals stored in the chromium plating area.





OFFICIAL PHOTOGRAPH NO. 7
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	Not applicable (NA)	Date:	November 6, 2008
Photographer:	Chuck Berry, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Damaged fiber drum leaking material onto the floor.		





OFFICIAL PHOTOGRAPH NO. 8
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	NA	Date:	November 11, 2008
Photographer:	Chuck Berry, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Open container of nickel plating solution floating in the secondary containment.		





OFFICIAL PHOTOGRAPH NO. 9
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: East

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: WRScompass (WRS) personnel segregating trash and debris.





OFFICIAL PHOTOGRAPH NO. 10
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	South	Date:	November 25, 2008
Photographer:	Chuck Berry, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Open vat with unknown liquid. Note the lack of freeboard and the collapsed tarp.		





OFFICIAL PHOTOGRAPH NO. 11
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-001-0082	Location:	Richards Metal Plating
Orientation:	NA	Date:	November 25, 2008
Photographer:	Kyle Russell, Tetra Tech	Witness:	Jordan Garrard, USEPA
Subject:	Typical drum of unknown liquid.		





OFFICIAL PHOTOGRAPH NO. 12
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: NA

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: One of several dozen 15-gallon drums. All were labeled "Muriatic Acid" but were found to contain a nickel plating solution.





OFFICIAL PHOTOGRAPH NO. 13
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: NA

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Typical fiber drum. Most of these drums contained unused finishing and polishing products. Based on conversations with the former owner, the labels of each were accepted as accurate and the drums were not sampled.





OFFICIAL PHOTOGRAPH NO. 14
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: East

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Metal vats on the chromium plating line in disrepair. Note the standing water in the secondary containment.





OFFICIAL PHOTOGRAPH NO. 15
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: South

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Overview of a portion of the accumulated containers. The small containers in the foreground were not sampled during this event. Most are some form of paint, either latex or oil-based.





OFFICIAL PHOTOGRAPH NO. 16
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: NA

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Miscellaneous drums grouped by type.





OFFICIAL PHOTOGRAPH NO. 17
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation: NA

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Empty containers segregated and stacked in the stripping room.





OFFICIAL PHOTOGRAPH NO. 18
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation:

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Sample materials from drums and vats undergoing field hazard categorization tests.





OFFICIAL PHOTOGRAPH NO. 19
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-001-0082

Location: Richards Metal Plating

Orientation:

Date: November 25, 2008

Photographer: Kyle Russell, Tetra Tech

Witness: Jordan Garrard, USEPA

Subject: Tetra Tech personnel assisting WRS personnel in field hazard categorization tests of materials collected from drums and vats.



APPENDIX D

SUMMARY ANALYTICAL TABLES (Four Pages)

TABLE 1
ANALYTICAL RESULTS FOR WASTE SAMPLES
RICHARDS METAL PLATING RESPONSE

Sample Designation:	V-01	V-03	V-04	V-05	V-10
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/L	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	0.25 U	16.7 U	46.5 U	4.5 U	5.32
Barium	0.42 J	70.9	4.65 U	4.5 U	4.1 U
Cadmium	0.02 U	1.67 U	23.3 U	2.92	2.05 U
Chromium	52.0	1550	4.31	10300	3720
Lead	25.2	334	46.5 U	103	4.1 U
Mercury	0.0040 U	0.03 J	0.10 U	0.010 J	0.10 U
Selenium	0.10 U	3.62	5.19	4.5 U	4.1 U
Characteristic Parameters					
Corrosivity (pH Units)	9.81	5.95	9.50	0.77	3.10
Reactive Sulfide (mg/kg)	100 U	100 U	401	100 U	100 U

Sample Designation:	V-11	V-12	V-13	V-14	V-17
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	134	38.8 U	26.6 U	75.8 U	2.59 U
Barium	89.9	3.88 U	2.66 U	3.79 U	2.59 U
Chromium	120000	28.5	1.44	2.04	75.2
Lead	11.4	38.8 U	26.6 U	75.8 U	2.85
Selenium	4.47 U	4.56	2.66 U	4.68	2.59 U
Characteristic Parameters					
Corrosivity (pH Units)	1.05	5.83	5.88	5.68	1.17

Sample Designation:	V-18	V-19	V-20	V-21	V-22
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Chromium	2.61	1.63 U	1.69 U	1.45 U	317
Mercury	0.10 U	0.05 J	5.41	0.10 U	0.010 J
Characteristic Parameters					
Corrosivity (pH Units)	10.4	10.2	6.75	4.03	3.81

Sample Designation:	V-23	V-24	RP-COUNT
Sample Collection Date:	18-Nov-08	18-Nov-08	16-Dec-08
Hexavalent Chromium			mg/L
Hexavalent Chromium	NA	NA	0.002 UJ
Metals	mg/kg	mg/kg	mg/kg
Chromium	1.75 U	1.75 U	3.4
Mercury	0.030 J	0.14	0.0099 U
Characteristic Parameters			
Corrosivity (pH Units)	6.21	6.26	NA

Notes:

Indicate potential hazardous waste if the sample is less than 0.5% filterable solids, by weight.

Indicates the returned value is greater than 20 times the regulatory disposal limit for hazardous waste.

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria.

NA = Not analyzed

TABLE 2
ANALYTICAL RESULTS FOR ENVIRONMENTAL SAMPLES
RICHARD'S METAL PLATING RESPONSE

Sample Designation:	Industrial	Industrial	RP-CORE-4 A	RP-CORE-4 B	RP-CORE-5 A	RP-CORE-6 A	RP-CORE-6 B
Sample Collection Date:	RSL	RAL	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Percent Moisture							
Percent Moisture	NE	NE	22.8	28.4	28.4	19.1	30.8
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	25.7 J	34.9 J	276 J	0.766 J	1.45 UJ
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	7.40	7.79	11.5	4.96	9.73
Barium	100,000	681,000	49.4	64.4	47.3	158	91.5
Cadmium	564	2,700	3 U	2.84 U	2.81 U	82.9	1.18 J
Chromium	498	154,000	1310	4230	1780	81.3	49.3
Chromium (III)	100,000	154,000	1284.3 J	4195.1 J	1504 J	80.534 J	49.3
Lead	800	800	14.1	28.4	14.2	127	273
Mercury	340	93	0.0710 J	0.0734 J	0.0686 J	0.0849 J	0.165
Silver	5,677	17,000	0.150 J	0.193 J	1.11 J	1.89 J	0.0700 J

Sample Designation:	Industrial	Industrial	RP-SS-01	RP-SS-02	RP-SS-03	RP-SS-04
Sample Collection Date:	RSL	RAL	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Percent Moisture						
Percent Moisture	NE	NE	29.9	32.0	35.6	19.5
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	1.37 UJ	1.36 UJ	1.30 J	42.6 J
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	8.33	6.77	5.42	4.40 J
Barium	100,000	681,000	108	44.6	49.5	67.1
Cadmium	564	2,700	0.274 J	0.164 J	0.264 J	0.896 J
Chromium	498	154,000	20.7	40.2	308	525
Chromium (III)	100,000	154,000	20.7	40.2	306.7 J	482.4 J
Lead	800	800	145	44.9	158	35.6
Mercury	340	93	0.238	0.144 U	0.151 U	0.123 U
Selenium	5,677	17,000	0.781 J	4.41 U	0.402 U	0.373 U
Silver	5,677	17,000	3.18 U	2.21 U	0.0266 J	0.239 J

Notes:

Indicates detection at level exceeding the RSL

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

RAL= EPA Region 4 Removal Action Level

RSL= EPA 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria

TABLE 2
ANALYTICAL RESULTS FOR ENVIRONMENTAL SAMPLES
RICHARD'S METAL PLATING RESPONSE

Sample Designation:	Industrial	Industrial	RP-SS-05	RP-SS-06	RP-SS-07
Sample Collection Date:	RSL	RAL	16-Dec-08	16-Dec-08	16-Dec-08
Percent Moisture					
Percent Moisture	NE	NE	20.4	24.6	9.16
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	2.12 J	1.33 UJ	7.33 J
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	3.97 J	4.96 J	7.21
Barium	100,000	681,000	49.3	59.2	98.0
Cadmium	564	2,700	0.163 J	0.554 J	0.100 J
Chromium	498	154,000	137	168	6390
Chromium (III)	100,000	154,000	134.88 J	168	6382.67 J
Lead	800	800	89.8	107	361
Silver	5,677	17,000	2.47 U	2.99 U	0.361 J

Notes:

Indicates detection at level exceeding the RSL

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

RAL= EPA Region 4 Removal Action Level

RSL= EPA 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria.

TABLE 3
ANALYTICAL RESULTS FOR ENVIRONMENTAL SAMPLES
RICHARD'S METAL PLATING RESPONSE

Sample Designation:	Sediment	RP-SD-01	RP-SD-02	RP-SD-03
Sample Collection Date:	ESV	16-Dec-08	16-Dec-08	16-Dec-08
Percent Moisture				
Percent Moisture	NE	11.1	15.8	18.8
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	NE	54.3 J	0.0950 J	1.21 UJ
Metals		mg/kg	mg/kg	mg/kg
Arsenic	7.24	7.36	3.27 J	3.16 J
Barium	NE	30.3	65.0	32.3
Cadmium	1	0.160 J	0.0994 J	0.156 J
Chromium	52.3	2840	806	44.2
Chromium (III)	NE	2785.7 J	805.905 J	44.2
Lead	30.2	27.2	215	442
Mercury	0.13	0.112 U	0.116 U	0.209
Selenium	NE	4.46 U	5.55 U	5.26 U
Silver	2	0.0335 J	2.77 U	2.63 U

ESV

ESV = EPA Region 4 Ecological Screening Value for Sediment

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

NE= Not established

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria.

APPENDIX E

DATA VALIDATION REPORTS (Forty-eight Pages)



February 9, 2009

Mr. Jordan Garrard
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, GA 30303

Subject: Richards Metal Plating Response Site
Technical Direction Document Number TTEMI-05-001-0082
Contract No. EP-W-05-054 (START III Region 4)
Cursory Data Validation Report
Analytical Environmental Services, Inc., Report No. 0811F46
Analytical Parameters: Total Resource Conservation and Recovery Act (RCRA)
Metals, Toxicity Characteristic Leaching Procedure (TCLP) Metals,
Ignitability, pH, Reactive Cyanide, and Reactive Sulfide

Laboratory Report No.:	0811F46
Samples:	V-01, V-03, V-04, V-05, V-10, V-11, V-12, V-13, V-14, V-17, V-18, V-19, V-20, V-21, V-22, V-23, and V-24
Field Duplicate Pairs:	None
Field Blanks:	None

Dear Mr. Garrard:

The Tetra Tech Superfund Technical Assessment and Response Team (START) conducted data validation on the analytical results for seventeen waste samples that were collected at the Richards Metal Plating Response Site in Florence, Alabama, on November 18, 2008. The samples were analyzed under laboratory report number 0811F46 by Analytical Environmental Services, Inc. (AES), of Atlanta, Georgia. The samples were analyzed for total RCRA metals by SW-846 Methods 6010B and 7471A; TCLP metals by SW-846 Methods 1311, 6010B, and 7470A; ignitability (flash point) by SW-846 Method 1010; pH by SW-846 Method 9045D; reactive cyanide by the method of Section 7.3.3.2 of SW-846; and reactive sulfide by the method of Section 7.3.4.2 of SW-846. Sample V-01 was analyzed for TCLP metals and all other samples were analyzed for total metals. The ignitability test was omitted for sample V-12 due to insufficient volume.

Analytical data were evaluated in general accordance with applicable data validation guidance documents, including the following: the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines (NFG) for Inorganic Data Review (EPA October 2004). The analytical methods used by AES during this project provide guidance on procedures and method acceptance criteria that, in some areas, differ from the NFGs. Where the methods and the NFGs differ, the data validators followed the acceptance criteria in the methods. In addition, if laboratory-derived acceptance criteria were presented in the AES data packages, then these criteria were used to evaluate the data, unless the criteria were considered inadequate.

Data were evaluated based on the following criteria:

- Data Completeness *
- Sample Preservation, Sample Receipt, and Holding Times

- Laboratory Blanks *
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Laboratory Control Samples (LCS) and Laboratory Control Sample Duplicates (LCSD) *
- Dilution and Reported Detection Limits
- Analyte Quantitation *

* All QC criteria were met for this evaluated parameter. Those criteria without an asterisk (*) displayed a deficiency that is described later in this report.

The following efficient and effective data validation approach was used for providing an abbreviated assessment of the quality of the set of data. Data evaluation consisted of a review of the data with a focus on the available review parameters present in the summary data package (which typically does not include the raw data). This review was not a complete assessment of all possible quality control parameters or even of each quality control parameter that was reviewed. The review, rather, was intended to efficiently identify and focus on those problems and quality control deficiencies that could be readily identified from the summary data package. Because of the nature of this approach, some problems and deficiencies may not have been identified; as such, this approach may not support some critical uses and required limits on decision-making uncertainty for the data.

Enclosure 1 presents copies of the sample results sheets from the laboratory data package, with hand-entered qualifications from the data validation effort. Enclosure 2 presents the same data validation-qualified analytical results in table format.

SAMPLE PRESERVATION, SAMPLE RECEIPT, AND HOLDING TIMES

The samples were received at the laboratory, 6 days after collection, at ambient temperature. They were analyzed for ignitability and for mercury on the 14th day after collection. There are no official preservation and holding time requirements for ignitability. However, the compounds that typically contribute to a low flash point are volatile organic compounds (VOC), so the preservation and holding time requirements for VOC are considered to be applicable to ignitability. While the VOC holding time limit was (barely) met, the waste samples should have been refrigerated from collection until analysis. Due to the inadequate preservation (cooling), the ignitability results were considered estimated (flagged "J") and may be biased high in all samples. The mercury analysis was performed well within its holding time requirement of 28 days. Mercury has the same preservation by cooling requirement as VOC, which is intended to minimize loss of elemental mercury. Outside of fluorescent bulbs, chloralkali cells, other electrical equipment, some barometers and thermometers, and dental amalgam, mercury is generally found in ionized forms (inorganic or organic), which are not volatile. Since these samples came from abandoned waste in a metal plating shop, the mercury is almost certainly ionized. Even if it were originally elemental, elemental mercury in aqueous media is soon oxidized to an ionic compound. Therefore, the mercury results were not qualified.

MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD)

The MS/MSD analyses were performed on a sample from another site (for the TCLP analyses) and on sample V-03 (for total metals). Recoveries for chromium and lead from the total metals analysis could not be determined because the unspiked sample contained much more of those metals than the spike concentrations. No qualifications are warranted for this data gap. All other recoveries and all RPD results were within the specified control limits, so no qualifications are warranted.

Mr. J. Garrard
February 9, 2009

DILUTION AND REPORTED DETECTION LIMITS

One-to-four metals in eleven waste sample extracts were re-analyzed at a dilution to bring the results within the linear range of the analytical instrument. The dilutions ranged from two-fold (arsenic in sample V-21) to 200-fold (chromium in sample V-11). A number of positive results were above the sample detection limit but below the reporting limit, which corresponds to the lowest concentration calibration standard. These extrapolations are considered estimated and were flagged "J" by the laboratory.

OVERALL ASSESSMENT OF DATA

The overall quality of this data package was acceptable. No data were rejected. The results for ignitability were qualified as estimated because of inadequate sample preservation (cooling) during shipping and storage. All ignitability results were reported as not detected at 180 °F, but the possibility exists that some properly preserved samples would have somewhat lower flash points. All results may be used as qualified.

Please call me at (678) 775-3104 if you have any questions regarding this data validation report.

Sincerely,



Jessica Vickers
START III Quality Assurance Manager

Enclosures (3)

cc: Katrina Jones, EPA Project Officer
Darryl Walker, EPA Alternate Project Officer
Angel Reed, Tetra Tech START III Document Control Coordinator

ENCLOSURE 1

**FIXED LABORATORY ANALYTICAL RESULTS SHEETS WITH HAND-ENTERED DATA
VALIDATION QUALIFIERS FOR ANALYTICAL ENVIRONMENTAL SERVICES, INC.,
REPORT NO. 0811F46**

(Seventeen Pages)

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-001

Client Sample ID: V-01
Collection Date: 11/18/2008

Matrix: SOLID

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
MERCURY, TCLP								
Mercury	BRL	U	SW1311/7470A 0.000288	(SW7470) 0.00400	mg/L	107163	1	Analyst: MAW 12/1/2008 8:13:10 PM
ICP METALS, TCLP								
Arsenic	BRL	U	SW1311/6010B 0.0467	(SW3010A) 0.250	mg/L	107159	1	Analyst: DJ 12/1/2008 11:31:19 AM
Barium	0.425	J	0.00455	0.500	mg/L	107159	1	12/1/2008 11:31:19 AM
Cadmium	BRL	U	0.0175	0.0250	mg/L	107159	1	12/1/2008 11:31:19 AM
Chromium	52.0	J	0.00565	0.0500	mg/L	107159	1	12/1/2008 11:31:19 AM
Lead	25.2	J	0.0105	0.0500	mg/L	107159	1	12/1/2008 11:31:19 AM
Selenium	BRL	U	0.0357	0.100	mg/L	107159	1	12/1/2008 11:31:19 AM
Silver	BRL	U	0.00540	0.0250	mg/L	107159	1	12/1/2008 11:31:19 AM
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 1.00	(SW7.3.3.2) 1.00	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	(SW7.3.4.2) 100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
LABORATORY HYDROGEN ION (PH)								
pH	9.81		SW9045D 0.01	(SW9045D) 0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

Qaw
01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-002

Client Sample ID: V-03
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 17	17	mg/Kg	107056	5	Analyst: TAA 11/28/2008 9:26:35 PM
Barium	71		3.3	3.3	mg/Kg	107056	1	11/26/2008 9:41:19 PM
Cadmium	BRL	U	1.7	1.7	mg/Kg	107056	1	11/26/2008 9:41:19 PM
Chromium	1500		8.3	8.3	mg/Kg	107056	5	11/28/2008 9:26:35 PM
Lead	330		3.3	3.3	mg/Kg	107056	1	11/26/2008 9:41:19 PM
Selenium	3.6		3.3	3.3	mg/Kg	107056	1	11/26/2008 9:41:19 PM
Silver	BRL	U	1.7	1.7	mg/Kg	107056	1	11/26/2008 9:41:19 PM
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.0292	J	SW7471A 0.0100	0.100	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:31:23 PM
LABORATORY HYDROGEN ION (PH)								
pH	5.95		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-003

Client Sample ID: V-04
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 47	47	mg/Kg	107056	10	Analyst: TAA 11/28/2008 9:53:12 PM
Barium	BRL	↓	4.7	4.7	mg/Kg	107056	1	11/26/2008 10:12:31 P
Cadmium	BRL	↓	23	23	mg/Kg	107056	10	11/28/2008 9:53:12 PM
Chromium	4.3		2.3	2.3	mg/Kg	107056	1	11/26/2008 10:12:31 P
Lead	BRL	U	47	47	mg/Kg	107056	10	11/28/2008 9:53:12 PM
Selenium	5.2		4.7	4.7	mg/Kg	107056	1	11/26/2008 10:12:31 P
Silver	BRL	U	2.3	2.3	mg/Kg	107056	1	11/26/2008 10:12:31 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.971	0.971	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	401		SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00988	0.0988	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:35:46 PM
LABORATORY HYDROGEN ION (PH)								
pH	9.50		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.


Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-004

Client Sample ID: V-05
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 4.5	4.5	mg/Kg	107056	1	Analyst: TAA 11/26/2008 10:15:42 P
Barium	BRL	U	4.5	4.5	mg/Kg	107056	1	11/26/2008 10:15:42 P
Cadmium	2.9		2.3	2.3	mg/Kg	107056	1	11/26/2008 10:15:42 P
Chromium	10000		110	110	mg/Kg	107056	50	11/28/2008 10:01:22 P
Lead	100		4.5	4.5	mg/Kg	107056	1	11/26/2008 10:15:42 P
Selenium	BRL	U	4.5	4.5	mg/Kg	107056	1	11/26/2008 10:15:42 P
Silver	BRL	U	2.3	2.3	mg/Kg	107056	1	11/26/2008 10:15:42 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.971	0.971	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.0103	J	SW7471A 0.00990	0.0990	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:37:56 PM
LABORATORY HYDROGEN ION (PH)								
pH	0.77		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


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Qualifiers:

- * Value exceeds Maximum Contaminant Level
- > Greater than Result value
- E Estimated value above quantitation range
- J Estimated value detected below Reporting Limit
- Rpt Lim Reporting Limit

- < Less than Result value
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- S Spike Recovery outside limits due to matrix
- BRL Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-005

Client Sample ID: V-10
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	5.3		SW6010B 4.1	4.1	mg/Kg	107056	1	Analyst: TAA 11/28/2008 10:05:30 P
Barium	BRL	U	4.1	4.1	mg/Kg	107056	1	11/26/2008 10:19:52 P
Cadmium	BRL	U	2.1	2.1	mg/Kg	107056	1	11/26/2008 10:19:52 P
Chromium	3700		21	21	mg/Kg	107056	10	11/28/2008 10:09:38 P
Lead	BRL	U	4.1	4.1	mg/Kg	107056	1	11/26/2008 10:19:52 P
Selenium	BRL	U	4.1	4.1	mg/Kg	107056	1	11/26/2008 10:19:52 P
Silver	BRL	U	2.1	2.1	mg/Kg	107056	1	11/26/2008 10:19:52 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00992	0.00992	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:40:07 PM
LABORATORY HYDROGEN ION (PH)								
pH	3.10		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-006

Client Sample ID: V-11
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	130		SW6010B 4.5	4.5	mg/Kg	107056	1	Analyst: TAA 11/28/2008 10:12:49 P
Barium	90		4.5	4.5	mg/Kg	107056	1	11/26/2008 10:23:06 P
Cadmium	BRL	U	2.2	2.2	mg/Kg	107056	1	11/26/2008 10:23:06 P
Chromium	120000		450	450	mg/Kg	107056	200	12/1/2008 3:40:14 PM
Lead	11		4.5	4.5	mg/Kg	107056	1	11/26/2008 10:23:06 P
Selenium	BRL	U	4.5	4.5	mg/Kg	107056	1	11/26/2008 10:23:06 P
Silver	BRL	U	22	22	mg/Kg	107056	10	11/28/2008 10:16:58 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00996	0.00996	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:42:18 PM
LABORATORY HYDROGEN ION (PH)								
pH	1.05		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim	Reporting Limit		S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.


Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-007

Client Sample ID: V-12
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: TAA
Arsenic	BRL	U	39	39	mg/Kg	107056	10	11/28/2008 10:33:24 P
Barium	BRL	U	3.9	3.9	mg/Kg	107056	1	11/26/2008 10:27:15 P
Cadmium	BRL	U	19	19	mg/Kg	107056	10	11/28/2008 10:33:24 P
Chromium	28		19	19	mg/Kg	107056	10	11/28/2008 10:33:24 P
Lead	BRL	U	39	39	mg/Kg	107056	10	11/28/2008 10:33:24 P
Selenium	4.6		3.9	3.9	mg/Kg	107056	1	11/26/2008 10:27:15 P
Silver	BRL	U	1.9	1.9	mg/Kg	107056	1	11/26/2008 10:27:15 P
CYANIDE, REACTIVE			SW7.3.3.2	(SW7.3.3.2)				Analyst: CG
Cyanide, Reactive	BRL	U	0.990	0.990	mg/Kg	107210	1	12/1/2008 4:00:00 PM
SULFIDE, REACTIVE			SW7.3.4.2	(SW7.3.4.2)				Analyst: MAS
Sulfide, Reactive	BRL	U	100	100	mg/Kg	107197	1	12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE			SW7471A	(SW7471)				Analyst: MAW
Mercury	BRL	U	0.00977	0.0977	mg/Kg	107166	1	12/1/2008 4:44:29 PM
LABORATORY HYDROGEN ION (PH)			SW9045D	(SW9045D)				Analyst: CG
pH	5.83		0.01	0.01	pH Units	107211	1	11/24/2008 6:30:00 PM


01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-008

Client Sample ID: V-13
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 27	27	mg/Kg	107056	10	Analyst: TAA 11/28/2008 10:37:30 P
Barium	BRL	U	2.7	2.7	mg/Kg	107056	1	11/26/2008 10:31:26 P
Cadmium	BRL	U	1.3	1.3	mg/Kg	107056	1	11/26/2008 10:31:26 P
Chromium	1.4		1.3	1.3	mg/Kg	107056	1	11/26/2008 10:31:26 P
Lead	BRL	U	27	27	mg/Kg	107056	10	11/28/2008 10:37:30 P
Selenium	BRL	U	2.7	2.7	mg/Kg	107056	1	11/26/2008 10:31:26 P
Silver	BRL	U	1.3	1.3	mg/Kg	107056	1	11/26/2008 10:31:26 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00990	0.00990	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:46:44 PM
LABORATORY HYDROGEN ION (PH)								
pH	5.88		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

gaw
01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-009

Client Sample ID: V-14
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 76	76	mg/Kg	107056	20	Analyst: TAA 11/28/2008 10:41:35 P
Barium	BRL	U	3.8	3.8	mg/Kg	107056	1	11/26/2008 10:35:38 P
Cadmium	BRL	U	38	38	mg/Kg	107056	20	11/28/2008 10:41:35 P
Chromium	2.0		1.9	1.9	mg/Kg	107056	1	11/26/2008 10:35:38 P
Lead	BRL	U	76	76	mg/Kg	107056	20	11/28/2008 10:41:35 P
Selenium	4.7		3.8	3.8	mg/Kg	107056	1	11/26/2008 10:35:38 P
Silver	BRL	U	1.9	1.9	mg/Kg	107056	1	11/26/2008 10:35:38 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.990	0.990	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00990	0.00990	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:48:55 PM
LABORATORY HYDROGEN ION (PH)								
pH	5.68		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

gaw
01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-010

Client Sample ID: V-17
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 2.6	2.6	mg/Kg	107056	1	Analyst: TAA 11/26/2008 10:47:58 P
Barium	BRL	U	2.6	2.6	mg/Kg	107056	1	11/26/2008 10:47:58 P
Cadmium	BRL	U	1.3	1.3	mg/Kg	107056	1	11/26/2008 10:47:58 P
Chromium	75		13	13	mg/Kg	107056	10	12/2/2008 4:58:51 PM
Lead	2.9		2.6	2.6	mg/Kg	107056	1	11/26/2008 10:47:58 P
Selenium	BRL	U	2.6	2.6	mg/Kg	107056	1	11/26/2008 10:47:58 P
Silver	BRL	U	1.3	1.3	mg/Kg	107056	1	11/26/2008 10:47:58 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.990	0.990	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00998	0.0998	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:55:35 PM
LABORATORY HYDROGEN ION (PH)								
pH	1.17		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-011

Client Sample ID: V-18
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.1	3.1	mg/Kg	107056	1	Analyst: TAA 11/26/2008 10:52:06 P
Barium	BRL	↓	3.1	3.1	mg/Kg	107056	1	11/26/2008 10:52:06 P
Cadmium	BRL	↓	1.5	1.5	mg/Kg	107056	1	11/26/2008 10:52:06 P
Chromium	2.6		1.5	1.5	mg/Kg	107056	1	11/26/2008 10:52:06 P
Lead	BRL	U	3.1	3.1	mg/Kg	107056	1	11/26/2008 10:52:06 P
Selenium	BRL	↓	3.1	3.1	mg/Kg	107056	1	11/26/2008 10:52:06 P
Silver	BRL	↓	1.5	1.5	mg/Kg	107056	1	11/26/2008 10:52:06 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.990	0.990	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00986	0.00986	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:57:46 PM
LABORATORY HYDROGEN ION (PH)								
pH	10.4		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

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01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-012

Client Sample ID: V-19
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.3	3.3	mg/Kg	107056	1	Analyst: TAA 11/26/2008 10:56:13 P
Barium	BRL	U	3.3	3.3	mg/Kg	107056	1	11/26/2008 10:56:13 P
Cadmium	BRL	U	1.6	1.6	mg/Kg	107056	1	11/26/2008 10:56:13 P
Chromium	BRL	U	1.6	1.6	mg/Kg	107056	1	11/26/2008 10:56:13 P
Lead	BRL	U	3.3	3.3	mg/Kg	107056	1	11/26/2008 10:56:13 P
Selenium	BRL	U	3.3	3.3	mg/Kg	107056	1	11/26/2008 10:56:13 P
Silver	BRL	U	1.6	1.6	mg/Kg	107056	1	11/26/2008 10:56:13 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.980	0.980	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.0477	J	SW7471A 0.0100	0.100	mg/Kg	107166	1	Analyst: MAW 12/1/2008 4:59:57 PM
LABORATORY HYDROGEN ION (PH)								
pH	10.2		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

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01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.


Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-013

Client Sample ID: V-20
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.4	3.4	mg/Kg	107056	1	Analyst: TAA 11/26/2008 11:00:20 P
Barium	BRL		3.4	3.4	mg/Kg	107056	1	11/26/2008 11:00:20 P
Cadmium	BRL		1.7	1.7	mg/Kg	107056	1	11/26/2008 11:00:20 P
Chromium	BRL		1.7	1.7	mg/Kg	107056	1	11/26/2008 11:00:20 P
Lead	BRL		3.4	3.4	mg/Kg	107056	1	11/26/2008 11:00:20 P
Selenium	BRL		3.4	3.4	mg/Kg	107056	1	11/26/2008 11:00:20 P
Silver	BRL		1.7	1.7	mg/Kg	107056	1	11/26/2008 11:00:20 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.962	0.962	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	5.41		SW7471A 0.0996	0.996	mg/Kg	107166	10	Analyst: MAW 12/1/2008 6:55:08 PM
LABORATORY HYDROGEN ION (PH)								
pH	6.75		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-014

Client Sample ID: V-21
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 5.8	5.8	mg/Kg	107056	2	Analyst: TAA 11/28/2008 10:45:44 P
Barium	BRL		2.9	2.9	mg/Kg	107056	1	11/26/2008 11:04:28 P
Cadmium	BRL		1.5	1.5	mg/Kg	107056	1	11/26/2008 11:04:28 P
Chromium	BRL		1.5	1.5	mg/Kg	107056	1	11/26/2008 11:04:28 P
Lead	BRL		2.9	2.9	mg/Kg	107056	1	11/26/2008 11:04:28 P
Selenium	BRL		2.9	2.9	mg/Kg	107056	1	11/26/2008 11:04:28 P
Silver	BRL		1.5	1.5	mg/Kg	107056	1	11/26/2008 11:04:28 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.971	0.971	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	BRL	U	SW7471A 0.00986	0.00986	mg/Kg	107166	1	Analyst: MAW 12/1/2008 5:04:18 PM
LABORATORY HYDROGEN ION (PH)								
pH	4.03		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-015

Client Sample ID: V-22
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.0	3.0	mg/Kg	107056	1	Analyst: TAA 11/26/2008 11:08:36 P
Barium	BRL	U	3.0	3.0	mg/Kg	107056	1	11/26/2008 11:08:36 P
Cadmium	BRL	U	1.5	1.5	mg/Kg	107056	1	11/26/2008 11:08:36 P
Chromium	320		15	15	mg/Kg	107056	10	12/2/2008 5:02:57 PM
Lead	BRL	U	3.0	3.0	mg/Kg	107056	1	11/26/2008 11:08:36 P
Selenium	BRL	U	3.0	3.0	mg/Kg	107056	1	11/26/2008 11:08:36 P
Silver	BRL	U	1.5	1.5	mg/Kg	107056	1	11/26/2008 11:08:36 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.980	0.980	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.0138	U	SW7471A 0.00973	0.0973	mg/Kg	107166	1	Analyst: MAW 12/1/2008 5:06:29 PM
LABORATORY HYDROGEN ION (PH)								
pH	3.81		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

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01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-016

Client Sample ID: V-23
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.5	3.5	mg/Kg	107056	1	Analyst: TAA 11/26/2008 11:12:43 P
Barium	BRL	U	3.5	3.5	mg/Kg	107056	1	11/26/2008 11:12:43 P
Cadmium	BRL	U	1.7	1.7	mg/Kg	107056	1	11/26/2008 11:12:43 P
Chromium	BRL	U	1.7	1.7	mg/Kg	107056	1	11/26/2008 11:12:43 P
Lead	BRL	U	3.5	3.5	mg/Kg	107056	1	11/26/2008 11:12:43 P
Selenium	BRL	U	3.5	3.5	mg/Kg	107056	1	11/26/2008 11:12:43 P
Silver	BRL	U	1.7	1.7	mg/Kg	107056	1	11/26/2008 11:12:43 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.0294	J	SW7471A 0.00978	0.0978	mg/Kg	107166	1	Analyst: MAW 12/1/2008 5:08:43 PM
LABORATORY HYDROGEN ION (PH)								
pH	6.21		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM


01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 11-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0811F46
Project: Richard Plating
Lab ID: 0811F46-017

Client Sample ID: V-24
Collection Date: 11/18/2008

Matrix: WASTE

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
IGNITABILITY								
Ignitability	180	> J	SW1010 0	0	°F			Analyst: MAS 1 12/2/2008 8:30:00 AM
METALS, TOTAL								
Arsenic	BRL	U	SW6010B 3.5	3.5	mg/Kg	107056	1	Analyst: TAA 11/26/2008 11:16:48 P
Barium	BRL		3.5	3.5	mg/Kg	107056	1	11/26/2008 11:16:48 P
Cadmium	BRL		1.8	1.8	mg/Kg	107056	1	11/26/2008 11:16:48 P
Chromium	BRL		1.8	1.8	mg/Kg	107056	1	11/26/2008 11:16:48 P
Lead	BRL		3.5	3.5	mg/Kg	107056	1	11/26/2008 11:16:48 P
Selenium	BRL		3.5	3.5	mg/Kg	107056	1	11/26/2008 11:16:48 P
Silver	BRL		1.8	1.8	mg/Kg	107056	1	11/26/2008 11:16:48 P
CYANIDE, REACTIVE								
Cyanide, Reactive	BRL	U	SW7.3.3.2 0.952	0.952	mg/Kg	107210	1	Analyst: CG 12/1/2008 4:00:00 PM
SULFIDE, REACTIVE								
Sulfide, Reactive	BRL	U	SW7.3.4.2 100	100	mg/Kg	107197	1	Analyst: MAS 12/1/2008 8:40:00 AM
TOTAL MERCURY - WASTE								
Mercury	0.143		SW7471A 0.00992	0.00992	mg/Kg	107166	1	Analyst: MAW 12/1/2008 5:15:23 PM
LABORATORY HYDROGEN ION (PH)								
pH	6.26		SW9045D 0.01	0.01	pH Units	107211	1	Analyst: CG 11/24/2008 6:30:00 PM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

ENCLOSURE 2

**DATA VALIDATION-QUALIFIED FIXED LABORATORY ANALYTICAL RESULTS FOR
ANALYTICAL ENVIRONMENTAL SERVICES, INC., REPORT NO. 0811F46**

(One Page)

**ANALYTICAL RESULTS FOR WASTE SAMPLES IN REPORT NO. 0811F46
RICHARDS METAL PLATING RESPONSE**

Sample Designation:	V-01	V-03	V-04	V-05	V-10
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/L	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	0.25 U	16.7 U	46.5 U	4.5 U	5.32
Barium	0.42 J	70.9	4.65 U	4.5 U	4.1 U
Cadmium	0.02 U	1.67 U	23.3 U	2.92	2.05 U
Chromium	52.0	1550	4.31	10300	3720
Lead	25.2	334	46.5 U	103	4.1 U
Mercury	0.0040 U	0.03 J	0.10 U	0.010 J	0.10 U
Selenium	0.10 U	3.62	5.19	4.5 U	4.1 U
Characteristic Parameters					
Corrosivity (pH Units)	9.81	5.95	9.50	0.77	3.10
Reactive Sulfide (mg/kg)	100 U	100 U	401	100 U	100 U

Sample Designation:	V-11	V-12	V-13	V-14	V-17
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	134	38.8 U	26.6 U	75.8 U	2.59 U
Barium	89.9	3.88 U	2.66 U	3.79 U	2.59 U
Chromium	120000	28.5	1.44	2.04	75.2
Lead	11.4	38.8 U	26.6 U	75.8 U	2.85
Selenium	4.47 U	4.56	2.66 U	4.68	2.59 U
Characteristic Parameters					
Corrosivity (pH Units)	1.05	5.83	5.88	5.68	1.17

Sample Designation:	V-18	V-19	V-20	V-21	V-22
Sample Collection Date:	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08	18-Nov-08
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Chromium	2.61	1.63 U	1.69 U	1.45 U	317
Mercury	0.10 U	0.05 J	5.41	0.10 U	0.010 J
Characteristic Parameters					
Corrosivity (pH Units)	10.4	10.2	6.75	4.03	3.81

Sample Designation:	V-23	V-24
Sample Collection Date:	18-Nov-08	18-Nov-08
Hexavalent Chromium		
Hexavalent Chromium	NA	NA
Metals	mg/kg	mg/kg
Chromium	1.75 U	1.75 U
Mercury	0.030 J	0.14
Characteristic Parameters		
Corrosivity (pH Units)	6.21	6.26

Notes:

Indicate potential hazardous waste if the sample is less than 0.5% filterable solids, by weight.

Indicates the returned value is greater than 20 times the regulatory disposal limit for hazardous waste.

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria.

NA = Not analyzed



February 9, 2009

Mr. Jordan Garrard
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, GA 30303

Subject: Richards Metal Plating Response Site
Technical Direction Document Number TTEMI-05-001-0082
Contract No. EP-W-05-054 (START III Region 4)
Cursory Data Validation Report
Analytical Environmental Services, Inc., Reports Nos. 0812E02 and 0812E77
Analytical Parameters: Total Resource Conservation and Recovery Act (RCRA)
Metals and Hexavalent Chromium

Laboratory Report No.	Samples	Field Duplicate Pairs	Field Blank Samples
0812E02	RP-CORE-4A, RP-CORE-4B, RP-CORE-5A, RP-CORE-6A, RP-CORE-6B, RP-SD-01, RP-SD-02, RP-SD-03, RP-SS-01, RP-SS-02, RP-SS-03, RP-SS-04, RP-SS-05, RP-SS-06, and RP-SS-07	None	None
0812E77	RP-COUNT	None	None

Dear Mr. Garrard:

The Tetra Tech Superfund Technical Assessment and Response Team (START) conducted data validation on the analytical results for fifteen soil and sediment samples and one liquid waste sample that were collected at the Richards Metal Plating Response Site in Florence, Alabama, on December 16 and 17, 2008. The samples were analyzed under laboratory reports numbers 0812E02 and 0812E77 by Analytical Environmental Services, Inc. (AES), of Atlanta, Georgia. The samples were analyzed for total RCRA metals by SW-846 Methods 6010B, 7470A, and 7471A and for hexavalent chromium by SW-846 Method 7196 and Standard Method (SM) 3500-Cr D.

Analytical data were evaluated in general accordance with applicable data validation guidance documents, including the following: the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines (NFG) for Inorganic Data Review (EPA October 2004). The analytical methods used by AES during this project provide guidance on procedures and method acceptance criteria that, in some areas, differ from the NFGs. Where the methods and the NFGs differ, the data validators followed the acceptance criteria in the methods. In addition, if laboratory-derived acceptance criteria were presented in the AES data packages, then these criteria were used to evaluate the data, unless the criteria were considered inadequate.

Data were evaluated based on the following criteria:

- Data Completeness *
- Sample Preservation, Sample Receipt, and Holding Times
- Laboratory Blanks

- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Laboratory Control Samples (LCS) and Laboratory Control Sample Duplicates (LCSD) *
- Dilution and Reported Detection Limits
- Analyte Quantitation *

* All QC criteria were met for this evaluated parameter. Those criteria without an asterisk (*) displayed a deficiency that is described later in this report.

The following efficient and effective data validation approach was used for providing an abbreviated assessment of the quality of the set of data. Data evaluation consisted of a review of the data with a focus on the available review parameters present in the summary data package (which typically does not include the raw data). This review was not a complete assessment of all possible quality control parameters or even of each quality control parameter that was reviewed. The review, rather, was intended to efficiently identify and focus on those problems and quality control deficiencies that could be readily identified from the summary data package. Because of the nature of this approach, some problems and deficiencies may not have been identified; as such, this approach may not support some critical uses and required limits on decision-making uncertainty for the data.

Enclosure 1 presents copies of the sample results sheets from the laboratory data package, with hand-entered qualifications from the data validation effort. Enclosure 2 presents the same data validation-qualified analytical results in table format.

SAMPLE PRESERVATION, SAMPLE RECEIPT, AND HOLDING TIMES

The sample preservation requirement for hexavalent chromium is refrigeration (4 °C) and the holding times are 24 hours from collection to extraction and 24 hours from extraction to analysis. All samples were received at the laboratory more than 24 hours after collection and the soil samples were received at ambient temperature. The samples were then analyzed a week or more after collection. Due to the holding time and preservation irregularities, all hexavalent chromium results were considered estimated, possibly biased low, and were flagged “J” or “UJ”, as appropriate.

LABORATORY BLANKS

The laboratory blanks for the soil and sediment samples contained concentrations of chromium and mercury below the reporting limit. The mercury results for samples RP-SS-02, RP-SS-03, RP-SS-04, RP-SS-05, RP-SS-06, RP-SS-07, RP-SD-01, and RP-SD-02 were raised to their respective reporting limits and qualified as non-detect (flagged “U”). The remaining associated samples contained concentrations of chromium and mercury above the reporting limit; therefore, no qualifications were applied.

MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD)

The soil metals MS/MSD analyses were performed on sample RP-SS-07. Recoveries of chromium and lead could not be determined because the unspiked sample contained concentrations of those metals greater than four times the spiked amount. No qualifications are warranted for this data gap. The selenium recoveries were 78 and 74 percent, versus QC limits of 75 to 125 percent. Because one recovery and the average recovery were within QC limits, no qualifications were applied. All other MS/MSD results were within the specified control limits; therefore, no qualifications are warranted.

Mr. J. Garrard
February 9, 2009

DILUTION AND REPORTED DETECTION LIMITS

Barium, lead, and sometimes chromium in the soil samples were re-analyzed at dilutions of two-fold to ten-fold to bring the results within the linear range of the analytical instrument. A number of positive results were above the sample detection limit but below the reporting limit, which corresponds to the lowest concentration calibration standard. These extrapolations are considered estimated and were flagged "J" by the laboratory.

OVERALL ASSESSMENT OF DATA

The overall quality of this data package was acceptable. No data were rejected. The results for hexavalent chromium were qualified as estimated because of inadequate sample preservation during collection and shipping and delay in analysis. All results may be used as qualified.

Please call me at (678) 775-3104 if you have any questions regarding this data validation report.

Sincerely,



Jessica Vickers
START III Quality Assurance Manager

Enclosures (3)

cc: Katrina Jones, EPA Project Officer
Darryl Walker, EPA Alternate Project Officer
Angel Reed, Tetra Tech START III Document Control Coordinator

ENCLOSURE 1

**FIXED LABORATORY ANALYTICAL RESULTS SHEETS WITH HAND-ENTERED DATA
VALIDATION QUALIFIERS FOR ANALYTICAL ENVIRONMENTAL SERVICES, INC.,
REPORT NOS. 0812E02 AND 0812E77**

(Sixteen Pages)

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
 Lab Order: 0812E02
 Project: Richard Metal Plating Response
 Lab ID: 0812E02-011

Client Sample ID: RP-CORE-4 A
 Collection Date: 12/17/2008 12:20:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	7.40		0.180	6.00 mg/Kg-dry	108096	1	12/24/2008 7:00:56 PM	
Barium	49.4		0.901	30.0 mg/Kg-dry	108096	5	12/24/2008 8:41:53 PM	
Cadmium	BRL	U	0.0396	3.00 mg/Kg-dry	108096	1	12/24/2008 7:00:56 PM	
Chromium	1310		0.0793	3.00 mg/Kg-dry	108096	1	12/24/2008 7:00:56 PM	
Lead	14.1		0.240	12.0 mg/Kg-dry	108096	2	12/26/2008 7:09:09 PM	
Selenium	BRL	U	0.480	6.00 mg/Kg-dry	108096	1	12/24/2008 7:00:56 PM	
Silver	0.150	J	0.0168	3.00 mg/Kg-dry	108096	1	12/24/2008 7:00:56 PM	
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	25.7	J	0.0807	1.20 mg/Kg-dry	108222	1	12/26/2008 12:00:00 P	
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.0710	J	0.00440	0.126 mg/Kg-dry	108062	1	12/23/2008 8:09:10 PM	
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	22.8		0	0 wt%		1	12/26/2008 8:00:00 AM	

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 01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-012

Client Sample ID: RP-CORE-4 B
Collection Date: 12/17/2008 12:30:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	7.79		0.170	5.68 mg/Kg-dry	108096	1	12/24/2008 7:05:08 PM	
Barium	64.4		0.852	28.4 mg/Kg-dry	108096	5	12/24/2008 8:45:39 PM	
Cadmium	BRL	U	0.0375	2.84 mg/Kg-dry	108096	1	12/24/2008 7:05:08 PM	
Chromium	4230		0.375	14.2 mg/Kg-dry	108096	5	12/24/2008 8:45:39 PM	
Lead	28.4		0.568	28.4 mg/Kg-dry	108096	5	12/24/2008 8:45:39 PM	
Selenium	BRL	U	0.454	5.68 mg/Kg-dry	108096	1	12/24/2008 7:05:08 PM	
Silver	0.193	J	0.0159	2.84 mg/Kg-dry	108096	1	12/24/2008 7:05:08 PM	
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	34.9	J	0.0921	1.37 mg/Kg-dry	108222	1	12/26/2008 12:00:00 P	
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.0734	J	0.00480	0.137 mg/Kg-dry	108062	1	12/23/2008 8:11:21 PM	
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	28.4		0	0 wt%		1	12/26/2008 8:00:00 AM	

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-013

Client Sample ID: RP-CORE-5 A
Collection Date: 12/17/2008 1:20:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	11.5		0.169	5.62 mg/Kg-dry	108096	1	12/24/2008 7:15:48 PM	
Barium	47.3		0.843	28.1 mg/Kg-dry	108096	5	12/24/2008 8:49:27 PM	
Cadmium	BRL	U	0.0371	2.81 mg/Kg-dry	108096	1	12/24/2008 7:15:48 PM	
Chromium	1780		0.0741	2.81 mg/Kg-dry	108096	1	12/24/2008 7:15:48 PM	
Lead	14.2		0.225	11.2 mg/Kg-dry	108096	2	12/26/2008 7:12:55 PM	
Selenium	BRL	U	0.449	5.62 mg/Kg-dry	108096	1	12/24/2008 7:15:48 PM	
Silver	1.11	J	0.0157	2.81 mg/Kg-dry	108096	1	12/24/2008 7:15:48 PM	
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	276	J	0.0939	1.40 mg/Kg-dry	108222	1	12/26/2008 12:00:00 P	
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.0686	J	0.00487	0.139 mg/Kg-dry	108062	1	12/23/2008 8:13:32 PM	
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	28.4		0	0 wt%		1	12/26/2008 8:00:00 AM	

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-014

Client Sample ID: RP-CORE-6 A
Collection Date: 12/17/2008 3:15:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	4.96		0.131	4.36	mg/Kg-dry	108096	1	12/24/2008 7:19:35 PM
Barium	158		0.654	21.8	mg/Kg-dry	108096	5	12/24/2008 8:53:16 PM
Cadmium	82.9		0.0288	2.18	mg/Kg-dry	108096	1	12/24/2008 7:19:35 PM
Chromium	81.3		0.0575	2.18	mg/Kg-dry	108096	1	12/24/2008 7:19:35 PM
Lead	127		0.436	21.8	mg/Kg-dry	108096	5	12/24/2008 8:53:16 PM
Selenium	BRL	U	0.349	4.36	mg/Kg-dry	108096	1	12/24/2008 7:19:35 PM
Silver	1.89	J	0.0122	2.18	mg/Kg-dry	108096	1	12/24/2008 7:19:35 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	0.766	J	0.0831	1.24	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.0849	J	0.00424	0.121	mg/Kg-dry	108062	1	12/23/2008 8:15:43 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	19.1		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-015

Client Sample ID: RP-CORE-6 B
Collection Date: 12/17/2008 3:20:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	9.73		0.171	5.70	mg/Kg-dry	108096	1	12/24/2008 7:23:32 PM
Barium	91.5		0.855	28.5	mg/Kg-dry	108096	5	12/24/2008 8:57:02 PM
Cadmium	1.18	J	0.0376	2.85	mg/Kg-dry	108096	1	12/24/2008 7:23:32 PM
Chromium	49.3		0.0752	2.85	mg/Kg-dry	108096	1	12/24/2008 7:23:32 PM
Lead	273		0.570	28.5	mg/Kg-dry	108096	5	12/24/2008 8:57:02 PM
Selenium	BRL	U	0.456	5.70	mg/Kg-dry	108096	1	12/24/2008 7:23:32 PM
Silver	0.0700	J	0.0160	2.85	mg/Kg-dry	108096	1	12/24/2008 7:23:32 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	BRL	UJ	0.0972	1.45	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.165		0.00504	0.144	mg/Kg-dry	108062	1	12/23/2008 8:17:54 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	30.8		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
 Lab Order: 0812E02
 Project: Richard Metal Plating Response
 Lab ID: 0812E02-008

Client Sample ID: RP-SD-01
 Collection Date: 12/16/2008 11:15:00 AM

Matrix: SEDIMENT

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	7.36		0.134	4.46	mg/Kg-dry	108096	1	12/24/2008 6:49:27 PM
Barium	30.3		0.669	22.3	mg/Kg-dry	108096	5	12/24/2008 8:30:51 PM
Cadmium	0.160	J	0.0295	2.23	mg/Kg-dry	108096	1	12/24/2008 6:49:27 PM
Chromium	2840		0.295	11.2	mg/Kg-dry	108096	5	12/24/2008 8:30:51 PM
Lead	27.2		0.446	22.3	mg/Kg-dry	108096	5	12/24/2008 8:30:51 PM
Selenium	BRL	U	0.357	4.46	mg/Kg-dry	108096	1	12/24/2008 6:49:27 PM
Silver	0.0335	J	0.0125	2.23	mg/Kg-dry	108096	1	12/24/2008 6:49:27 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	54.3	J	0.0728	1.08	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.112	0:0480 → U	0.00392	0.112	mg/Kg-dry	108061	1	12/23/2008 7:12:06 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	11.1		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-009

Client Sample ID: RP-SD-02
Collection Date: 12/16/2008 12:55:00 PM

Matrix: SEDIMENT

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	3.27	J	0.166	5.55	mg/Kg-dry	108096	1	12/24/2008 6:53:20 PM
Barium	65.0		0.832	27.7	mg/Kg-dry	108096	5	12/24/2008 8:34:34 PM
Cadmium	0.0994	J	0.0366	2.77	mg/Kg-dry	108096	1	12/24/2008 6:53:20 PM
Chromium	806		0.0732	2.77	mg/Kg-dry	108096	1	12/24/2008 6:53:20 PM
Lead	215		0.555	27.7	mg/Kg-dry	108096	5	12/24/2008 8:34:34 PM
Selenium	BRL	U	0.444	5.55	mg/Kg-dry	108096	1	12/24/2008 6:53:20 PM
Silver	BRL	U	0.0155	2.77	mg/Kg-dry	108096	1	12/24/2008 6:53:20 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	0.0950	J	0.0799	1.19	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.116	J	0.00408	0.116	mg/Kg-dry	108061	1	12/23/2008 7:14:17 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	15.8		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-010

Client Sample ID: RP-SD-03
Collection Date: 12/16/2008 1:05:00 PM

Matrix: SEDIMENT

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	3.16	J	0.158	5.26	mg/Kg-dry	108096	1	12/24/2008 6:57:05 PM
Barium	32.3		0.789	26.3	mg/Kg-dry	108096	5	12/24/2008 8:38:21 PM
Cadmium	0.156	J	0.0347	2.63	mg/Kg-dry	108096	1	12/24/2008 6:57:05 PM
Chromium	44.2		0.0695	2.63	mg/Kg-dry	108096	1	12/24/2008 6:57:05 PM
Lead	442		0.526	26.3	mg/Kg-dry	108096	5	12/24/2008 8:38:21 PM
Selenium	BRL	U	0.421	5.26	mg/Kg-dry	108096	1	12/24/2008 6:57:05 PM
Silver	BRL	U	0.0147	2.63	mg/Kg-dry	108096	1	12/24/2008 6:57:05 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	BRL	UJ	0.0812	1.21	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.209		0.00417	0.119	mg/Kg-dry	108061	1	12/23/2008 7:16:28 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	18.8		0	0	wt%		1	12/26/2008 8:00:00 AM

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01/27/09

Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-001

Client Sample ID: RP-SS-01
Collection Date: 12/16/2008 8:50:00 AM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	8.33		0.191	6.36 mg/Kg-dry	108096	1	12/23/2008 7:35:35 PM	
Barium	108		0.954	31.8 mg/Kg-dry	108096	5	12/24/2008 8:02:11 PM	
Cadmium	0.274	J	0.0420	3.18 mg/Kg-dry	108096	1	12/23/2008 7:35:35 PM	
Chromium	20.7		0.0840	3.18 mg/Kg-dry	108096	1	12/23/2008 7:35:35 PM	
Lead	145		0.636	31.8 mg/Kg-dry	108096	5	12/24/2008 8:02:11 PM	
Selenium	0.781	J	0.509	6.36 mg/Kg-dry	108096	1	12/23/2008 7:35:35 PM	
Silver	BRL	U	0.0178	3.18 mg/Kg-dry	108096	1	12/23/2008 7:35:35 PM	
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	BRL	US	0.0922	1.37 mg/Kg-dry	108222	1	12/26/2008 12:00:00 P	
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.238		0.00497	0.142 mg/Kg-dry	108061	1	12/23/2008 6:52:17 PM	
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	29.9		0	0 wt%		1	12/26/2008 8:00:00 AM	

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim	Reporting Limit		S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
 Lab Order: 0812E02
 Project: Richard Metal Plating Response
 Lab ID: 0812E02-002

Client Sample ID: RP-SS-02
 Collection Date: 12/16/2008 9:00:00 AM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	6.77		0.132	4.41 mg/Kg-dry	108096	1	12/24/2008 7:54:46 PM	
Barium	44.6		0.662	22.1 mg/Kg-dry	108096	5	12/24/2008 8:05:49 PM	
Cadmium	0.164	①	0.0291	2.21 mg/Kg-dry	108096	1	12/24/2008 7:54:46 PM	
Chromium	40.2		0.0583	2.21 mg/Kg-dry	108096	1	12/24/2008 7:54:46 PM	
Lead	44.9		0.441	22.1 mg/Kg-dry	108096	5	12/24/2008 8:05:49 PM	
Selenium	BRL	U	0.353	4.41 mg/Kg-dry	108096	1	12/24/2008 7:54:46 PM	
Silver	BRL	U	0.0124	2.21 mg/Kg-dry	108096	1	12/24/2008 7:54:46 PM	
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	BRL	UJ	0.0916	1.36 mg/Kg-dry	108222	1	12/26/2008 12:00:00 P	
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.044	0.0924 → J U	0.00505	0.144 mg/Kg-dry	108061	1	12/23/2008 6:54:29 PM	
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	32.0		0	0 wt%		1	12/26/2008 8:00:00 AM	

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-003

Client Sample ID: RP-SS-03
Collection Date: 12/16/2008 9:15:00 AM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	5.42		0.151	5.02	mg/Kg-dry	108096	1	12/24/2008 7:58:27 PM
Barium	49.5		0.753	25.1	mg/Kg-dry	108096	5	12/24/2008 8:09:26 PM
Cadmium	0.264	J	0.0331	2.51	mg/Kg-dry	108096	1	12/24/2008 7:58:27 PM
Chromium	308		0.0663	2.51	mg/Kg-dry	108096	1	12/24/2008 7:58:27 PM
Lead	158		0.502	25.1	mg/Kg-dry	108096	5	12/24/2008 8:09:26 PM
Selenium	BRL	U	0.402	5.02	mg/Kg-dry	108096	1	12/24/2008 7:58:27 PM
Silver	0.0266	J	0.0141	2.51	mg/Kg-dry	108096	1	12/24/2008 7:58:27 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	1.30	J	0.104	1.55	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.151	0.0783 → U	0.00529	0.151	mg/Kg-dry	108061	1	12/23/2008 6:56:40 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	35.6		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-004

Client Sample ID: RP-SS-04
Collection Date: 12/16/2008 11:00:00 AM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	4.40	Ⓟ	0.140	4.67	mg/Kg-dry	108096	1	12/24/2008 6:38:15 PM
Barium	67.1		0.700	23.3	mg/Kg-dry	108096	5	12/24/2008 8:13:01 PM
Cadmium	0.896	Ⓟ	0.0308	2.33	mg/Kg-dry	108096	1	12/24/2008 6:38:15 PM
Chromium	525		0.0616	2.33	mg/Kg-dry	108096	1	12/24/2008 6:38:15 PM
Lead	35.6		0.467	23.3	mg/Kg-dry	108096	5	12/24/2008 8:13:01 PM
Selenium	BRL	U	0.373	4.67	mg/Kg-dry	108096	1	12/24/2008 6:38:15 PM
Silver	0.239	Ⓟ	0.0131	2.33	mg/Kg-dry	108096	1	12/24/2008 6:38:15 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	42.6	J	0.0835	1.24	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.123	0.0459 → J U	0.00429	0.123	mg/Kg-dry	108061	1	12/23/2008 6:58:51 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	19.5		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-005

Client Sample ID: RP-SS-05
Collection Date: 12/16/2008 11:05:00 AM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	3.97	J	0.148	4.95	mg/Kg-dry	108096	1	12/24/2008 6:42:00 PM
Barium	49.3		0.742	24.7	mg/Kg-dry	108096	5	12/24/2008 8:16:39 PM
Cadmium	0.163	J	0.0327	2.47	mg/Kg-dry	108096	1	12/24/2008 6:42:00 PM
Chromium	137		0.0653	2.47	mg/Kg-dry	108096	1	12/24/2008 6:42:00 PM
Lead	89.8		0.495	24.7	mg/Kg-dry	108096	5	12/24/2008 8:16:39 PM
Selenium	BRL	U	0.396	4.95	mg/Kg-dry	108096	1	12/24/2008 6:42:00 PM
Silver	BRL	U	0.0139	2.47	mg/Kg-dry	108096	1	12/24/2008 6:42:00 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	2.12	J	0.0828	1.23	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.125	0.0322 → J	0.00439	0.125	mg/Kg-dry	108061	1	12/23/2008 7:05:29 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	20.4		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim	Reporting Limit		S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-006

Client Sample ID: RP-SS-06
Collection Date: 12/16/2008 1:40:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	4.96	①	0.179	5.97	mg/Kg-dry	108096	1	12/24/2008 6:45:43 PM
Barium	59.2		0.896	29.9	mg/Kg-dry	108096	5	12/24/2008 8:27:09 PM
Cadmium	0.554	①	0.0394	2.99	mg/Kg-dry	108096	1	12/24/2008 6:45:43 PM
Chromium	168		0.0788	2.99	mg/Kg-dry	108096	1	12/24/2008 6:45:43 PM
Lead	107		0.597	29.9	mg/Kg-dry	108096	5	12/24/2008 8:27:09 PM
Selenium	BRL	U	0.478	5.97	mg/Kg-dry	108096	1	12/24/2008 6:45:43 PM
Silver	BRL	U	0.0167	2.99	mg/Kg-dry	108096	1	12/24/2008 6:45:43 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	BRL	UJ	0.0892	1.33	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.131	0.0858 → J U	0.00458	0.131	mg/Kg-dry	108061	1	12/23/2008 7:07:40 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	24.6		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E02
Project: Richard Metal Plating Response
Lab ID: 0812E02-007

Client Sample ID: RP-SS-07
Collection Date: 12/16/2008 1:55:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	7.21		0.159	5.30	mg/Kg-dry	108096	1	12/23/2008 7:13:47 PM
Barium	98.0		0.318	10.6	mg/Kg-dry	108096	2	12/26/2008 7:01:22 PM
Cadmium	0.100	J	0.0350	2.65	mg/Kg-dry	108096	1	12/23/2008 7:13:47 PM
Chromium	6390		0.699	26.5	mg/Kg-dry	108096	10	12/24/2008 4:55:21 PM
Lead	361		0.530	26.5	mg/Kg-dry	108096	5	12/24/2008 6:00:32 PM
Selenium	BRL	U	0.424	5.30	mg/Kg-dry	108096	1	12/23/2008 7:13:47 PM
Silver	0.361	J	0.0148	2.65	mg/Kg-dry	108096	1	12/23/2008 7:13:47 PM
HEXAVALENT CHROMIUM			SW7196	(SW3060A)				Analyst: CG
Chromium, Hexavalent	7.33	J	0.0673	1.00	mg/Kg-dry	108222	1	12/26/2008 12:00:00 P
TOTAL MERCURY			SW7471A	(SW7471)				Analyst: MAW
Mercury	0.110	0.0922 J U	0.00385	0.110	mg/Kg-dry	108061	1	12/23/2008 7:09:51 PM
PERCENT MOISTURE			D2216					Analyst: MAS
Percent Moisture	9.16		0	0	wt%		1	12/26/2008 8:00:00 AM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

Analytical Environmental Services, Inc.

Date: 29-Dec-08

CLIENT: Tetra Tech EM Inc.
Lab Order: 0812E77
Project: Richards Plating
Lab ID: 0812E77-001

Client Sample ID: RP-COUNT
Collection Date: 12/16/2008 2:30:00 PM
Matrix: AQUEOUS

Analyses	Result	Qual	MDL	Rpt. Limit	Units	BatchID	DF	Date Analyzed
METALS, TOTAL			SW6010B	(SW3050B)				Analyst: DJ
Arsenic	BRL	U	3.0	3.0	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Barium	BRL	↓	3.0	3.0	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Cadmium	BRL	↓	1.5	1.5	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Chromium	3.4		1.5	1.5	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Lead	BRL	U	3.0	3.0	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Selenium	BRL	↓	3.0	3.0	mg/Kg	108211	1	12/26/2008 7:37:11 PM
Silver	BRL	↓	1.5	1.5	mg/Kg	108211	1	12/26/2008 7:37:11 PM
TOTAL MERCURY - WASTE			SW7471A	(SW7471)				Analyst: MAW
Mercury	BRL	U	0.00990	0.0990	mg/Kg	108066	1	12/23/2008 6:06:52 PM
HEXAVALENT CHROMIUM			M3500-CR D					Analyst: CG
Chromium, Hexavalent	BRL	HVS	0.002	0.010	mg/L		1	12/22/2008 6:00:00 PM

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Qualifiers:	*	Value exceeds Maximum Contaminant Level	<	Less than Result value
	>	Greater than Result value	B	Analyte detected in the associated Method Blank
	E	Estimated value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified
Rpt Lim		Reporting Limit	S	Spike Recovery outside limits due to matrix
			BRL	Not detected at MDL

ENCLOSURE 2

**DATA VALIDATION-QUALIFIED FIXED LABORATORY ANALYTICAL RESULTS FOR
ANALYTICAL ENVIRONMENTAL SERVICES, INC., REPORT NOS. 0812E02 AND 0812E77**

(Two Pages)

**ANALYTICAL RESULTS FOR SAMPLES IN REPORT NOS. 0812E02 AND 0812E77
RICHARDS METAL PLATING RESPONSE**

Sample Designation:	Industrial	Industrial	RP-CORE-4 A	RP-CORE-4 B	RP-CORE-5 A	RP-CORE-6 A	RP-CORE-6 B
Sample Collection Date:	RSL	RAL	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Percent Moisture							
Percent Moisture	NE	NE	22.8	28.4	28.4	19.1	30.8
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	25.7 J	34.9 J	276 J	0.766 J	1.45 UJ
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	7.40	7.79	11.5	4.96	9.73
Barium	100,000	681,000	49.4	64.4	47.3	158	91.5
Cadmium	564	2,700	3 U	2.84 U	2.81 U	82.9	1.18 J
Chromium	498	154,000	1310	4230	1780	81.3	49.3
Chromium (III)	100,000	154,000	1284.3 J	4195.1 J	1504 J	80.534 J	49.3
Lead	800	800	14.1	28.4	14.2	127	273
Mercury	340	93	0.0710 J	0.0734 J	0.0686 J	0.0849 J	0.165
Silver	5,677	17,000	0.150 J	0.193 J	1.11 J	1.89 J	0.0700 J

Sample Designation:	Industrial	Industrial	RP-SD-01	RP-SD-02	RP-SD-03	RP-SS-01	RP-SS-02
Sample Collection Date:	RSL	RAL	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Percent Moisture							
Percent Moisture	NE	NE	11.1	15.8	18.8	29.9	32.0
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	54.3 J	0.0950 J	1.21 UJ	1.37 UJ	1.36 UJ
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	7.36	3.27 J	3.16 J	8.33	6.77
Barium	100,000	681,000	30.3	65.0	32.3	108	44.6
Cadmium	564	2,700	0.160 J	0.0994 J	0.156 J	0.274 J	0.164 J
Chromium	498	154,000	2840	806	44.2	20.7	40.2
Chromium (III)	100,000	154,000	2785.7 J	805.905 J	44.2	20.7	40.2
Lead	800	800	27.2	215	442	145	44.9
Mercury	340	93	0.112 U	0.116 U	0.209	0.238	0.144 U
Selenium	5,677	17,000	4.46 U	5.55 U	5.26 U	0.781 J	4.41 U
Silver	5,677	17,000	0.0335 J	2.77 U	2.63 U	3.18 U	2.21 U

Notes:

Indicates detection at level exceeding the RSL

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

RAL= EPA Region 4 Removal Action Level

RSL= EPA 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria

**ANALYTICAL RESULTS FOR SAMPLES IN REPORT NOS. 0812E02 AND 0812E77
RICHARDS METAL PLATING RESPONSE**

Sample Designation:	Industrial	Industrial	RP-SS-03	RP-SS-04	RP-SS-05	RP-SS-06	RP-SS-07
Sample Collection Date:	RSL	RAL	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Percent Moisture							
Percent Moisture	NE	NE	35.6	19.5	20.4	24.6	9.16
Hexavalent Chromium	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hexavalent Chromium	71	10,000	1.30 J	42.6 J	2.12 J	1.33 UJ	7.33 J
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic	1.8	177	5.42	4.40 J	3.97 J	4.96 J	7.21
Barium	100,000	681,000	49.5	67.1	49.3	59.2	98.0
Cadmium	564	2,700	0.264 J	0.896 J	0.163 J	0.554 J	0.100 J
Chromium	498	154,000	308	525	137	168	6390
Chromium (III)	100,000	154,000	306.7 J	482.4 J	134.88 J	168	6382.67 J
Lead	800	800	158	35.6	89.8	107	361
Silver	5,677	17,000	0.0266 J	0.239 J	2.47 U	2.99 U	0.361 J

Sample Designation:	RP-COUNT
Sample Collection Date:	16-Dec-08
Hexavalent Chromium	mg/L
Hexavalent Chromium	0.002 UJ
Metals	mg/kg
Chromium	3.4
Mercury	0.0099 U
Characteristic Parameters	
Corrosivity (pH Units)	NA

Notes:

Indicates detection at level exceeding the RSL

mg/kg = Milligrams per kilogram

J = The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

RAL= EPA Region 4 Removal Action Level

RSL= EPA 2008 Regional Screening Levels for Chemical Contaminants at Superfund Sites

U = The analyte was analyzed for, but was not detected at or above the associated value.

UJ = The analyte was analyzed for, but was not detected at or above the associated value, which is considered approximate due to deficiencies in one or more quality control criteria.

APPENDIX F

CONTAINER INVENTORY (Five Pages)

CONTAINER INVENTORY
RICHARD'S METAL PLATING RESPONSE
VAT INVENTORY

Container ID	Container Type	Length (ft)	Width (ft)	Depth (ft)	Liquid Depth (ft)	Sludge Depth (ft)	Gallons of Liquid	Liquid Waste Stream	Gallons of Sludge	Sludge Waste Stream	pH	Oxid	Comments
V-01	Vat	8	1.5	1.5	0	0.75	0	--	67	Solid Neutral Metals	9.8	No	
V-02	Vat	9	3	4	0	1	0	--	202	Unknown	--	--	Could not sample
V-03	Vat	9	3	4	3	1.5	607	Liquid Neutral Metals	303	Solid Neutral Metals	5.96	No	
V-04	Vat	8	3	2	0.25	0	45	Liquid Neutral Metals	0	--	9.5	No	
V-05	Vat	8	2	3	1.5	0	180	Liquid Acidic Metals	0	--	0.77	Yes	
V-06	Vat	8	3	2	--	--	--	--	--	--	--	--	Empty
V-07	Vat	8	4	5	0	0.5	0		120	Unknown			Could not sample
V-08	Vat	--	--	--	--	--	--	--	--	--	--	--	Could not sample
V-09	Vat	8	5	4	--	--	--	--	--	--	--	--	Empty
V-10	Vat	9	6.5	4.5	4.5	0	1972	Liquid Neutral Metals	0	--	3.1	Yes	
V-11	Vat	9	3	4.5	2.5	0.1666	506	Liquid Acidic Metals	34	Solid Acidic Metals	1.5	Yes	
V-12	Vat	9	4	4	2	0	539	Liquid Neutral Metals	0	--	5.8	No	
V-13	Vat	9	4	4	2	0	539	Liquid Neutral	0	--	5.8	No	
V-14	Vat	9	3	4	2	0	404	Liquid Neutral Metals	0	--	5.68	No	
V-15	Vat	9	3	4	--	--	--	--	--	--	--	--	Empty

**CONTAINER INVENTORY
RICHARD'S METAL PLATING RESPONSE
VAT INVENTORY**

Container ID	Container Type	Length (ft)	Width (ft)	Depth (ft)	Liquid Depth (ft)	Sludge Depth (ft)	Gallons of Liquid	Liquid Waste Stream	Gallons of Sludge	Sludge Waste Stream	pH	Oxid	Comments
V-16	Vat	9	3	3	0	0.1666	0	--	34	Unknown	--	--	Could not sample
V-17	Vat	9	3	4	2	0	404	Liquid Acidic Metals	0		1.17	No	
V-18	Vat	9	3	5	2.5	0	506	Liquid Neutral	0		10.4	No	
V-19	Vat	9	5	3	2.25	0	758	Liquid Neutral	0		10.2	No	
V-20	Vat	2	2	1.5	1.5	0	45	Liquid Neutral Metals	0		6.75	No	
V-21	Vat	8	4	6	6	0	1438	Liquid Neutral	0		4.03	No	
V-22	Vat	7	4	4	4	0	839	Liquid Neutral Metals	0		3.81	No	
V-23	Vat	2	2	1.5	1.5	0	45	Liquid Neutral	0		6.21	No	
V-24	Vat	2	2	1.5	1.5	0	45	Liquid Neutral	0		6.26	No	

Notes:

ft = Feet
Oxid = Oxidizer

**CONTAINER INVENTORY
RICHARD'S METAL PLATING RESPONSE
DRUM INVENTORY**

Container ID	Drum Type	Percent (%) Full	Container Volume (gallons)	Number of Containers	Total Volume	pH	Oxidizer	State	Preliminary Waste Stream	Comments
D001	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D002	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D003	Plastic	75%	55	1	41	7	No	Liquid	Neutral Liquids	
D004	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D005	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D006	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D007	Plastic	75%	15	17	191	5	No	Liquid	Neutral Liquids	
D024	Plastic	50%	55	1	28	14	No	Liquid	Basic Liquids	
D025	Plastic	25%	55	1	14	14	No	Liquid	Basic Liquids	
D026	Plastic	100%	55	1	55	7	Yes	Liquid	Oxidizing Liquids	
D027	Plastic	100%	55	1	55	--	--	Liquid	Neutral Liquids	No Sample Collected/ NiSO_4
D028	Plastic	100%	55	1	55	--	--	Liquid	Neutral Liquids	No Sample Collected/ NiSO_4
D029	Plastic	100%	55	1	55	4	No	Liquid	Neutral Liquids	
D030	Plastic	100%	55	1	55	--	--	Liquid	Neutral Liquids	No Sample Collected/ NiSO_4
D031	Steel	75%	55	1	41	5		Liquid	Flammable Liquids	
D032	Plastic	33%	55	1	18	--	--	Liquid	Neutral Liquids	No Sample Collected/ NiSO_4
D033	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D034	Fiber	33%	55	1	18	3	No	Liquid	Neutral Liquids	
D035	Fiber	50%	55	1	28	7	No	Liquid	Neutral Liquids	
D036	Fiber	100%	55	1	55	4	No	Liquid	Neutral Liquids	
D037	Steel	100%	55	1	55	1	No	Liquid	Acid liquids	
D038	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D039	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D040	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D041	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D042	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D043	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D044	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D045	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	

CONTAINER INVENTORY
RICHARD'S METAL PLATING RESPONSE
DRUM INVENTORY

Container ID	Drum Type	Percent (%) Full	Container Volume (gallons)	Number of Containers	Total Volume	pH	Oxidizer	State	Preliminary Waste Stream	Comments
D046	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D047	Plastic	25%	55	1	14	1	No	Liquid	Acid liquids	
D048	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D049	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D050	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D051	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D052	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D053	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D054	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D055	Fiber	100%	55	1	55	--	--	Solid	Nickel Additive Solid	
D056	Plastic	--	55	1	--	--	--	--	Unknown	Could Not Sample
D057	Plastic	100%	55	1	55	14	No	Liquid	Basic Liquids	
D058	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D059	Plastic	75%	55	1	41	14	No	Liquid	Basic Liquids	
D060	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D061	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D062	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D063	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D064	Plastic	--	5	1	--	--	--	--	Unknown	Could Not Sample
D065	Plastic	25%	55	1	14	1	No	Liquid	Acid liquids	
D066	Plastic	100%	55	1	55	8	No	Liquid	Neutral Liquids	
D067	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	
D068	Plastic	25%	5	1	1	1	No	Liquid	Acid liquids	
D069	Plastic	25%	5	1	1	1	Yes	Liquid	Acid liquids	
D070	Plastic	33%	5	1	2	7	No	Liquid	Neutral Liquids	
D071	Plastic	100%	5	2	10	7	No	Liquid	Neutral Liquids	
D072	Plastic	75%	5	1	4	7	No	Liquid	Neutral Liquids	
D073	Plastic	100%	5	8	40	7	No	Liquid	Neutral Liquids	
D074	Plastic	100%	5	8	40	7	No	Liquid	Neutral Liquids	
D075	Plastic	100%	5	1	5	--	--	--	Nickel Purifier (Label)	No Sample Collected
D076	Steel	100%	5	4	20	--	--	--	Buffing Wheel Cement (Label)	Could Not Sample
D077	Plastic	100%	5	1	5	--	--	--	Unknown	Could Not Sample
D078	Plastic	75%	5	4	15	14	No	Liquid	Basic Liquids	

CONTAINER INVENTORY
RICHARD'S METAL PLATING RESPONSE
DRUM INVENTORY

Container ID	Drum Type	Percent (%) Full	Container Volume (gallons)	Number of Containers	Total Volume	pH	Oxidizer	State	Preliminary Waste Stream	Comments
D079	Plastic	100%	5	5	25	--	--	--	Nickel Brightener B-70 (Label)	No Sample Collected
D080	Plastic	100%	3	2	6	7	No	Liquid	Neutral Liquids	
D081	Plastic	75%	5	1	4	7	No	Liquid	Neutral Liquids	
D082	Plastic	75%	5	2	8	7	No	Liquid	Neutral Liquids	
D083	Plastic	75%	5	2	8	5	No	Liquid	Neutral Liquids	
D084	Plastic	75%	5	1	4	7	No	Liquid	Neutral Liquids	
D085	Plastic	75%	5	4	15	7	No	Liquid	Neutral Liquids	
D086	Plastic	75%	5	11	41	7	No	Liquid	Neutral Liquids	
D087	Plastic	75%	5	3	11	3	No	Liquid	Neutral Liquids	
D088	Plastic	75%	5	4	15	7	No	Liquid	Neutral Liquids	
D089	Plastic	75%	5	2	8	7	No	Liquid	Neutral Liquids	
D090	Fiber	66%	55	1	36	14	No	Liquid	Basic Liquids	
D091	Fiber	33%	55	1	18	--	No	--	Unknown	No pH Data
D092	--	--	--	1	--	--	--	--	Unknown	Could Not Sample
D093	Plastic	50%	5	1	3	7	Yes	Liquid	Oxidizing Liquids	
D094	Plastic	100%	5	1	5	7	No	Liquid	Neutral Liquids	
D095	Plastic	100%	5	1	5	8	No	Liquid	Neutral Liquids	
D096	Plastic	100%	5	1	5	7	No	Liquid	Neutral Liquids	
D097	Plastic	100%	5	1	5	7	No	Liquid	Neutral Liquids	
D098	Plastic	100%	5	1	5	1	No	Liquid	Acid liquids	
D099	Plastic	100%	5	1	5	7	No	Liquid	Neutral Liquids	
D100	Plastic	33%	5	1	2	7	No	Liquid	Neutral Liquids	
D101	Plastic	25%	5	1	1	7	No	Liquid	Neutral Liquids	
D102	Plastic	33%		1	0	13	No	Liquid	Basic Liquids	
D103	Plastic	100%	5	1	5	7	Yes	Liquid	Oxidizing Liquids	
D104	Plastic	100%	5	1	5	7	No	Liquid	Neutral Liquids	
D105	Plastic	100%	55	1	55	7	No	Liquid	Neutral Liquids	

Note:

NiSO₄ = Nickel sulfate

APPENDIX G

TABLE OF WITNESSES (One Page)

**RICHARDS METAL PLATING
TABLE OF WITNESSES**

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