



**NASA AREA OF INVESTIGATION 14  
FORMER SOIL FILL AREAS**

**FINAL INTERIM CORRECTIVE ACTION  
MEASURES COMPLETION REPORT**

**NASA Ames Research Center  
Moffett Field, CA**

**June 2014**



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FORMER SOILS FILL AREA**

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MEASURES COMPLETION REPORT**

June 2014

Prepared for:

NASA Ames Research Center  
Environmental Management Division  
Mail Stop 204-15  
Moffett Field, California 94035-1000

Prepared by:



Mail Stop T20G-4  
NASA Ames Research Center  
Moffett Field, California 94035-1000

# NASA AREA OF INVESTIGATION 14 FORMER SOIL FILL AREAS

## INTERIM CORRECTIVE ACTION MEASURES COMPLETION REPORT

Prepared by:



Earth Resources Technology, Inc.  
NASA Ames Research Center  
Moffett Field, California 94035-1000

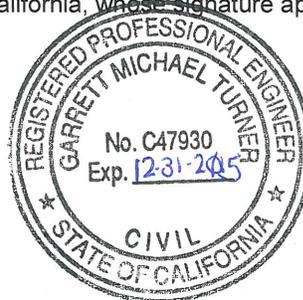
A handwritten signature in black ink, appearing to read "K. Finch", written over a horizontal line.

Kimberly Finch  
NASA Ames Project Coordinator

This document was prepared by Earth Resources Technology, Inc. on behalf of NASA Ames Research Center. The document is based upon available information and was prepared in accordance with currently accepted professional practices at the time and location of the work. No other warranty is implied or intended. This document was prepared for the sole use of NASA Ames Research Center, the only intended beneficiary of the work. The information in this document is only to be used for the intended project. The work contained herein was conducted under the direct supervision of the Professional Engineer, registered with the State of California, whose signature appears below.

A handwritten signature in blue ink, appearing to read "Garrett Michael Turner", written over a horizontal line.

Garrett Michael Turner, P.E.  
Certificate No. C47930



5-1-2014

Date

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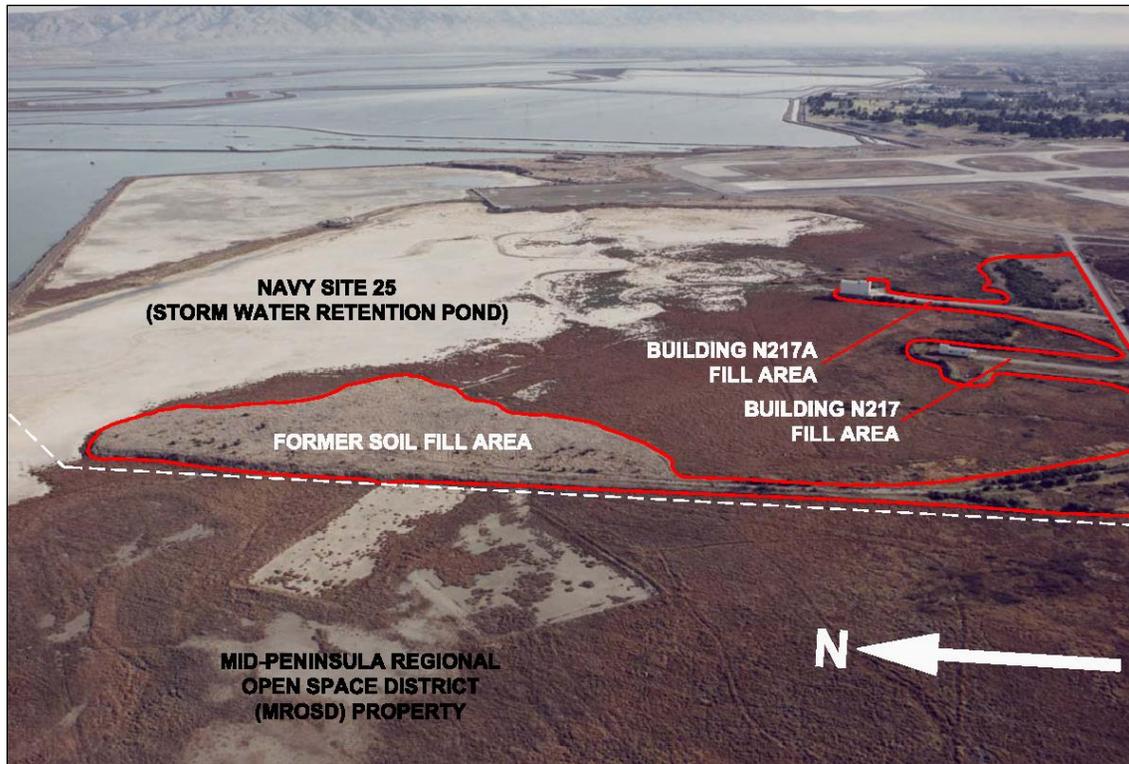
## 1.0 INTRODUCTION

At the request of the National Aeronautics and Space Administration Ames Research Center (NASA Ames), Earth Resources Technology, Inc. (ERT) has prepared this Interim Corrective Action Measures (ICAM) Completion Report (CR) for the Area of Investigation (AOI) 14 Former Soils Fill Area (FSFA). The ICAM consisted of installation of erosion control silt fencing around the 8-acre portion of the AOI 14 FSFA. This CR documents completion of ICAM activities and presents the results of associated baseline sampling in accordance with the “*NASA Area of Investigation 14 Interim Corrective Action Measures Work Plan, Former Soil Fill Areas (ERT, October 2013).*”

NASA Ames is a federal aerospace research facility located in Santa Clara County California, 35 miles southeast of San Francisco and 10 miles northwest of San Jose at the southern end of the San Francisco Bay. The AOI 14 FSFA is located on the northern portion of NASA Ames. Figure 1 illustrates the location of AOI 14 with respect to Navy Site 25, while Figure 2 presents an aerial view of the fill areas, the surrounding wetland areas of Navy IR Site 25 and the Mid-Peninsula Regional Open Space District (MROSD).



**Figure 1**  
**AOI 14 Site Location**



**Figure 2**  
**AOI 14 Aerial View (1991 Photograph)**

## **2.0 BACKGROUND**

In March 2013, EPA issued a Unilateral Administrative Order (UAO) requiring NASA Ames to implement interim and long-term response actions at AOI 14 to stabilize and address soil contamination (RCRA-7003-09-2013-0002). AOI 14 encompasses three peninsula fill areas consisting of the 8-acre fill area, the Building N217 fill area and the Building N217A fill area, collectively referred to as 'AOI 14 FSFA.'

The storm water retention pond/wetlands area adjacent to AOI 14 FSFA, designated Navy Installation Restoration (IR) Site 25, contained chemicals of concern in sediment above the Site 25 ecological remediation goals shown in Table 1. Remedial Action at Navy IR Site 25 consisting of sediment removal and offsite disposal was completed in 2012 (*Final Remedial Action Completion Report, Remedial Action at IR Site 25, ITSI Gilbane Company, July 2013*).

**Table 1**  
**Site-Specific Sediment Remediation Goals**  
**Navy IR Site 25**

Chemical of Concern	Site-Specific Sediment Remediation Goal (mg/kg) <sup>1</sup>
PCBs (total) <sup>2</sup>	0.210
DDT (total) <sup>3</sup>	0.109
Lead	93.8
Zinc	314

mg/kg = milligrams per kilogram or parts per million (ppm)

PCB = Polychlorinated Biphenyl

DDT = Dichlorodiphenyltrichloroethane

<sup>1</sup> source: “*Final Remedial Action Completion Report, Remedial Action at IR Site 25, ITSI Gilbane Company, July 2013*”

<sup>2</sup> includes Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1268

<sup>3</sup> includes DDT, DDD, and DDE

Detailed in the AOI 14 ICAM Work Plan, historical soil sampling adjacent to and within the AOI 14 FSFA indicates the presence of the chemicals of concern (COCs) PCBs, total DDT, lead and zinc in the fill soils. COCs above Site 25 sediment remediation goals are present primarily within the surface soils of the larger 8-acre fill peninsula. As documented in the “*Draft Area of Investigation 14 N217 & N217A Fill Areas Interim Corrective Action Measures Data Gap Soil Sampling Report of Findings (ERT, December 2013)*,” silt fencing was not installed around the N217 and N217A fill areas because contaminants present at depth in these areas do not present a risk to burrowing animals or to the surrounding environment through erosion of surface soil.

### 3.0 SITE DESCRIPTION

The thickness of the 8-acre FSFA varies from approximately four feet at the southern end to approximately 16 feet at the northern end. The Building N217 and N217A fill areas vary from approximately four feet at the southern ends to 10 feet at the northern ends. Groundcover across the three peninsulas varies and includes tall grasses and low-lying brush. The location of AOI 14 is shown on Figure 1.

### 4.0 INTERIM CORRECTIVE ACTION MEASURES

The objective of the ICAM is to prevent risks to the environment by controlling and monitoring potential soil erosion from the existing 8-acre FSFA fill peninsula into the surrounding wetlands area. Based on the presence of contaminated soil located within and near the boundaries of the 8-acre FSFA, NASA installed an erosion control barrier along the base of the 8-acre FSFA to prevent potential erosion of known COC-contaminated soil into the surrounding wetlands area that has been remediated by the Navy to levels safe for unrestricted use and exposure.

Multiple efforts were expended prior to and during installation of the silt fencing. Major mobilization activities included the following:

- Consultation with natural resource trustees U.S. Fish and Wildlife Service (USFWS), Mid-Peninsula Regional Open Space District (MROSD) and US Army Corp of Engineers.
- A biological site assessment walk with the USFWS, Elizabeth Wells of the Regional Water Quality Control Board, and an ITSI Gilbane representative (silt fence installation contractor). Discussions included proposed location of silt fencing, spacing requirement for installation of “mouse bridges” and potential mitigation requirements.
- Pre-silt fence installation job walk with NASA and ITSI Gilbane personnel.
- Pre-mobilization mowing of tall standing vegetation around the top of the fill area and the subcontractor equipment staging area for access purposes.

#### **4.1 Erosion Control Barrier Installation**

The approved erosion control measure was installed from December 17<sup>th</sup> through December 19<sup>th</sup>, 2013 and consists of approximately 2,000 linear feet of double layer silt fence sediment barrier placed adjacent to the base of the 8-acre FSFA. The southern portion of the 8-acre fill peninsula is not known to contain COCs above the Site 25 sediment remediation goals and was not fenced as part of this ICAM. ITSI Gilbane, the Navy Site 25 contractor, provided equipment, materials and personnel for the silt fence installation. The location and details of the installed fencing are provided in Attachment 1.

In accordance with the USFWS Emergency Consultation (Attachment 2), NASA Ames’ wildlife biologist, Chris Alderete, completed a site survey prior to installation of the silt fencing. The survey was conducted to determine the presence/absence of wetlands wildlife, in particular the salt marsh harvest mouse (SMHM), either on or adjacent to the fill peninsula, and the extent of pickle-weed habitat. The SMHM was not observed during the pre-installation survey. A mouse was observed during fence installation, however the mouse species was not determined. Mr. Alderete was present for the duration of the entire silt fence installation primarily to monitor for the presence of the SMHM and to ensure the correct installation of the USFWS stipulated access/egress “mouse bridges” (see Attachment 3 for photographs showing “mouse bridges”). During fence installation, Mr. Alderete was present to “flush out” potential SMHM through 5-foot fencing gaps located along every 200-feet of fencing prior to closure of these gaps. In addition, Mr. Alderete directed the removal of the Navy Site 25 fencing that remained around the periphery of the fill peninsula potentially acting as a secondary barrier to the SMHM.

Fence installation work was monitored by NASA contract personnel during construction. NASA environmental and facilities contract personnel, and ITSI Gilbane field staff inspected the completed silt fence installation on December 19, 2013. Inspection elements included depth of fence staking, burial depth of double-walled fence material, replacement of trenched soils at ground level along both sides of fence surfaces, competency of fencing stakes, stapling of fence material to posts,

correct spacing and installation of “mouse bridges”, and replacement of disturbed pickleweed. The inspection confirmed that there were no significant deviations from the ICAM WP specifications. Photographs taken from December 17-19, 2013 are also included in Attachment 3.

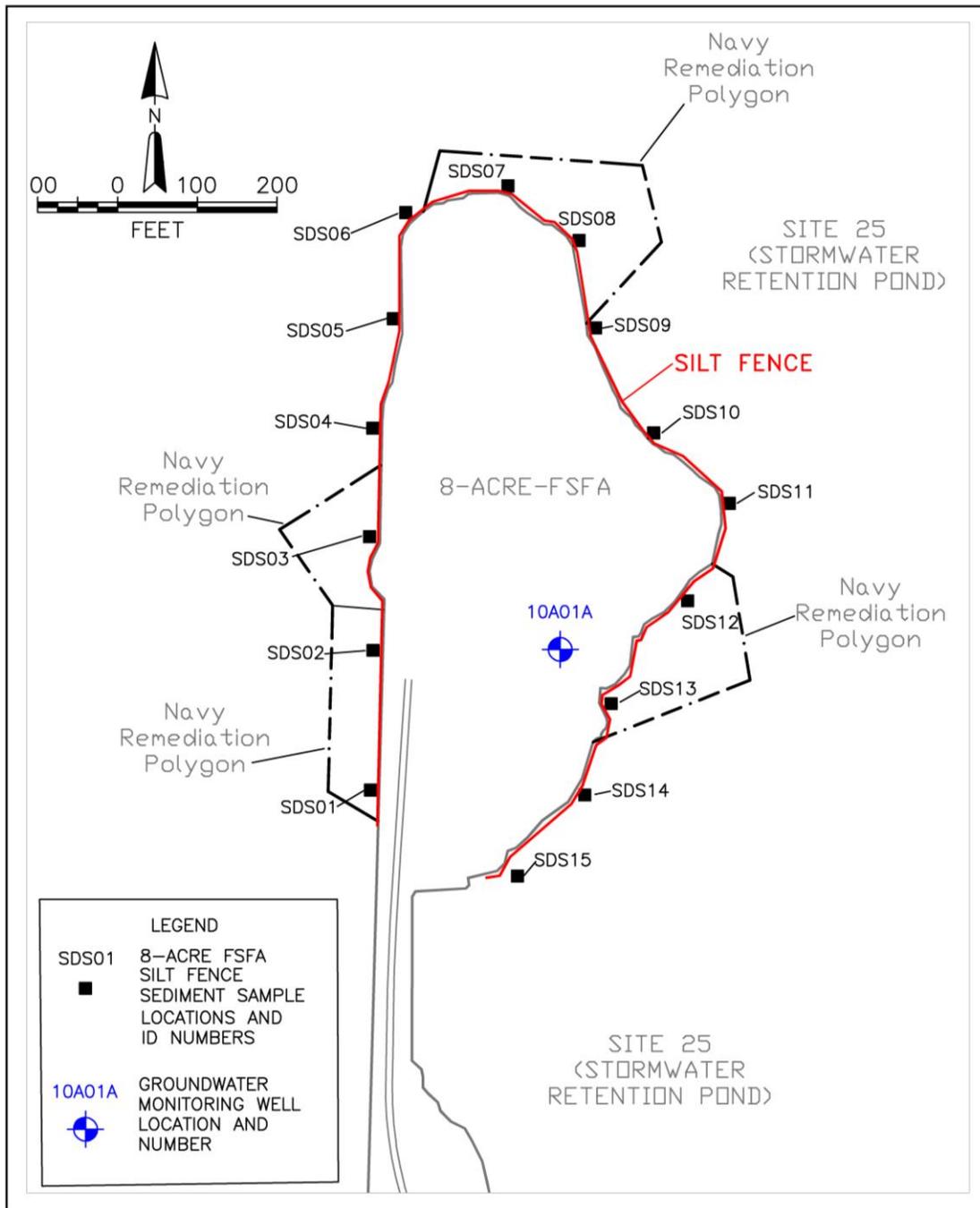
#### **4.2 Baseline Sediment Sampling**

Baseline sediment samples were collected on December 20, 2013 post installation of the silt fence. Fifteen (15) surface sediment samples and one duplicate sample were collected within 5 feet of the exterior of the fencing from the locations shown on Figure 3. At each sample location, a steel fence post was placed to ensure annually repeatable sediment sample collection locations. Sediment samples were collected, labeled, stored and shipped as per the approved ICAM WP.

Per the ICAM Work Plan, annual sediment samples will be collected in September, depending on water levels in the adjacent wetlands areas. The annual sediment sampling results will be included in the 3<sup>rd</sup> quarterly report due October 31.

Several minor rainfall events occurred during the fall 2013 timeframe. These included 0.50 inches total in September, 0.01 inches in October, and 0.59 inches in November. Pre-silt fence installation site visits occurred on August 28, September 9, 19, 23 (post 0.50 inches), October 28, and November 22 (post 0.59 inches). As noted during the 2014 site silt fence inspections, there was no visual evidence of surface sediment erosion entering the surrounding wetlands areas during these rain events. Since the 8-acre fill peninsula is fully vegetated on both the upland surfaces and side slopes, excessive rainfall sufficient to cause erosion of surface soils has not been observed, even when rainfall has exceeded 1 inch in a 24 hour period (2/28/14).

As stated in the AOI 14 ICAM WP, quarterly letter reports of silt fence integrity inspections and conditions, including rain event inspections, will be submitted by close of business January 31, April 30, July 31, and October 31 during the calendar year.



**Figure 3**  
**AOI 14 FSFA Silt Fence and Baseline Sample Locations**

Table 2 summarizes the sediment sample analytical results. COCs were not detected above the Site 25 sediment remediation goals in any sample. Samples from locations SDS02, SDS03 and SDS12 had total chromium concentrations of 64 mg/kg, 110 mg/kg and 70 mg/kg respectively. The two samples with the highest total chromium levels, SDS03 and SDS12, were also analyzed for hexavalent chromium (Cr VI). Since CR VI was not detected in either sample, the detected total chromium is chromium III (action level of 750 mg/kg). All other chromium detections were below the Site 25 sediment remediation goal of 58 mg/kg. A copy of the baseline sediment analytical results is included as Attachment 4.

**Table 2  
Baseline Sediment Samples Analytical Results Summary**

Sample Location	Depth (bgs)	Aroclor 1260 (µg/kg)	Aroclor 1268 (µg/kg)	Total PCBs (µg/kg)	Total DDT (µg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Chromium (total) (mg/kg)
SDS01	0-6"	<20	<20	<20	<75	8.5	53	52
SDS02	0-6"	<20	<20	<20	<75	17	39	64
SDS03	0-6"	<20	<20	<20	<75	24	36	110
SDS04	0-6"	30	<20	30	<75	13	32	26
SDS05	0-6"	22	<20	22	<75	18	62	21
SDS06	0-6"	68	<20	68	<75	15	44	30
SDS07	0-6"	<20	<20	<20	<75	14	21	23
SDS08	0-6"	110	<20	110	<75	15	25	42
SDS09	0-6"	<20	<20	<20	<75	<13	21	7.9
SDS10	0-6"	24	<20	24	<75	11	55	54
SDS11	0-6"	28	<20	28	<75	20	39	27
SDS11K	0-6"	<20	<20	<20	<75	17	47	51
SDS12	0-6"	100	<20	100	<75	32	96	70
SDS13	0-6"	<20	<20	<20	<75	16	35	55
SDS14	0-6"	21	<20	21	<75	17	36	29
SDS15	0-6"	34	<20	34	<75	27	36	29
<b>Sediment Remediation Goal</b>		<b>210</b>	<b>210</b>	<b>210</b>	<b>109</b>	<b>93.8</b>	<b>314</b>	<b>58</b>

Note: The symbol "<" designates a value less than the reporting limit (e.g. <13 = less than 13 mg/kg).

## 5.0 SUMMARY

Installation of the AOI 14 FSFA silt fence soil erosion control barrier has been completed and post-installation baseline sediment samples were collected and analyzed in accordance with the approved ICAM Work Plan. COCs detected in the baseline sediment samples were below Navy IR Site 25 sediment remediation goals.

As stipulated in the approved AOI 14 ICAM WP, monthly and post rain event inspections will be conducted to monitor the effectiveness and condition of the silt fence barrier. Inspection and photographic documentation will be provided in quarterly letter reports to the EPA. Additional steps to repair or reinforce the silt fence will be implemented if it is determined that such actions are required to maintain the integrity of the fencing. EPA will be notified of such required actions.

Annual sediment sampling results will be compared to Navy IR Site 25 sediment remediation goals as a measure of the ICAM performance. Trends in annual sample results compared to the baseline sample results will also be considered. The annual sediment sampling results will be reported to the EPA as specified in the approved AOI 14 ICAM Work Plan.

## **6.0 REFERENCES**

Earth Resources Technology, Inc. (ERT), 2013, *NASA Area of Investigation 14, Interim Corrective Action Measures Work Plan, Former Soil Fill Areas, NASA Ames Research Center, Moffett Field, California.*

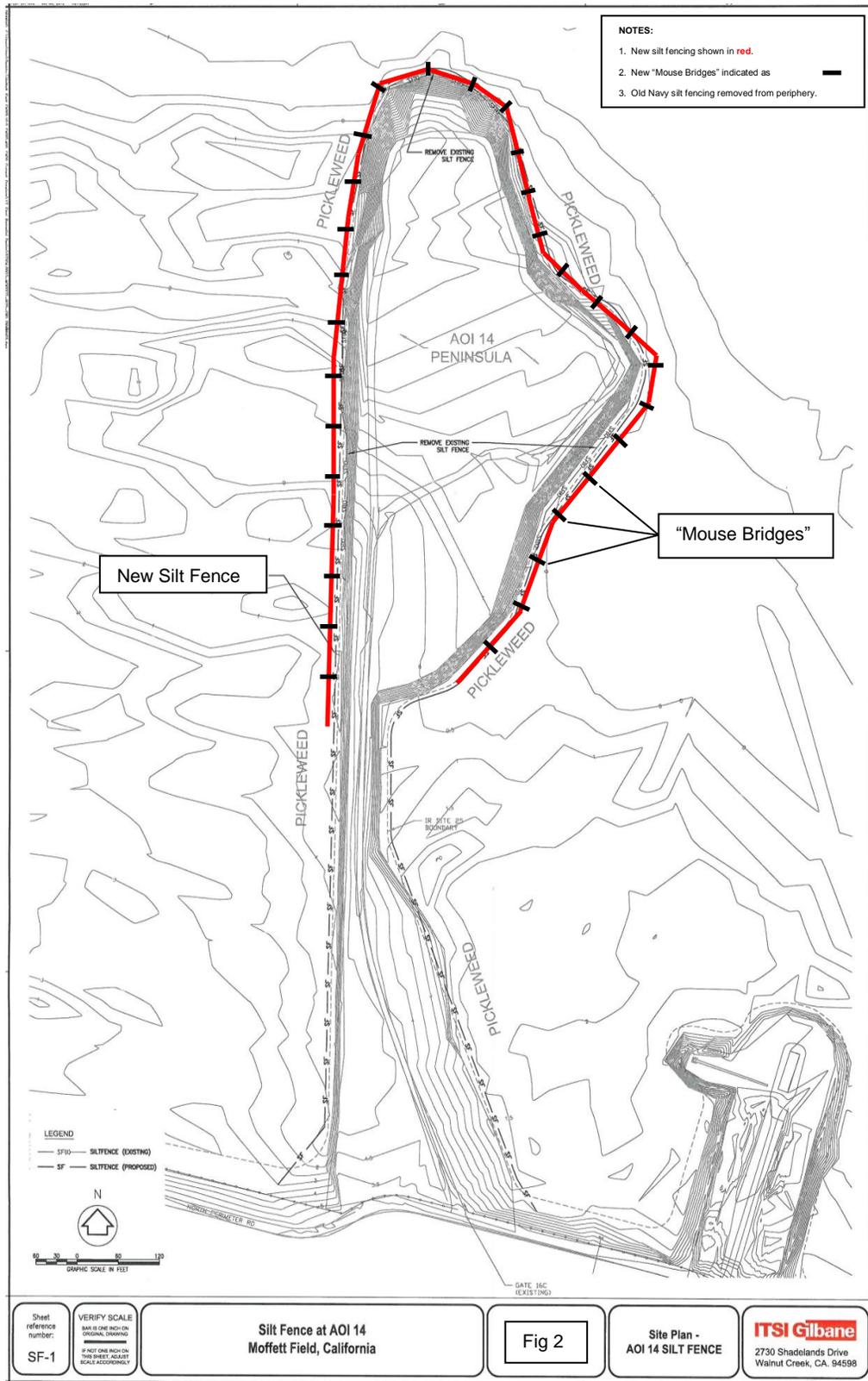
ERT, 2013 *Draft Area of Investigation 14 N217 & N217A Fill Areas Interim Corrective Action Measures Data Gap Soil Sampling Report of Findings, NASA Ames Research Center, Moffett Field, California.*

EPA, 2013. *USEPA Region IX, Unilateral Administrative Order, U.S. EPA Docket No. RCRA-7003-09-2013-0002, Former Soils Fill Area, NASA Ames Research Center, Moffett Field, California.*

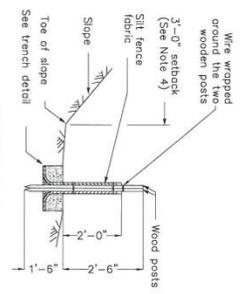
ITSI Gilbane Company, July 2013, *Final Remedial Action Completion Report, Remedial Action at IR Site 25.*

# ATTACHMENT 1

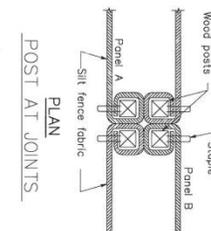
## Silt Fence As-Built Figures



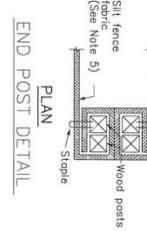
**8-Acre FSFA Silt Fencing Location**  
 (AOI 14 ICAM Silt Fencing in Red)



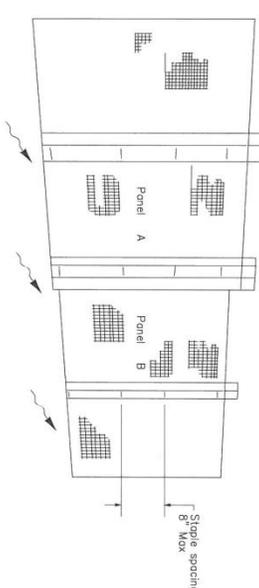
SECTION A-A  
TEMPORARY SILT FENCE



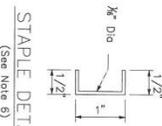
POST AT JOINTS  
PLAN



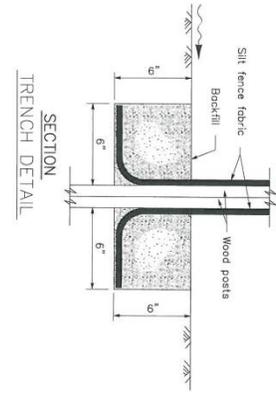
END POST DETAIL  
PLAN



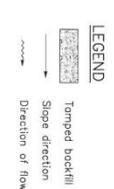
PERSPECTIVE  
SILT FENCE PANELS AT JOINTS



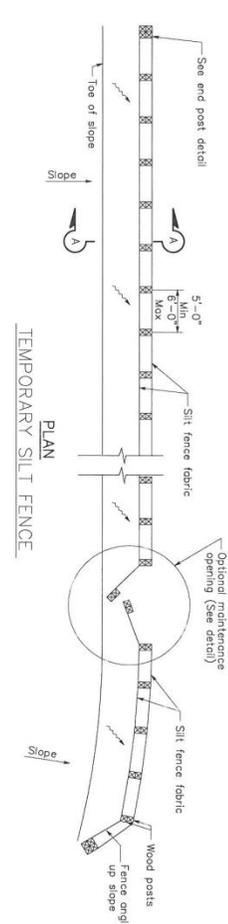
STAPLE DETAIL  
(See Note 6)



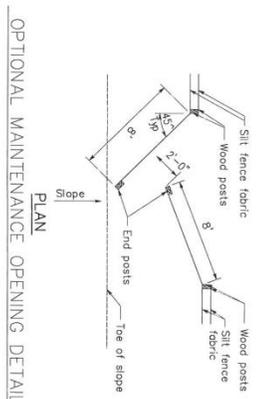
SECTION  
TRENCH DETAIL



- NOTES:**
1. Install temporary silt fence by first digging trench, driving posts, placing and securing fabric. Then backfill and tamp.
  2. Posts to overlap and fence fabric to fold around each post one full turn. Secure fabric with 4 staples for each post.
  3. Posts shall be driven tightly together to prevent access by other with wire.
  4. Setback dimensions may vary to fit field conditions.
  5. For each end post, fence fabric shall be folded around two posts one full turn and secured with 4 staples.
  6. Minimum of 4 staples shall be installed per post. Dimensions shown are typical.



TEMPORARY SILT FENCE  
PLAN



OPTIONAL MAINTENANCE OPENING DETAIL  
PLAN

<p>Sheet reference number: <b>CD-1</b></p>	<p><b>VERIFY SCALE</b> BASE IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY</p>	<p><b>Silt Fence at AOI 14 Moffett Field, California</b></p>	<p>Proposal to NASA October 2012</p>	<p><b>AOI 14 SILT FENCE DETAILS</b></p>	<p><b>ITSI Gilbane</b> 2730 Shadelands Drive Walnut Creek, CA. 94598</p>
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# ATTACHMENT 2

## USFWS Emergency Consultation



Reply to Attn of:

JQ:204-15

SEP 25 2013

Mr. Ryan Olah  
Division Chief  
Coast Bay/Forest-Foothills Division  
U.S. Fish and Wildlife Service  
Sacramento Fish and Wildlife Office  
2800 Cottage Way, W-2605  
Sacramento, CA 95825

Dear Mr. Olah:

In October of 2013, NASA Ames Research Center is planning to install up to 5,300 linear feet of silt fencing around portions of NASA's Area of Investigation (AOI) 14 in response to emergency conditions at the site. If fencing is not in place before the first rains of the season, then contamination of surrounding areas by eroded soils and sediments will degrade habitat for wildlife such as the Federally Endangered salt marsh harvest mouse. This evaluation is supported by the fact that the work is pursuant to Unilateral Administrative Order (Docket No. RCRA-7003-09-2013-0002) from the U.S. Environmental Protection Agency (EPA), which states that current unfenced conditions pose an "imminent and substantial endangerment to the environment."

Due to these emergency conditions, NASA is requesting an emergency formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) for the federally listed endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) on these interim measures to install silt fencing around the site. This letter serves to initiate emergency formal consultation. Pending confirmation of receipt of this letter, NASA will then undertake the project, including avoidance and minimization measures outlined below, and keep the Service informed of the status and schedule of work at the site.

NASA's AOI 14 consists of three fill peninsulas in a Storm Water Retention Pond (SWRP). The peninsulas and surrounding area includes mud flats, wetlands, pickleweed habitat, and upland refugia for the salt marsh harvest mouse. NASA is currently finalizing plans for the interim measure of silt fence installation around AOI 14 ("Phase 1"). Depending on the EPA's response to NASA's proposed work plan, Phase 1 will be limited to fencing around the northern portion of the western most peninsula ("Option 1") and require up to 2,300 linear feet of fencing. If the EPA requires fencing around all three peninsulas, Option 2 would be to include installation of fencing around the two eastern peninsulas as well, requiring up to 5,300 linear feet of fencing. In the event that NASA is

required to install Option 2 fencing, NASA will initiate a separate emergency formal consultation with the Service for the additional fencing.

Option 1 could affect up to one-sixth of one acre of pickleweed habitat, out of approximately 44 acres of total pickleweed within the SWRP, and up to 5.4 acres of upland refugia, out of a total of 32.2 acres. Option 2 could affect up to one-third of one acre of pickleweed habitat and up to 11.6 acres of upland refugia.

In either case, NASA will implement the following avoidance and minimization measures:

- Pickleweed will be removed by hand where necessary for fence installation under the supervision of a Service-approved biologist.
- To limit barriers to salt marsh harvest mouse dispersal across the site, the silt fencing will be made of a fabric material that salt marsh harvest mice can climb, and;
- Fabric or corrugated plastic bridges will be placed every 50 ft. over those lengths of fence running through pickleweed.
- To prevent raptor perching, the silt fencing and bridges will be less than 4 feet high.
- A Service-approved biologist will monitor the site's fencing and salt marsh harvest mouse bridges to ensure that they do not serve as raptor perches. If found to act as perches, the biologist will inform NASA and NASA will in turn inform the Service.
- In the event that a salt marsh harvest mouse nest is found, a 50 ft. buffer will be maintained around the nest and work will stop until a Service-approved biologist has determined that the mice have weaned (typically 25 days).
- Construction equipment, including worker's boots, will be cleaned of soil, seeds, and plant material before entering the work site to prevent introduction of pepperweed (*Lepidium latifolium*). Workers will avoid walking through patches of pepperweed to the extent feasible.
- Site will be monitored by a Service-approved wildlife biologist to identify and remove pepperweed, if it is found within the Storm Water Retention Pond (SWRP).
- NASA will compensate for temporary effects to pickleweed and upland habitat for the salt marsh harvest mouse at a 1:1 ratio by controlling pepperweed and/or creating additional pickleweed habitat under a Service-approved plan.
- A pre-construction survey focused on the federally endangered California seablite (*Suaeda californica*) in the project footprint will be conducted prior to construction of the silt fence.
- Installation will occur outside the breeding and nesting season for the federally endangered California clapper rail (*Rallus longirostris obsoletus*) and threatened

Pacific coast population of the western snowy plover (*Charadrius alexandrinus nivosus*).

- A Service-approved Biological Monitor will be on-site for the duration of the project.
- The Service-approved Biologist shall conduct a pre-construction survey focused on Federally Threatened or Endangered species as well as daily surveys of the project footprint and action area, report findings to NASA.
- During silt fence installation, the biological monitor will be present. Areas to have silt fence installed will be flushed by the biological monitor prior to pickleweed removal, trenching, and silt fence installation. Silt fencing will be installed with 5 ft. gaps every 100 ft. until biologist walks through any remaining pickleweed on the peninsula side to flush any salt marsh harvest mice out the gaps. Gaps will have silt fence installed when the biologist verbally clears it.

Since the project to install silt fencing is an interim measure until the long-term cleanup resolves conditions at the site, NASA will continue coordination with the Service and reinitiate formal consultation in planning and implementing the long-term action (“Phase 2”). For Phase 2 cleanup, which requires removal of soil from the fill peninsulas, NASA will implement the following mitigation measures:

- NASA will coordinate with the Service on the work plan and reinitiate consultation to cover Phase 2.
- NASA will restore of all areas temporarily disturbed under a Service-approved revegetation and monitoring plan with success criteria.
- In addition to restoring all areas temporarily disturbed, NASA will compensate at a 3:1 ratio for effects to pickleweed and upland habitat by restoring/creating three times as much pickleweed habitat onsite under a Service-approved plan including conversion of uplands to pickleweed habitat and controlling pepperweed onsite.
- Visqueen (or equivalent) fencing will be placed on outside of fencing to prevent salt marsh harvest mice from entering work site.

In both Phases, the NASA will implement the following:

- The footprint of work within pickleweed will be kept to absolute minimum.
- The on-site biologist will have stop work authority, should any listed species be encountered.
- Construction crew will be briefed on the Listed Species concerns and procedures for reporting wildlife sightings.
- If a salt marsh harvest mouse or other federally listed species is observed during project, the onsite biological monitor has stop work authority and work will not continue in the immediate area until deemed clear by biologist and the Service has been contacted.

Attached to this letter is a copy of our Interim Corrective Action Work Plan for the site. Also attached is the resume of Chris Alderete who will be the wildlife biologist for the project.

If you have any questions, please contact Hugo Hoffman on my staff: 650-604-6787 or e-mail at [hugo.a.hoffman@nasa.gov](mailto:hugo.a.hoffman@nasa.gov) or me at 650-604-0237, e-mail at [donald.m.chuck@nasa.gov](mailto:donald.m.chuck@nasa.gov).

Cordially,



Donald M. Chuck  
Chief, Environmental Management Division

#### Attachments

cc: (electronically)

Ms. Yvonne Fong, UD EPA  
Ms. Bethany Dreyfus, US EPA  
Ms. Elizabeth Wells, RWQCB  
Michael Green, NASA HQ  
Mr. Joseph Terry, USFWS  
204-15\H. Hoffman  
T20G-4\J. Lukas  
T20G-4\C. Alderete  
T20G-4\A. Martin

# **ATTACHMENT 3**

## **Silt Fence Installation Photographs (December 17-19, 2013)**



**ICAM sample locations SDS01 through SDS03.  
View looking north along west side of 8-acre FSFA.**



**South end double wall silt fence. West side 8-acre FSFA.**

**Near SDS01. See previous picture for location.**



**ICAM sample location SDS03. Silt fence and trench.  
View looking northwest from west side of 8-acre FSFA.**



**ICAM sample locations SDS05 & SDS04 (in background).**

**View looking south along western side of 8-acre FSFA.**



**ICAM sample location SDS06. Note “mouse” bridge.**

**View looking east-northeast along northern end of 8-acre FSFA.**



**ICAM sample location SDS07.**

**View looking north at northern end of 8-acre FSFA.**



**ICAM sample location SDS08.**

**View looking east from northern portion of 8-acre FSFA.**



**ICAM sample locations SDS09 (background) and SDS10 (foreground).**

**View looking north along eastern side of 8-acre FSFA.**



**ICAM sample location SDS11 (note small rock on left in next picture).**

**View looking northwest along east central side of 8-acre FSFA.**



**View looking southwest toward ICAM sample location SDS12.**

**Note small rock in lower right corner adjacent to ICAM sample location SDS11.**



**ICAM sample location SDS12 (SDS13 & SDS14 in background).**

**View looking southwest along eastern side of 8-acre FSFA.**



**ICAM sample location SDS15 at silt fence end (SDS14 in background to left).**

**View looking northeast from southern portion of 8-acre FSFA, east side.**

# ATTACHMENT 4

## Baseline Sediment Samples Analytical Results

(Post Silt Fence Installation-December 20, 2013)

# CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

January 03, 2014

**CLS Work Order #: CWL1055**  
**COC #:**

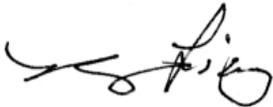
Luke Metz  
Earth Resource Technologies c/o NASA-Ames  
Bldg T20G-4, Room 135  
Moffet Field, CA 94053-1000

**Project Name: Former Soil Fill Area Sediment  
Samples**

Enclosed are the results of analyses for samples received by the laboratory on 12/23/13 17:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,



James Liang, Ph.D.  
Laboratory Director

CA DOHS ELAP Accreditation/Registration number 1233

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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OREMANA</td> <td colspan="4">12/23/13 11:45</td> </tr> <tr> <td colspan="4">RECEIVED AT LAB BY:</td> <td colspan="4">DATE/TIME:</td> <td colspan="4">CONDITIONS/COMMENTS:</td> <td colspan="4"></td> </tr> <tr> <td colspan="4">SHIPPED BY:</td> <td colspan="4"> <input type="checkbox"/> FED EX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER <u>CLS Courier</u> </td> <td colspan="4">AIR BILL #</td> <td colspan="4"></td> </tr> </table>				DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	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# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY				CLS ID. NO. <u>CWL1055</u> (2 of 2)										
<b>Report To:</b>			Client Job Number											
Name and Address ERT			03601-28											
NASA Ames Research Center			Destination Laboratory											
Moffett Field, CA			<input checked="" type="checkbox"/> <b>CLS</b> (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com  <input type="checkbox"/> <b>OTHER</b>											
Project Manager Luke Metz (650) 604-2753														
Project Name Former Soil Fill Area Sediment Samples														
Sampled By Luke Metz														
Job Description Peninsula Samples 5 Feet From Silt Fence														
Site Location			<b>PRESERVATIVES</b> PCB's (incl 1268) by 8082 PP-13 Metals DDT, DDD, DDE by 8081A											
ANALYSIS REQUESTED														
GEOTRACKER														
EDF REPORT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO														
GLOBAL ID.														
FIELD CONDITIONS:			TURNAROUND TIME IN DAYS											
COMPOSITE:			SPECIAL INSTRUCTIONS											
			1 2 5 10											
DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	NO.	TYPE								
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12/20/13	1200	FSFA-SDS13-2013		Soil	1	8oz Jar	3	X	X	X				
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12/20/13	1210	FSFA-SDS15-2013		Soil	1	8oz Jar	3	X	X	X				
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SUSPEC	SAMPL	PRESERVATIVES (1) HCL												
RELINQUISHED BY (Signature)				PRINT NAME/COMPANY				DATE/TIME						
Luke Metz <i>[Signature]</i>				Luke Metz - SAIC / ERT				12-23-13 / 11:45am <i>[Signature]</i> M. ORELIANA						
RECEIVED AT LAB BY: <i>[Signature]</i>				DATE/TIME: 12/23/13 1730				CONDITIONS / COMMENTS: 4						
SHIPPED BY:				<input type="checkbox"/> FED EX <input type="checkbox"/> UPS <input checked="" type="checkbox"/> OTHER <input type="checkbox"/> CLS										

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS01-2013 (CWL1055-01) Soil    Sampled: 12/20/13 11:00    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
<b>Beryllium</b>	<b>0.72</b>	0.25	"	"	"	"	"	"	
<b>Cadmium</b>	<b>0.70</b>	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>37</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>8.5</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>67</b>	1.0	"	"	"	"	"	"	
<b>Silver</b>	<b>0.75</b>	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>53</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>52</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	ND	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS02-2013 (CWL1055-02) Soil    Sampled: 12/20/13 11:05    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
<b>Beryllium</b>	<b>0.34</b>	0.25	"	"	"	"	"	"	
<b>Cadmium</b>	<b>0.56</b>	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>39</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>17</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>44</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>39</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>64</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.9</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS03-2013 (CWL1055-03) Soil    Sampled: 12/20/13 11:10    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
<b>Beryllium</b>	<b>0.39</b>	0.25	"	"	"	"	"	"	
<b>Cadmium</b>	<b>0.89</b>	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>47</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>24</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>61</b>	1.0	"	"	"	"	"	"	
<b>Silver</b>	<b>1.5</b>	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>36</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>110</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	ND	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS04-2013 (CWL1055-04) Soil    Sampled: 12/20/13 11:15    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>28</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>13</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>17</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>32</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>26</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.5</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS05-2013 (CWL1055-05) Soil    Sampled: 12/20/13 11:20    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	13	"	5	CW08505	12/26/13	12/30/13	EPA 6010B	
Beryllium	ND	1.3	"	"	"	"	"	"	
Cadmium	ND	2.5	"	"	"	"	"	"	QB-2
<b>Copper</b>	<b>17</b>	5.0	"	"	"	"	"	"	
<b>Lead</b>	<b>18</b>	13	"	"	"	"	"	"	
<b>Nickel</b>	<b>28</b>	5.0	"	"	"	"	"	"	
Silver	ND	2.5	"	"	"	"	"	"	
<b>Zinc</b>	<b>62</b>	5.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>21</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>2.9</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

<b>FSFA-SDS06-2013 (CWL1055-06) Soil    Sampled: 12/20/13 11:25    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>27</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>15</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>25</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>44</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>30</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.3</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS07-2013 (CWL1055-07) Soil    Sampled: 12/20/13 12:15    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>15</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>14</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>17</b>	1.0	"	"	"	"	"	"	
<b>Silver</b>	<b>0.88</b>	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>21</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>23</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	ND	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS08-2013 (CWL1055-08) Soil    Sampled: 12/20/13 11:30    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>20</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>15</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>18</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>25</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>42</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.0</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS09-2013 (CWL1055-09) Soil    Sampled: 12/20/13 11:35    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	13	"	5	CW08505	12/26/13	12/30/13	EPA 6010B	
Beryllium	ND	1.3	"	"	"	"	"	"	
Cadmium	ND	2.5	"	"	"	"	"	"	QB-2
<b>Copper</b>	<b>8.3</b>	5.0	"	"	"	"	"	"	
Lead	ND	13	"	"	"	"	"	"	
<b>Nickel</b>	<b>17</b>	5.0	"	"	"	"	"	"	
Silver	ND	2.5	"	"	"	"	"	"	
<b>Zinc</b>	<b>21</b>	5.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>7.9</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	ND	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS10-2013 (CWL1055-10) Soil    Sampled: 12/20/13 11:40    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
<b>Beryllium</b>	<b>0.47</b>	0.25	"	"	"	"	"	"	
<b>Cadmium</b>	<b>0.61</b>	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>32</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>11</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>51</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>55</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>54</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>2.6</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS11-2013 (CWL1055-11) Soil    Sampled: 12/20/13 11:45    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	13	"	5	CW08505	12/26/13	12/30/13	EPA 6010B	
Beryllium	ND	1.3	"	"	"	"	"	"	
Cadmium	ND	2.5	"	"	"	"	"	"	
<b>Copper</b>	<b>15</b>	5.0	"	"	"	"	"	"	
<b>Lead</b>	<b>20</b>	13	"	"	"	"	"	"	
<b>Nickel</b>	<b>36</b>	5.0	"	"	"	"	"	"	
Silver	ND	2.5	"	"	"	"	"	"	
<b>Zinc</b>	<b>39</b>	5.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>27</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	<b>3.0</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

<b>FSFA-SDS11K-2013 (CWL1055-12) Soil    Sampled: 12/20/13 11:50    Received: 12/23/13 17:30</b>									
<b>Mercury</b>	<b>0.11</b>	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/30/13	EPA 6010B	
<b>Beryllium</b>	<b>0.27</b>	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>26</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>17</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>41</b>	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>47</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>51</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	ND	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS12-2013 (CWL1055-13) Soil    Sampled: 12/20/13 11:55    Received: 12/23/13 17:30</b>									
Mercury	0.16	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	0.68	0.25	"	"	"	"	"	"	
Cadmium	0.54	0.50	"	"	"	"	"	"	
Copper	49	1.0	"	"	"	"	"	"	
Lead	32	2.5	"	"	"	"	"	"	
Nickel	76	1.0	"	"	"	"	"	"	
Silver	0.74	0.50	"	"	"	"	"	"	
Zinc	96	1.0	"	"	"	"	"	"	
Chromium	70	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	6.7	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS13-2013 (CWL1055-14) Soil    Sampled: 12/20/13 12:00    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	0.61	0.50	"	"	"	"	"	"	
Copper	27	1.0	"	"	"	"	"	"	
Lead	16	2.5	"	"	"	"	"	"	
Nickel	28	1.0	"	"	"	"	"	"	
Silver	ND	0.50	"	"	"	"	"	"	
Zinc	35	1.0	"	"	"	"	"	"	
Chromium	55	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
Arsenic	3.5	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS14-2013 (CWL1055-15) Soil    Sampled: 12/20/13 12:05    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
Antimony	ND	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
Cadmium	ND	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>23</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>17</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>21</b>	1.0	"	"	"	"	"	"	
<b>Silver</b>	<b>0.53</b>	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>36</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>29</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.8</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	
<b>FSFA-SDS15-2013 (CWL1055-16) Soil    Sampled: 12/20/13 12:10    Received: 12/23/13 17:30</b>									
Mercury	ND	0.10	mg/kg	1	CW08554	12/27/13	12/30/13	EPA 7471A	
<b>Antimony</b>	<b>2.9</b>	2.5	"	"	CW08505	12/26/13	12/26/13	EPA 6010B	
Beryllium	ND	0.25	"	"	"	"	"	"	
<b>Cadmium</b>	<b>0.88</b>	0.50	"	"	"	"	"	"	
<b>Copper</b>	<b>25</b>	1.0	"	"	"	"	"	"	
<b>Lead</b>	<b>27</b>	2.5	"	"	"	"	"	"	
<b>Nickel</b>	<b>25</b>	1.0	"	"	"	"	"	"	
<b>Silver</b>	<b>2.1</b>	0.50	"	"	"	"	"	"	
<b>Zinc</b>	<b>36</b>	1.0	"	"	"	"	"	"	
<b>Chromium</b>	<b>29</b>	2.5	"	10	CW08504	12/26/13	12/30/13	EPA 7000	
<b>Arsenic</b>	<b>3.0</b>	2.5	"	"	"	"	"	"	
Selenium	ND	2.5	"	"	"	"	"	"	
Thallium	ND	2.5	"	"	"	"	"	"	



# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**FSFA-SDS05-2013 (CWL1055-05) Soil**    **Sampled: 12/20/13 11:20**    **Received: 12/23/13 17:30**

4,4'-DDD	ND	75	µg/kg	10	CW08566	12/27/13	01/02/14	EPA 8081A	
4,4'-DDE	ND	75	"	"	"	"	"	"	
4,4'-DDT	ND	75	"	"	"	"	"	"	

<i>Surrogate: Tetrachloro-meta-xylene</i>		81 %		46-139	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		43 %		52-141	"	"	"	"	QS-4

**FSFA-SDS06-2013 (CWL1055-06) Soil**    **Sampled: 12/20/13 11:25**    **Received: 12/23/13 17:30**

4,4'-DDD	ND	75	µg/kg	10	CW08566	12/27/13	01/02/14	EPA 8081A	
4,4'-DDE	ND	75	"	"	"	"	"	"	
4,4'-DDT	ND	75	"	"	"	"	"	"	

<i>Surrogate: Tetrachloro-meta-xylene</i>		62 %		46-139	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		16 %		52-141	"	"	"	"	QS-4

**FSFA-SDS07-2013 (CWL1055-07) Soil**    **Sampled: 12/20/13 12:15**    **Received: 12/23/13 17:30**

4,4'-DDD	ND	75	µg/kg	10	CW08566	12/27/13	01/02/14	EPA 8081A	
4,4'-DDE	ND	75	"	"	"	"	"	"	
4,4'-DDT	ND	75	"	"	"	"	"	"	

<i>Surrogate: Tetrachloro-meta-xylene</i>		66 %		46-139	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		73 %		52-141	"	"	"	"	

**FSFA-SDS08-2013 (CWL1055-08) Soil**    **Sampled: 12/20/13 11:30**    **Received: 12/23/13 17:30**

4,4'-DDD	ND	75	µg/kg	10	CW08566	12/27/13	01/02/14	EPA 8081A	
4,4'-DDE	ND	75	"	"	"	"	"	"	
4,4'-DDT	ND	75	"	"	"	"	"	"	

<i>Surrogate: Tetrachloro-meta-xylene</i>		67 %		46-139	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		29 %		52-141	"	"	"	"	QS-4







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Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Polychlorinated Biphenyls by EPA Method 8082A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS03-2013 (CWL1055-03) Soil    Sampled: 12/20/13 11:10    Received: 12/23/13 17:30</b>									
Aroclor 1268	ND	20	µg/kg	1	CW08581	"	12/31/13	EPA 8082A	
<i>Surrogate: Decachlorobiphenyl</i>		51 %	50-150		"	"	"	"	
<b>FSFA-SDS04-2013 (CWL1055-04) Soil    Sampled: 12/20/13 11:15    Received: 12/23/13 17:30</b>									
Aroclor 1016	ND	20	µg/kg	1	CW08581	12/27/13	12/31/13	EPA 8082A	
Aroclor 1221	ND	20	"	"	"	"	"	"	
Aroclor 1232	ND	20	"	"	"	"	"	"	
Aroclor 1242	ND	20	"	"	"	"	"	"	
Aroclor 1248	ND	20	"	"	"	"	"	"	
Aroclor 1254	ND	20	"	"	"	"	"	"	
<b>Aroclor 1260</b>	<b>30</b>	20	"	"	"	"	"	"	
Aroclor 1268	ND	20	"	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		76 %	50-150		"	"	"	"	
<b>FSFA-SDS05-2013 (CWL1055-05) Soil    Sampled: 12/20/13 11:20    Received: 12/23/13 17:30</b>									
Aroclor 1016	ND	20	µg/kg	1	CW08581	12/27/13	12/31/13	EPA 8082A	
Aroclor 1221	ND	20	"	"	"	"	"	"	
Aroclor 1232	ND	20	"	"	"	"	"	"	
Aroclor 1242	ND	20	"	"	"	"	"	"	
Aroclor 1248	ND	20	"	"	"	"	"	"	
Aroclor 1254	ND	20	"	"	"	"	"	"	
<b>Aroclor 1260</b>	<b>22</b>	20	"	"	"	"	"	"	
Aroclor 1268	ND	20	"	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		112 %	50-150		"	"	"	"	



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Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Polychlorinated Biphenyls by EPA Method 8082A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS08-2013 (CWL1055-08) Soil</b> <b>Sampled: 12/20/13 11:30</b> <b>Received: 12/23/13 17:30</b>									
Aroclor 1268	ND	20	µg/kg	1	CW08581	"	12/31/13	EPA 8082A	
<i>Surrogate: Decachlorobiphenyl</i>		58 %	50-150		"	"	"	"	
<b>FSFA-SDS09-2013 (CWL1055-09) Soil</b> <b>Sampled: 12/20/13 11:35</b> <b>Received: 12/23/13 17:30</b>									
Aroclor 1016	ND	20	µg/kg	1	CW08581	12/27/13	12/31/13	EPA 8082A	
Aroclor 1221	ND	20	"	"	"	"	"	"	
Aroclor 1232	ND	20	"	"	"	"	"	"	
Aroclor 1242	ND	20	"	"	"	"	"	"	
Aroclor 1248	ND	20	"	"	"	"	"	"	
Aroclor 1254	ND	20	"	"	"	"	"	"	
Aroclor 1260	ND	20	"	"	"	"	"	"	
Aroclor 1268	ND	20	"	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		75 %	50-150		"	"	"	"	
<b>FSFA-SDS10-2013 (CWL1055-10) Soil</b> <b>Sampled: 12/20/13 11:40</b> <b>Received: 12/23/13 17:30</b>									
Aroclor 1016	ND	20	µg/kg	1	CW08581	12/27/13	12/31/13	EPA 8082A	
Aroclor 1221	ND	20	"	"	"	"	"	"	
Aroclor 1232	ND	20	"	"	"	"	"	"	
Aroclor 1242	ND	20	"	"	"	"	"	"	
Aroclor 1248	ND	20	"	"	"	"	"	"	
Aroclor 1254	ND	20	"	"	"	"	"	"	
<b>Aroclor 1260</b>	<b>24</b>	20	"	"	"	"	"	"	
Aroclor 1268	ND	20	"	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>		88 %	50-150		"	"	"	"	







# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08504 - EPA 3050B

**Blank (CW08504-BLK1)** Prepared: 12/26/13 Analyzed: 12/30/13

Chromium	ND	0.25	mg/kg				75-125		30	
Arsenic	ND	0.25	"							
Selenium	ND	0.25	"							
Thallium	ND	0.25	"							

**LCS (CW08504-BS1)** Prepared: 12/26/13 Analyzed: 12/30/13

Chromium	5.53	0.25	mg/kg	5.00		111	75-125		30	
Arsenic	5.10	0.25	"	5.00		102	75-125			
Selenium	4.71	0.25	"	5.00		94	75-125			
Thallium	5.20	0.25	"	5.00		104	75-125			

**Matrix Spike (CW08504-MS1)** Source: CWL1055-01 Prepared: 12/26/13 Analyzed: 12/30/13

Chromium	72.2	2.5	mg/kg	5.00	52.0	405	75-125		30	QM-7
Arsenic	7.81	2.5	"	5.00	2.25	111	75-125			
Selenium	4.77	2.5	"	5.00	ND	95	75-125			
Thallium	5.67	2.5	"	5.00	ND	113	75-125			

**Matrix Spike Dup (CW08504-MSD1)** Source: CWL1055-01 Prepared: 12/26/13 Analyzed: 12/30/13

Chromium	73.9	2.5	mg/kg	5.00	52.0	438	75-125	2	30	QM-7
Arsenic	7.86	2.5	"	5.00	2.25	112	75-125	0.6	30	
Selenium	4.53	2.5	"	5.00	ND	90	75-125	5	30	
Thallium	6.35	2.5	"	5.00	ND	127	75-125	11	30	QM-7

### Batch CW08505 - EPA 3050B

**Blank (CW08505-BLK1)** Prepared & Analyzed: 12/26/13

Antimony	ND	2.5	mg/kg							
Beryllium	ND	0.25	"							
Cadmium	ND	0.50	"							
Copper	ND	1.0	"							
Lead	ND	2.5	"							
Nickel	ND	1.0	"							
Silver	ND	0.50	"							

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08505 - EPA 3050B

#### Blank (CW08505-BLK1)

Prepared & Analyzed: 12/26/13

Zinc	ND	1.0	mg/kg							
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#### LCS (CW08505-BS1)

Prepared & Analyzed: 12/26/13

Antimony	23.8	2.5	mg/kg	25.0		95	75-125			
Beryllium	23.4	0.25	"	25.0		94	75-125			
Cadmium	22.2	0.50	"	25.0		89	75-125			
Copper	23.4	1.0	"	25.0		94	75-125			
Lead	22.7	2.5	"	25.0		91	75-125			
Nickel	23.3	1.0	"	25.0		93	75-125			
Silver	22.7	0.50	"	25.0		91	75-125			
Zinc	23.6	1.0	"	25.0		94	75-125			

#### Matrix Spike (CW08505-MS1)

Source: CWL1055-01

Prepared & Analyzed: 12/26/13

Antimony	4.12	2.5	mg/kg	25.0	ND	16	75-125			QM-5
Beryllium	13.1	0.25	"	25.0	0.725	50	75-125			QM-5
Cadmium	16.4	0.50	"	25.0	0.695	63	75-125			QM-5
Copper	66.6	1.0	"	25.0	36.6	120	75-125			
Lead	23.6	2.5	"	25.0	8.46	60	75-125			QM-5
Nickel	60.1	1.0	"	25.0	66.6	NR	75-125			QM-5
Silver	17.7	0.50	"	25.0	0.750	68	75-125			QM-5
Zinc	54.8	1.0	"	25.0	53.2	6	75-125			QM-5

#### Matrix Spike Dup (CW08505-MSD1)

Source: CWL1055-01

Prepared & Analyzed: 12/26/13

Antimony	19.8	2.5	mg/kg	25.0	ND	79	75-125	131	30	QM-5
Beryllium	17.4	0.25	"	25.0	0.725	67	75-125	28	30	QM-5
Cadmium	20.0	0.50	"	25.0	0.695	77	75-125	20	30	
Copper	64.0	1.0	"	25.0	36.6	109	75-125	4	30	
Lead	43.4	2.5	"	25.0	8.46	140	75-125	59	30	QM-5
Nickel	75.7	1.0	"	25.0	66.6	36	75-125	23	30	QM-5
Silver	20.6	0.50	"	25.0	0.750	79	75-125	15	30	
Zinc	66.2	1.0	"	25.0	53.2	52	75-125	19	30	QM-5

# CALIFORNIA LABORATORY SERVICES

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Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08554 - EPA 7471A

<b>Blank (CW08554-BLK1)</b>				Prepared: 12/27/13 Analyzed: 12/30/13						
Mercury	ND	0.10	mg/kg							
<b>LCS (CW08554-BS1)</b>				Prepared: 12/27/13 Analyzed: 12/30/13						
Mercury	0.247	0.10	mg/kg	0.250		99	75-125			
<b>Matrix Spike (CW08554-MS1)</b>				Source: CWL1039-26 Prepared: 12/27/13 Analyzed: 12/30/13						
Mercury	0.277	0.10	mg/kg	0.250	0.0383	96	75-125			
<b>Matrix Spike Dup (CW08554-MSD2)</b>				Source: CWL1039-26 Prepared: 12/27/13 Analyzed: 12/30/13						
Mercury	0.248	0.10	mg/kg	0.250	0.0383	84	75-125	11	25	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08566 - LUFT-DHS GCNV

#### Blank (CW08566-BLK1)

Prepared: 12/27/13 Analyzed: 01/02/14

4,4'-DDD	ND	15	µg/kg							
4,4'-DDE	ND	15	"							
4,4'-DDT	ND	15	"							
Surrogate: Tetrachloro-meta-xylene	7.11		"	8.33		85	46-139			
Surrogate: Decachlorobiphenyl	8.56		"	8.33		103	52-141			

#### LCS (CW08566-BS1)

Prepared: 12/27/13 Analyzed: 01/02/14

Aldrin	15.7	1.0	µg/kg	16.7		94	47-132			
gamma-BHC (Lindane)	15.4	10	"	16.7		93	56-133			
4,4'-DDT	16.6	15	"	16.7		100	46-137			
Dieldrin	16.6	1.0	"	16.7		99	44-143			
Endrin	13.6	15	"	16.7		81	30-147			
Heptachlor	16.6	5.0	"	16.7		99	33-148			
Surrogate: Tetrachloro-meta-xylene	7.96		"	8.33		96	46-139			
Surrogate: Decachlorobiphenyl	9.25		"	8.33		111	52-141			

#### LCS Dup (CW08566-BSD1)

Prepared: 12/27/13 Analyzed: 01/02/14

Aldrin	14.0	1.0	µg/kg	16.7		84	47-132	12	30	
gamma-BHC (Lindane)	13.6	10	"	16.7		82	56-133	13	30	
4,4'-DDT	13.3	15	"	16.7		80	46-137	22	30	
Dieldrin	14.5	1.0	"	16.7		87	44-143	13	30	
Endrin	11.1	15	"	16.7		67	30-147	20	30	
Heptachlor	14.1	5.0	"	16.7		85	33-148	16	30	
Surrogate: Tetrachloro-meta-xylene	7.62		"	8.33		91	46-139			
Surrogate: Decachlorobiphenyl	8.21		"	8.33		99	52-141			

#### Matrix Spike (CW08566-MS1)

Source: CWL1055-09

Prepared: 12/27/13 Analyzed: 01/02/14

Aldrin	9.15	10	µg/kg	16.7	ND	55	47-138			
gamma-BHC (Lindane)	15.2	100	"	16.7	ND	91	38-144			
4,4'-DDT	17.9	150	"	16.7	ND	107	41-157			
Dieldrin	11.9	10	"	16.7	ND	72	46-155			
Endrin	12.3	150	"	16.7	ND	74	34-149			

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08566 - LUFT-DHS GCNV

#### Matrix Spike (CW08566-MS1)

Source: CWL1055-09 Prepared: 12/27/13 Analyzed: 01/02/14

Heptachlor	21.6	50	µg/kg	16.7	ND	130	36-155			
Surrogate: Tetrachloro-meta-xylene	16.0		"	20.8		77	46-139			
Surrogate: Decachlorobiphenyl	9.18		"	20.8		44	52-141			QS-4

#### Matrix Spike Dup (CW08566-MSD1)

Source: CWL1055-09 Prepared: 12/27/13 Analyzed: 01/02/14

Aldrin	9.10	10	µg/kg	16.7	ND	55	47-138	0.6	35	
gamma-BHC (Lindane)	14.6	100	"	16.7	ND	88	38-144	4	35	
4,4'-DDT	16.1	150	"	16.7	ND	97	41-157	10	35	
Dieldrin	12.1	10	"	16.7	ND	72	46-155	0.9	35	
Endrin	12.1	150	"	16.7	ND	73	34-149	1	35	
Heptachlor	21.4	50	"	16.7	ND	129	36-155	0.7	35	
Surrogate: Tetrachloro-meta-xylene	15.9		"	20.8		76	46-139			
Surrogate: Decachlorobiphenyl	6.89		"	20.8		33	52-141			QS-4

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CWL1055 COC #:
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## Polychlorinated Biphenyls by EPA Method 8082A - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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### Batch CW08581 - LUFT-DHS GCNV

Blank (CW08581-BLK1)		Prepared: 12/27/13 Analyzed: 12/31/13								
Aroclor 1016	ND	20	µg/kg							
Aroclor 1221	ND	20	"							
Aroclor 1232	ND	20	"							
Aroclor 1242	ND	20	"							
Aroclor 1248	ND	20	"							
Aroclor 1254	ND	20	"							
Aroclor 1260	ND	20	"							
Aroclor 1268	ND	20	"							
Surrogate: Decachlorobiphenyl	6.45		"	8.33		77	50-150			
LCS (CW08581-BS1)		Prepared: 12/27/13 Analyzed: 12/31/13								
Aroclor 1260	71.4	20	µg/kg	83.3		86	29-131			
Surrogate: Decachlorobiphenyl	6.80		"	8.33		82	50-150			
LCS Dup (CW08581-BSD1)		Prepared: 12/27/13 Analyzed: 12/31/13								
Aroclor 1260	70.5	20	µg/kg	83.3		85	29-131	1	30	
Surrogate: Decachlorobiphenyl	13.4		"	16.7		80	50-150			
Matrix Spike (CW08581-MS1)		Source: CWL1055-15		Prepared: 12/27/13 Analyzed: 12/31/13						
Aroclor 1260	55.4	20	µg/kg	83.3	20.8	42	29-131			
Surrogate: Decachlorobiphenyl	7.62		"	8.33		91	50-150			
Matrix Spike Dup (CW08581-MSD1)		Source: CWL1055-15		Prepared: 12/27/13 Analyzed: 12/31/13						
Aroclor 1260	48.8	20	µg/kg	83.3	20.8	34	29-131	13	30	
Surrogate: Decachlorobiphenyl	6.53		"	8.33		78	50-150			

# CALIFORNIA LABORATORY SERVICES

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01/03/14 09:45

Earth Resource Technologies c/o NASA-Ames  
Bldg T20G-4, Room 135  
Moffet Field, CA 94053-1000

Project: Former Soil Fill Area Sediment Samples  
Project Number: 03601-28  
Project Manager: Luke Metz

**CLS Work Order #: CWL1055**  
COC #:

## Notes and Definitions

- QS-4 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- QM-7 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- QM-5 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
- QB-2 The analyte was detected in the method blank or calibration verification blank. A re-analysis was not performed since all sample results for the analyte are ND.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

# CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

January 09, 2014

**CLS Work Order #: CXA0028**

**COC #: GREEN**

Luke Metz

Earth Resource Technologies c/o NASA-Ames

Bldg T20G-4, Room 135

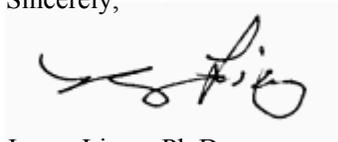
Moffet Field, CA 94053-1000

**Project Name: Former Soil Fill Area Sediment  
Samples**

Enclosed are the results of analyses for samples received by the laboratory on 01/02/14 14:46. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Liang', is centered below the word 'Sincerely,'. The signature is written in a cursive style with a large initial 'J'.

James Liang, Ph.D.  
Laboratory Director

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CXA0028 COC #: GREEN
---	---	---

**CHANGE OF STATUS** CXA0028

CLS Labs Job # CWC 1055

Project Name: Former Soil Fill Area Sediment Samples

Date Sample(s) Were Received: 12/23/13 Original Date 12/21/13

Luke Metz of ERT emailed  
called  
(Client Contacted) (Company)

on 1/2/14 at 1417  
(Date) (Time)

... and requested the following:

Please run Chrome 6 on:  
FSFA-SD03-2013 (#3)

phase run Chrome 6 & TCU AS on:  
FSFA-SDS12-2013 (#13)

Turnaround time requested for additional work: 5 day  
[Signature] 1/2/14  
(Signature) (Date)

Updated lab job database and file folder by: \_\_\_\_\_

Cc: \_\_\_\_\_

H:\WillOrellana\ChangeOfStatus.Doc

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CXA0028 COC #: GREEN
---	---	---

## CHANGE OF STATUS

CXA0028

CLS Labs Job # CWL 1055

Project Name: Former Soil Fill Area Sediment Samples

Date Sample(s) Were Received: 12/23/13 Original Date 12/21/13

Luke Metz (Client Contacted) of ERT (Company) <sup>emailed</sup> <sub>called</sub>

on 1/2/14 (Date) at 1417 (Time)

... and requested the following:

Please run Chrome 6 on:  
FSFA-SD03-2013 (#3)

please run Chrome 6 # ~~10/13~~ on: <sup>11/13/14</sup>  
FSFA-SDS/2-2013 (#13)

Turnaround time requested for additional work: 5 day  
SL (Signature) 1/2/14 (Date)

Updated lab job database and file folder by: \_\_\_\_\_  
Cc: \_\_\_\_\_

# CALIFORNIA LABORATORY SERVICES

Page 3 of 5

01/09/14 12:13

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CXA0028 COC #: GREEN
---	---	---

## Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>FSFA-SDS03-2013 (CXA0028-03) Soil Sampled: 12/20/13 11:10 Received: 01/02/14 14:46</b>									
Hexavalent Chromium	ND	10	µg/kg	1	CX00065	01/06/14	01/06/14	EPA 7199	
<b>FSFA-SDS12-2013 (CXA0028-13) Soil Sampled: 12/20/13 11:55 Received: 01/02/14 14:46</b>									
Hexavalent Chromium	ND	10	µg/kg	1	CX00065	01/06/14	01/06/14	EPA 7199	

CA DOHS ELAP Accreditation/Registration Number 1233

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CXA0028 COC #: GREEN
---	---	---

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch CX00065 - General Prep</b>										
<b>Blank (CX00065-BLK1)</b> Prepared & Analyzed: 01/06/14										
Hexavalent Chromium	ND	10	µg/kg							
<b>LCS (CX00065-BS1)</b> Prepared & Analyzed: 01/06/14										
Hexavalent Chromium	48.2	10	µg/kg	50.0		96	80-120			
<b>LCS Dup (CX00065-BSD1)</b> Prepared & Analyzed: 01/06/14										
Hexavalent Chromium	46.4	10	µg/kg	50.0		93	80-120	4	20	
<b>Matrix Spike (CX00065-MS1)</b> Source: CXA0028-03 Prepared & Analyzed: 01/06/14										
Hexavalent Chromium	41.7	10	µg/kg	50.0	ND	83	75-125			
<b>Matrix Spike Dup (CX00065-MSD1)</b> Source: CXA0028-03 Prepared & Analyzed: 01/06/14										
Hexavalent Chromium	43.2	10	µg/kg	50.0	ND	86	75-125	3	25	

# CALIFORNIA LABORATORY SERVICES

Earth Resource Technologies c/o NASA-Ames Bldg T20G-4, Room 135 Moffet Field, CA 94053-1000	Project: Former Soil Fill Area Sediment Samples Project Number: 03601-28 Project Manager: Luke Metz	CLS Work Order #: CXA0028 COC #: GREEN
---	---	---

## Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

# ATTACHMENT 5

## Response to EPA Comments

## NASA Ames Response to EPA Review Comments

*Draft Area Of Investigation 14 Interim Corrective Action Measures Completion Report, NASA Ames Research Center, Moffett Field, California, January 2014 (ERT, 2014)*

### **General Comments:**

#### EPA General Comment 1:

*The ICAM CR includes a summary of “baseline sediment samples;” however, these data are not compared to confirmation or backfill sampling conducted by the Navy upon completion of the Installation Restoration (IR) Site 25 Remedial Action. The Navy’s 2012 confirmation and backfill sampling results represent the actual baseline data for the area surrounding AOI 14, before any seasonal rainfall in 2013. The “baseline sampling” conducted by NASA upon completion of the ICAM occurred after rainfall in November and December 2013 that may have resulted in the release of contaminated soil from AOI 14 and is not necessarily representative of the site before implementation of Corrective Action Measures. Revise the report to present the Navy and NASA’s data and include a comparison and discussion of the data with regard to releases that may have occurred after completion of the Navy’s Site 25 action.*

#### NASA Response to General Comment 1:

The baseline sediment samples were collected immediately after installation of the silt fence in accordance with the AOI 14 Interim Corrective Action Measures (ICAM) Work Plan (Sections 6.3, 7.2 and 8.3). Fifteen samples were collected from the periphery of the fill area, within 5 feet of the outside perimeter of the fence. In comparison, only five Navy IR Site 25 confirmation samples were collected in this general area approximately 25 to 50 feet from the outside perimeter of the fence. The NASA baseline samples provide more representative information concerning potential contaminated soil releases from the fill peninsula than the Navy confirmation samples. To evaluate potential releases, the NASA baseline sample results were compared to the Navy IR Site 25 COC sediment remediation goals. Where detected, COC concentrations were below the sediment remediation goals in all of the baseline samples. The NASA baseline sediment sampling data do not indicate impacts to Navy IR Site 25 since remedial action was completed. No changes to the text are proposed.

#### EPA General Comment 2:

*Include Joseph Terry of US Fish and Wildlife Service (USFWS) in the distribution for documents related to the ICAM and any forthcoming Corrective Action Measure(s).*

#### NASA Response to General Comment 2:

NASA will add Joseph Terry of US Fish and Wildlife Service (USFWS) to the distribution list for documents related to the ICAM and any forthcoming Corrective Action Measure(s) reporting.

EPA General Comment 3:

*Per Paragraph 39 of the Order, the ICAM CR must be signed by NASA's project coordinator and include as-built drawings. The ICAM CR must also be signed and stamped by a California-registered professional engineer.*

NASA Response to General Comment 3:

The silt fencing was installed in accordance with the drawings contained in the ICAM Work Plan. The text at the end of Section 4.1 clarifies that there were no significant deviations from the Work Plan. The drawings from the Work Plan are included in Attachment 1 with a new drawing showing a plan view of the fence location, including approximate locations of the "mouse bridges." The report is signed by NASA's project coordinator and is signed and stamped by a California-registered professional engineer.

EPA General Comment 4:

*Include a schedule specifying submittal dates for the quarterly monitoring reports. Since completion of the ICAM on December 19, 2013, no monitoring reports have yet been submitted. Also, include dates for reporting of annual sediment samples.*

NASA Response to General Comment 4:

The submittal schedule for quarterly monitoring reports is provided in Section 9.0 of the ICAM Work Plan and specifies quarterly reports due January 31st, April 30th, July 31st and October 31st for the preceding quarters. Since the ICAM was completed December 19<sup>th</sup>, 2013, a quarterly monitoring report has not yet been generated. The first quarterly report for the period January 1, 2014 through March 31, 2014 will be submitted by April 30, 2014.

As specified in Section 6.3 of the ICAM Work Plan, annual sediment sampling will be conducted in September depending on water levels in the adjacent wetlands areas. The annual sediment sampling results will be included in the third quarterly monitoring report, due October 31.

The schedule for submittal of quarterly monitoring reports and annual sediment sampling results is provided at the end of Section 4.2.

## Specific Comments:

### EPA Specific Comment 1:

*Section 2.0: The last sentence of this section states that COCs are not present in the N217 and N217A fill areas surface soil. Clarify that COCs are present at depth and that silt fencing was not installed around these two fill areas because it was concluded that the contamination present in these areas did not present a risk to burrowing animals or to the environment through erosion of soil.*

### NASA Response to Specific Comment 1:

The Section 2.0 text states that “COCs are not present in the N217 and N217A fill areas surface soil above the Site 25 sediment remediation goals.” Language is added to the text to clarify the rationale presented in the ICAM Work Plan about the depth of detected COCs and need for silt fencing at the N217 and N217A areas.

### EPA Specific Comment 2:

*Section 3.0: Provide a figure that is a general site plan that shows the location of AOI 14 relative to NASA Ames, Navy IR Site 25, etc. While the current Figure 1 shows the location of AOI 14 relative to Navy IR Site 25, it does not show the reader where AOI 14 is in relation to surrounding site areas. Also, change Figure 1 to be Figure 2, etc.*

### NASA Response to Specific Comment 2:

New Figure 1 is added to the CR showing the location of AOI 14 in relation to surrounding areas, with subsequent figure numbers changed accordingly.

### EPA Specific Comment 3:

*Section 4.0: Revise the objective stated in the first sentence to include prevention of risks to the environment. Also, revise the ending of the last sentence to: “surrounding wetlands area that has been remediated by the Navy to levels safe for unrestricted use and exposure.”*

### NASA Response to Specific Comment 3:

The Section 4.0 text is revised to: “The objective of the ICAM is to prevent risks to the environment by controlling and monitoring potential soil erosion from the existing 8-acre FSFA fill peninsula into the surrounding wetlands area. Based on the presence of contaminated soil located within and near the boundaries of the 8-acre FSFA, NASA installed an erosion control barrier along the base of the 8-acre FSFA to prevent potential erosion of known COC-contaminated soil into the surrounding wetlands area that has been remediated by the Navy to levels safe for unrestricted use and exposure.”

EPA Specific Comment 4:

*Section 4.0: Include a discussion of mobilization and pre-silt-fence installation activities.*

NASA Response to Specific Comment 4:

The Section 4.0 text is revised to describe mobilization efforts and activities conducted to prepare for fence installation.

EPA Specific Comment 5:

*Section 4.1: Discuss any variations or deviations from the ICAM Work Plan.*

NASA Response to Specific Comment 5:

There were no significant variations or deviations to the approved ICAM Work Plan, and additional text is provided in Section 4.1 for clarification.

EPA Specific Comment 6:

*Section 4.1: State what the “post-installation site inspection” consisted of, when it was conducted, and who conducted it.*

NASA Response to Specific Comment 6:

NASA environmental management division contract personnel, NASA facilities staff and fence installation contractor staff inspected the silt fence on December 19, 2013. Inspection elements included depth of fence staking, burial depth of double-walled fence material, replacement of trenched soils at ground level along both sides of the fence surface, competency of fencing stakes, stapling of fence material to posts, correct spacing and installation of “mouse bridges” and replacement of disturbed pickleweed. Text is added to Section 4.1 to include this information.

EPA Specific Comment 7:

*Section 4.1: Include a description of measures taken to address USFWS concerns regarding the effect of the silt fence on the salt marsh harvest mouse (e.g., biological monitoring during installation, installation of access/egress points across the fence, etc.).*

NASA Response to Specific Comment 7:

As stipulated in the USFWS emergency consultation, comprehensive measures were implemented prior to and during silt fence installation to mitigate effects of the silt fence on the salt marsh harvest mouse. Text is added to Section 4.1 describing these measures.

EPA Specific Comment 8:

*Section 4.2: Include a discussion of rain events that occurred prior to completion of the silt fence installation. Describe the nature of the rain event and inspections conducted during and after those events.*

NASA Response to Specific Comment 8:

Prior to installation of the silt fence, several rain events occurred in the fall of 2013 resulting in the following monthly rainfall totals:

- September, 2013: 0.50 inches
- October, 2013: 0.01 inches
- November, 2013: 0.59 inches

Site visits were conducted on August 28, September 9, September 19, September 23 (immediately after the 0.50-inch rain event), October 28 (immediately after the 0.01-inch rain event) and November 22 (immediately after the 0.59-inch rain event). There was no visual evidence of surface sediment erosion or eroded soil that had entered the surrounding wetlands areas associated with these rain events. Since the fill peninsula is fully vegetated on both the surface and slopes, excessive rainfall sufficient to cause erosion of surface soils has not been observed even when rainfall has exceeded 1 inch in a 24-hour period as observed on February 28, 2014. Text is added to Section 4.2 to present this information.

EPA Specific Comment 9:

*Table of Contents (TOC) and Section 4.1: Revise the text to reflect that the USFWS emergency consultation documentation will be in Attachment 3. Currently it is not listed in the TOC and Section 4.1 states it is presented in Section 5.*

NASA Response to Specific Comment 9:

For clarification, Section 4.1 states that the USFWS emergency consultation was included in Attachment 5 of the ICAM Work Plan. The USFWS emergency consultation is also added to the ICAM CR as Attachment 2.

EPA Specific Comment 10:

*Section 4.2: Discuss results for all chromium samples; include chromium in Table 2.*

NASA Response to Specific Comment 10:

Text is added to Section 4.2 describing the chromium analyses and results for all samples. Chromium results are also also included in Table 2.

EPA Specific Comment 11:

*Table 2: Explain the values in the table that include a "<."*

NASA Response to Specific Comment 11:

A footnote to Table 2 is added indicating that "<" designates a value less than the stated reporting limit.

EPA Specific Comment 12:

*Section 5.0: Revise the last sentence of the section to: "Annual sediment samples will be collected and the results will be compared to baseline data and reported to the EPA as specified in the approved AOI 14 ICAM WP."*

NASA Response to Specific Comment 12:

Section 5.0 is modified to indicate that the annual sediment sampling results will be compared to Navy IR Site 25 sediment remediation goals as a measure of the ICAM performance. Trends in annual sample results compared to the baseline sample results will also be considered.

EPA Specific Comment 13:

*Attachment 1: Include the date the photographs were taken.*

NASA Response to Specific Comment 13:

Text has been added to the end of Section 4.1 and to the Attachment 4 cover sheet to indicate the photograph dates of December 17 through 19, 2013.

EPA Specific Comment 14:

*Attachment 1, page A-5: A “mouse bridge” is noted in the photo; however, there is no discussion in the ICAM CR of why the “mouse bridge” was installed. See Specific Comments 7 and 9 above.*

NASA Response to Specific Comment 14:

Information regarding the installation of the “mouse bridges” is added to Section 4.1.

EPA Specific Comment 15:

*Attachment 1, page A-10: State the significance of the small rock in the lower right corner adjacent to sample location SDS11.*

NASA Response to Specific Comment 15:

The small rock adjacent to sample location SDS11 in picture A-9 was noted as a directional reference point in picture A-10.