

---

**SUBAREA 3 FSP ADDENDUM**  
**SANTA SUSANA FIELD LABORATORY SITE**  
**AREA IV RADIOLOGICAL STUDY**

---

**TO:** Andrew Bain, EPA Region 9 RPM  
**FROM:** T. Stewart Williford, HGL Associate Manager  
**THROUGH:** L. Steven Vaughn, R.G., HGL Project Manager  
Rene R. Rodriguez, P.E., HGL Deputy Project Manager  
**CC:** Mary Aycock, EPA Region 9 RPM  
Gregg Dempsey, Technical Advisor  
**DATE:** September 13, 2011  
**SUBJECT:** FSP Addendum for Subarea 3  
**CONTRACT NO:** EP-S7-05-05  
**TASK ORDER NO:** 0038

## **INTRODUCTION**

HydroGeoLogic, Inc. (HGL) has been tasked by the U.S. Environmental Protection Agency (USEPA) to conduct a radiological characterization study of Area IV and the Northern Buffer Zone at the Santa Susana Field Laboratory (SSFL) site in Ventura County, California. This work is being executed under USEPA Region 3 Architect and Engineering Services Contract EP-S7-05-05, Task Order 0038. The technical lead on the project is USEPA Region 9.

This document supports the field implementation of the overall soil sampling program and is an addendum to the master Field Sampling Plan (FSP) for Soil Sampling (HGL, 2010). A description of the overall project goals; data quality objectives; sampling strategy; laboratory analytical suites; sample depth interval selection; data quality control; and data evaluation are described in the FSP.

## **PURPOSE**

This addendum documents the rationale used to determine the location and depth of soil samples to be collected during the first phase (Round 1) of soil sampling within Subarea 3. Sample locations are summarized in Table 1 (Attachment 1) and illustrated on the figure provided in Attachment 2. This addendum also documents the laboratory analyses that will be performed for each soil sample, derived from the default suite from Table 2.4 of the FSP for Soil Sampling (HGL, 2010) and adding site-specific analytes to that list by location as appropriate.

It should be noted that the specific sample locations presented herein were discussed during a technical review meeting held on August 17, 2011, with members of USEPA's SSFL Technical Stakeholder group consisting of representatives of US Department of Energy (DOE), the State of California Department of Toxic Substances Control (DTSC), The Boeing Company, USEPA, and the community. Recommendations and action items identified at the

technical review meeting, including those on the topic of “Likely Chemical Remediation” (LCR) zones have been incorporated into this FSP Addendum. In Subarea 3 there is one LCR zone. USEPA understands that most, if not all, surface soil and infrastructure (building structures, concrete slabs, above-ground pipelines and underground pipelines etc.) may be excavated and removed from areas identified as LCR zones. Therefore, USEPA placed a reduced number of surface/subsurface samples within the LCR zones to define potential contamination at depth and placed surface/subsurface samples around the zone's perimeter to better define the potential extent of contamination associated with such zones. In accordance with our role under the Administrative Order on Consent for Remedial Action (DTSC, 2010) agreement between DTSC and DOE for the SSFL site, USEPA will conduct verification soil sampling post excavation to evaluate the attainment of site soil cleanup levels at all such remediation zones.

All soil samples will be analyzed for the default suite analytes presented in Table 2.4 of the master soil sampling FSP (HGL, 2010).

Table 1 in Attachment 1 provides the location for each soil sample that will be collected in Subarea 3 during Round 1 of the soil sampling investigation as well as the technical justification and rationale for the selection of each sample location. Also summarized in this table is the suite of radiological analyses that will be performed on every sample, as well as other field-pertinent information including sample identification number, type, and general proximity to radiological facilities.

Figure 1 provides a map that shows the location and type (e.g. surface, subsurface, drainage) of each sample within Subarea 3 (Attachment 2). Table 2 below, provides a summary of sample numbers by sample type.

**Table 2**  
**Summary of Sample Numbers by Sample Type**

<b>Drainage</b>	<b>Surface</b>	<b>Subsurface</b>	<b>Total</b>
0	2	13	15

Attachment 3 provides key technical information that led to the selection of sample locations, sample interval selection, and the laboratory analysis that will be performed for each sample collected. The key information includes results of geophysical surveys, gamma surface radiation surveys and the findings summarized in the Technical Memorandum Subarea HSA-7, Subarea HSA-3, Subarea HSA-Northern Buffer Zone Historical Site Assessment (HGL, 2011). No results of past soil radiological investigations were found for Subarea 3, and therefore no past radiological soil sampling map has been included in Attachment 3.

## **SCHEDULE**

The Round 1 soil sampling within Subarea 3 will start mid-September 2011, and be completed by late November 2011. The USEPA will provide periodic updates to SSFL Stakeholders

regarding the status of the soil sampling program as well as the laboratory analysis and data interpretation.

**REFERENCES**

HydroGeoLogic, Inc., 2010. Field Sampling Plan for Soil Sampling, Area IV Radiological Study, Santa Susana Field Laboratory Ventura County, California. October 4, 2010.

HydroGeoLogic, Inc., 2011. Draft, Technical Memorandum, Subarea HSA-7, Subarea HSA-3, Subarea HSA-Northern Buffer Zone, Historical Site Assessment, Santa Susana Field Laboratory Area IV Radiological Study, Ventura County, California. August, 2011.

State of California, Environmental Protection Agency, Department of Toxic Substances Control, 2010. Administrative Order On Consent For Remedial Action, Santa Susana Field Laboratory, Simi Hills, Ventura County, California. December 6, 2010.

**LIST OF ATTACHMENTS**

- Attachment 1    Table 1
- Attachment 2    Figure 1
- Attachment 3    Support Figures

**ATTACHMENT 1**

Table 1      Summary of Soil Sample Locations in Subarea 3

**Table 1**  
**Summary of Soil Sample Locations in Subarea 3**

Location ID	Sample Type	Location Description	Technical Justification	Analytical Suite <sup>1</sup>
1	Surface	Northeast portion of Subarea 3.	Gamma scanning results show a potential gamma radiation anomaly - PGRAY 1T	Default
1	Subsurface	Northeast portion of Subarea 3.	Gamma scanning results show a potential gamma radiation anomaly - PGRAY 1T	Default
2	Surface	East of the SCE Substation in Subarea 3.	Gamma scanning results show a potential gamma radiation anomaly - PGRAY 2T	Default
2	Subsurface	East of the SCE Substation in Subarea 3.	Gamma scanning results show a potential gamma radiation anomaly - PGRAY 2T	Default
3	Subsurface	South side of the SCE Substation.	Potential contamination from open storage activities conducted at the Old Conservation Yard.	Default
4	Subsurface	West side of the SCE Substation	Potential contamination from open storage activities conducted at the Old Conservation Yard.	Default
5	Subsurface	South side of the SCE Substation.	Potential contamination from open storage activities conducted at the Old Conservation Yard.	Default
6	Subsurface	East side of the SCE Substation.	Potential contamination from open storage activities conducted at the Old Conservation Yard.	Default
7	Subsurface	South of the SCE Substation.	Geophysical Features, "Conductivity and Magnetometer Anomalies". Aerial Photo feature, "Debris Area".	Default
8	Subsurface	South of the SCE Substation.	Geophysical Features, "Conductivity and Magnetometer Anomalies".	Default
9	Subsurface	South of the SCE Substation.	Geophysical Features, "Magnetometer and GPR".	Default
10	Subsurface	South of the SCE Substation, west of Building 204.	Geophysical Features, "Conductivity Anomaly".	Default
11	Subsurface	South of the SCE Substation and west of Building 204.	Geophysical Features, "Conductivity Anomaly".	Default
12	Subsurface	Southern portion of Subarea 3.	Geophysical Features, "Conductivity Anomaly".	Default
13	Subsurface	North of F Street within Subarea 3.	Geophysical Features, "Conductivity and Magnetometer Anomalies".	Default

**Notes:**

<sup>1</sup> Default suite includes the radionuclide analysis shown in Table 2.4 of the Field Sampling Plan for Soil Sampling (HGL, 2010a). All samples will be tested for the default suite of analytes.

GPR - ground penetrating radar

PGRAY - potential gamma radiation anomaly

SCE - Southern California Edison

SSFL - Santa Susana Field Laboratory

**ATTACHMENT 2**

Figure 1 Subarea 3 Sample Locations

**Figure 1**  
**Subarea 3 Sample Locations**  
**Santa Susana Field Laboratory**

U.S. EPA Region 9



**Legend**

Buildings:

Demolished

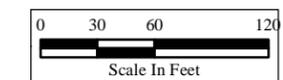
Existing

Subarea 3

Chemical Likely  
Remediation Zones

Subsurface Sample

Surface and Subsurface Sample



Y:\Santa\_Susana\EP9038\Soil\_Sampling\Subarea3\  
(1)Group1\ProposedSampleLocations\_11x17\_3.mxd  
8/30/2011 pbillock  
Source:HGL2010, CIRGIS 2007

**ATTACHMENT 3**

Gamma Anomalies Static Count Subarea 3  
Geophysical Anomalies Subarea 3  
Plate 1 Subarea HSA-3



**Legend**

- PGRAY Boundary
- SubArea3 Boundary
- Geophysical Anomalies
- HSA

**Buildings**

- DEMOLISHED
- EXISTING

**Centerline Roads**

- PRIMARY ROADS
- SECONDARY ROADS
- TERTIARY ROADS



**Gamma Anomalies  
Static Count  
Subarea 3  
Santa Susana Field Laboratory**

**U.S. EPA Region 9**



Path: I:\epa-09\GIS\maps\Annual EP909 GammaStaticSubArea3\_HSA\_Geophysical\_Count\_Count\_2010026.mxd  
Project: EP909S  
Editor: 05/18/11 PL  
Source: Boeing Company, 2008  
CIRGIS, 2007





**Legend**

Subarea 3 Groups

**Centerline Roads**  
 Primary Roads  
 Secondary Roads  
 Tertiary Roads

**Buildings**  
 Demolished  
 Existing

Magnetometer Anomaly Area

**Geophysical Anomalies**

- Terrain Conductivity
- Magnetometer
- Ground Penetrating Radar
- Cut and Fill Boundaries
- Magnetometer Anomaly Linear
- Terrain Conductivity Anomaly Linear
- Ground Penetrating Radar
- Interpreted Drain Remnant
- Buried Metals

**Surface Water**

- Intermittent Stream
- Permanent Stream
- Surface Water
- Lined Channel

**Surface Water Flow**

Surface Water Flow  
 (From Boeing Database, 2008)

**Surface Features**

- Channel
- Drain
- Drainage Divide
- Gutter
- Tank
- Tank
- Vault
- Well

**Utilities**

- Gas
- Storm Drain
- Sanitary Sewer
- Water
- Water (Removed)
- Water (Removed)
- Pipes (Unknown Type)
- Pipes (Unknown Type)

**Geophysical Anomalies  
 Subarea 3  
 Santa Susana Field Laboratory**

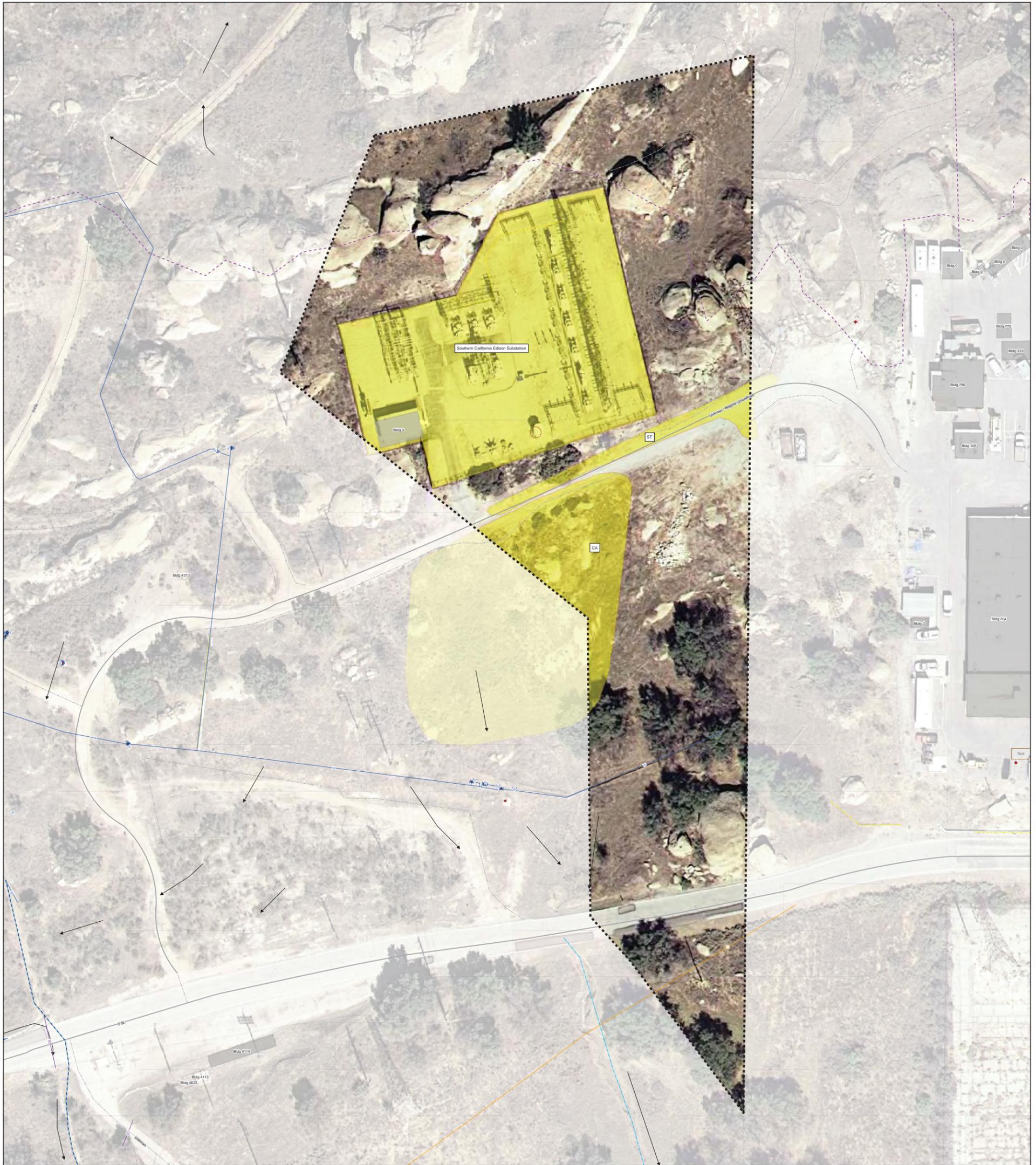
**U.S. EPA Region 9**



Y:\Santa\_Susana\EP9038\Geophysical\  
 Subarea\_3\_Geophysical\_20110722.mxd  
 8/16/2011 10:11:00 AM  
 Source: HGL, 2010, CIRGIS 2007  
 Coordinate System: NAD83 CA State Plane V



0 12.5 25 50  
 Scale In Feet



**Legend**

- HSA Sub-Area 3 Boundary
- Centerline Roads**
  - Primary Roads
  - Secondary Roads
  - Tertiary Roads
- Buildings**
  - Demolished
  - Existing
- Surface Water**
  - Intermittent Stream
- Aerial Photography Data**
  - Aerial Photography Features
- Surface Features**
  - Channel
  - Drain
  - Drain
  - Drainage Divide
  - Gutter
  - Tank
  - Tank
  - Vault
  - Well
- Utilities**
  - Gas
  - Storm Drain
  - Sanitary Sewer
  - Sanitary Waste
- Surface Water Flow**
  - Surface Water Flow (From Boeing Database, 2008)
- Aerial Photography Descriptors**

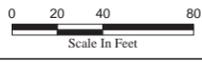
Type	Description
CA	Cleared Area
ST	Stain

Historical Site Assessment  
Draft Technical Memorandum - HSA-3

## Plate 1 Subarea HSA-3 Santa Susana Field Laboratory

**U.S. EPA Region 9**



Y:\Sant\_Susana\EP908\TM\HSA\_3  
 HSA-3\_Plate1.mxd  
 6/15/2011 10:04:44  
 Source: Boeing Company, 2008  
 CIRGIS, 2007

