REVISION 0

NORTH ST. LOUIS COUNTY SITES ANNUAL ENVIRONMENTAL MONITORING DATA AND ANALYSIS REPORT FOR CALENDAR YEAR 2012

ST. LOUIS, MISSOURI

JULY 19, 2013

U.S. Army Corps of Engineers
St. Louis District Office
Formerly Utilized Sites Remedial Action Program

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prepared by:
U.S. Army Corps of Engineers, St. Louis District Office,
Formerly Utilized Sites Remedial Action Program

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ACRONYMS AND ABBREVIATIONS

µCi/mL	microcurie(s) per milliliter
µg/L	microgram(s) per liter
µS/cm	microSiemen(s) per centimeter
Ac	actinium
AEC	Atomic Energy Commission
amsl	above mean sea level
ARAR	applicable or relevant and appropriate requirement
ATD	alpha track detector
BOD	biological oxygen demand
BTOC	below top of casing
°C	degrees Celsius (centigrade)
CEDE	committed effective dose equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
Ci	curie(s)
Cn	copernicum
COC	contaminant of concern
COD	chemical oxygen demand
CSR	*Code of State Regulations*
CY	calendar year
DCF	dose conversion factor
DHSS	Department of Health and Senior Services
DL	detection limit
DO	dissolved oxygen
DOD	U.S. Department of Defense
DOD QSM	*Department of Defense Quality Systems Manual*
DOE	U.S. Department of Energy
DQO	data quality objective
EDE	effective dose equivalent
EE/CA	engineering evaluation/cost analysis
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
EMDAR	Environmental Monitoring Data and Analysis Report
EMG	Environmental Monitoring Guide
EMICY	Environmental Monitoring Implementation for Calendar Year
EMICY12	*Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2012*
EMP	Environmental Monitoring Program
FFA	Federal Facility Agreement
ft	foot/feet
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
g	gram(s)
HISS	Hazelwood Interim Storage Site
HZ	hydrostratigraphic zone
IA	investigation area

ACRONYMS AND ABBREVIATIONS (Continued)

ICP	inductively coupled plasma
KPA	kinetic phosphorescence analysis
L	liter(s)
LCL_{95}	95 percent lower confidence limit
m	meter(s)
m^2	square meter(s)
MARSSIM	*Multi-Agency Radiation Survey and Site Investigation Manual*
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	method detection limit
MDNR	Missouri Department of Natural Resources
MED	Manhattan Engineer District
mg	milligram(s)
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MGD	million gallons per day
mSv/yr	millisievert(s) per year
mL	milliliter(s)
mL/L/hr	milliliter(s) per liter per hour
mL/min	milliliter(s) per minute
mrem	millirem
mrem/pCi	millirem per picocurie
mrem/qtr	millirem per quarter
mrem/yr	millirem per year
MSD	Metropolitan St. Louis Sewer District
mV	millivolt(s)
NAD	normalized absolute difference
NC	North St. Louis County
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NTU	nephelometric turbidity unit
ORP	oxidation reduction potential
Pa	protactinium
pCi/µg	picocurie(s) per microgram
pCi/g	picocurie(s) per gram
pCi/L	picocurie(s) per liter
PDI	pre-design investigation
QA	quality assurance
QAPP	Quality Assurance Program Plan
QC	quality control
RA	remedial action
Ra	radium
RCRA	Resource Conservation and Recovery Act
RG	remediation goal

ACRONYMS AND ABBREVIATIONS (Continued)

RME	reasonably maximally exposed
Rn	radon
ROD	*Record of Decision for the North St. Louis County Sites*
ROW	right of way
RPD	relative percent difference
S	test statistic
SAG	*Sampling and Analysis Guide for the St. Louis Sites*
SAIC	Science Application International Corporation
SLAPS	St. Louis Airport Site
SOP	standard operating procedure
SOR	sum of ratios
SS	settleable solid(s)
SU	survey unit
TEDE	total effective dose equivalent
Th	thorium
TLD	thermoluminescent dosimeter
TPH	total petroleum hydrocarbon
TSS	total suspended solid(s)
U	uranium
UCL	upper confidence limit
UCL_{95}	95 percent upper confidence limit
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VQ	validation qualifier
VP	vicinity property
WL	working level
WLM	working level month
WRS	Wilcoxon Rank Sum
yd^3	cubic yard(s)

EXECUTIVE SUMMARY

This Annual Environmental Monitoring Data and Analysis Report (EMDAR) for calendar year (CY) 2012 applies to the North St. Louis County (NC) Sites within the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the implementation of the Environmental Monitoring Program (EMP) for the NC Sites within the FUSRAP. Environmental monitoring of various media at the Latty Avenue Properties (Futura Coatings Company [Futura], the Hazelwood Interim Storage Site [HISS], and other Vicinity Properties [VPs]), the St. Louis Airport Site (SLAPS), and SLAPS VPs is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and a commitment outlined in the St. Louis FUSRAP Federal Facility Agreement (FFA).

The purpose of this report is:

1) to document the environmental monitoring activities, and
2) to assess whether the remedial actions (RAs) had a measurable environmental impact by:
    a) summarizing the data collection effort for CY 2012,
    b) reporting the current condition of the NC Sites, and
    c) providing an analysis of the environmental monitoring data to date.

The U.S. Army Corps of Engineers (USACE), St. Louis District, collects comprehensive environmental data for decision-making and planning purposes. Environmental monitoring, performed as a Best Management Practice or as a component of RAs, serves as a critical component in the evaluation of the current status of residual contaminants and assessment of the potential future migration of residual contaminants.

All environmental monitoring required through implementation of the *Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2012* (EMICY12) (USACE 2011) was conducted as planned during CY 2012. The evaluation of environmental monitoring data for all NC Sites demonstrates compliance with *Record of Decision for the North St. Louis County Sites* (ROD) (USACE 2005) goals and applicable or relevant and appropriate requirements (ARARs).

RADIOLOGICAL AIR MONITORING

Radiological air data was collected and evaluated at the NC Sites through airborne radioactive particulate, radon (indoor and outdoor), and gamma radiation monitoring as required in the EMICY12 (USACE 2011). In addition to environmental monitoring purposes, radiological air data was also used as inputs to calculate total effective dose equivalent (TEDE) to the reasonably maximally exposed (RME) member of the public for the NC Sites.

The TEDE calculated for the RME individual at the Latty Avenue Properties and the SLAPS and SLAPS VPs were all less than 0.1 millirem per year (mrem/yr) (0.001 millisievert per year [mSv/yr]). These calculated TEDEs are compliant with the 100 mrem/yr (1 mSv/yr) limit provided in 10 *Code of Federal Regulations (CFR)* 20.1301.

The radiological air monitoring results conducted at the NC Sites demonstrated compliance with all of the ARARs for the NC Sites as described in Tables 2-1 through 2-4 of the EMICY12 (USACE 2011).

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MONITORING

Discharge requirements for the NC Sites are currently set by the Missouri Department of Natural Resources (MDNR) National Pollutant Discharge Elimination System (NPDES) ARARs (permit-equivalent) document dated October 2, 1998 (MDNR 1998), and amended in a letter from the MDNR dated February 19, 2002 (MDNR 2002).

The storm-water sampling results for the NC Sites demonstrate compliance with the discharge limits described in Section 2.2.2 of the EMICY12 (USACE 2011).

EXCAVATION-WATER DISCHARGE MONITORING AT THE NORTH ST. LOUIS COUNTY SITES

CY 2012 was the eleventh year that excavation water was treated and discharged from the NC Sites. Excavation water from the NC Sites discharged to the sanitary sewer system is subject to the requirements stated in the July 23, 2001, Metropolitan St. Louis Sewer District (MSD) authorization letter (MSD 2001) and the selenium discharge variance letter for the SLAPS dated February 10, 2005 (MSD 2005). This authorization was extended for 2 years through the issuance of a letter dated May 24, 2012, from Mr. Steve Grace to Ms. Sharon Cotner. This authorization expires on July 23, 2014 (MSD 2012a). The selenium discharge variance for the SLAPS was not utilized in CY 2012 (MSD 2005 and 2012a).

HISS laboratory waste water is discharged in accordance with the MSD discharge authorization letter dated January 31, 2012 (MSD 2012b). The special discharge authorization was extended to February 7, 2014. The data collected at each site were compared to discharge limits described in Section 2.2.2 of the EMICY12 (USACE 2011). During CY 2012, no exceedances of the discharge limits occurred at the HISS laboratory or the NC Sites.

COLDWATER CREEK MONITORING

The CY 2012 Coldwater Creek surface-water and sediment sampling events completed in March and October of 2012 evaluated the physical, radiological, and chemical conditions in the creek. Samples were collected at each of the six surface-water and sediment sampling locations (C002 through C007). The data collected were compared to the monitoring guidelines and/or remediation goals (RGs) as described in Section 2.2.3 of the EMICY12 (USACE 2011).

The results of the surface-water and sediment sampling conducted in Coldwater Creek demonstrated compliance with ARARs for the NC Sites.

GROUND-WATER MONITORING

Ground water was sampled during CY 2012 at the NC Sites following a protocol for individual wells and analytes and was analyzed for various radiological constituents, and inorganic parameters. Static ground-water elevations for all NC Site wells were measured quarterly.

The environmental sampling requirements and ground-water monitoring guidelines for each analyte are consistent with the EMICY12 (USACE 2011) and were used for comparison and discussion purposes. The ROD ground-water monitoring guidelines (i.e., ROD guidelines) for assessing ground-water sampling data at the NC Sites (Latty Avenue Properties and the SLAPS and SLAPS VPs) are presented in Section 2.2.4 of the EMICY12 (USACE 2011) and in

Section 4.0 and Appendix F of this report. For those wells at which an analyte exceeded the ROD guidelines at least once during CY 2012 and sufficient data were available to evaluate trends, Mann-Kendall statistical trend analyses were completed to assess whether analyte concentrations were increasing or decreasing through time.

LATTY AVENUE PROPERTIES

Ground-water sampling was conducted at nine hydrostratigraphic zone (HZ)-A ground-water monitoring wells at the Latty Avenue Properties during CY 2012. The data indicate localized impacts to the HZ-A ground water from site-related constituents. Arsenic and molybdenum in HW22 were the inorganic contaminants of concern (COCs) detected at concentrations above the ROD guidelines for the shallow ground water (HZ-A). Three radiological COCs (uranium [U]-234, U-238, and total U) were detected in HISS-01 exceeding the ROD guidelines during CY 2012. One of the inorganic COCs, arsenic in HW22, and three radiological COCs (U-234, U-238, and total U) have been detected above the ROD guidelines for more than 12 months in HZ-A ground water in HISS-01. Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water. However, because arsenic, U-234, U-238, and total U levels have been above the ROD guidelines for a period of at least 12 months, monitoring will continue subject to subsequent 5-year reviews.

One Latty Avenue Properties monitoring well, HW23, is screened in HZ-C ground water. Because COC concentrations in HW23 have been low and relatively stable based on ground-water samples collected from the third quarter sampling event of CY 2000 through the third quarter sampling event of CY 2011, this well was not sampled during CY 2012.

The Mann-Kendall trend test was performed for three COCs in two HZ-A wells (total U in HISS-01 and arsenic and molybdenum in HW22) during CY 2012. The Mann-Kendall trend test resulted in a statistically significant increasing trend for arsenic and molybdenum in HW22. A statistically significant increasing trend was also identified for total U concentrations in HISS-01. However, total U concentrations in HISS-01 have declined from a high of 337 micrograms per liter (µg/L) on May 29, 2009, to 35.2 µg/L on August 21, 2012. The HZ-C well HW23 was not sampled during CY 2012. Therefore, trend analysis was not conducted for HZ-C ground water.

The potentiometric data indicate near-radial potentiometric surface contour patterns for the HZ-A ground water at the HISS and Futura. Wells HISS-01, HISS-06A, HISS-10, HISS-17S, and HW22 have the highest potentiometric surface elevations, with lower ground-water elevations measured in the surrounding wells. At the western edge of the site, ground water in the HZ-A zone flows to the west toward Coldwater Creek. The local gradient for HZ-A groundwater at the HISS and Futura ranged from 0.0103 foot (ft)/ft (May) to 0.0093 ft/ft (December) in CY 2012.

The potentiometric surface of the HZ-C ground water at the Latty Avenue Properties is not well defined due to the limited data available for the deeper HZs. Based on measured ground-water elevations in the HZ-C monitoring well HW23 at the Latty Avenue Properties and several HZ-C wells located to the southwest at the SLAPS and SLAPS VPs, the flow direction in the HZ-C ground water is generally toward the east or northeast. The local horizontal gradient for HZ-C ranged from 0.0036 ft/ft (December) to 0.0037 ft/ft (May) in CY 2012. This is a little higher than the gradient in CY 2011, which ranged from 0.0034 ft/ft (June) to 0.0036 ft/ft (November).

ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES

At the SLAPS and SLAPS VPs, 12 ground-water wells were sampled for various parameters during CY 2012. Ten wells, screened in HZ-A, were sampled at the SLAPS and the adjacent ballfields. Three inorganic analytes (chromium, molybdenum, and nickel) and one radiological contaminant (total U) were detected in HZ-A ground water at concentrations above the ROD guidelines. A comparison of the data indicates that the chromium concentrations in B53W09S, the nickel concentrations in B53W13S, and the total U concentrations in PW46 have been above the ROD guideline for a period of at least 12 months. Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2012. However, because chromium, nickel, and total U levels have been above the ROD guidelines for a period of at least 12 months, monitoring will continue subject to subsequent 5-year reviews.

During CY 2012, two wells screened across the deeper HZs (HZ-C through HZ-E) were sampled at the SLAPS and SLAPS VPs. Comparison of the data to the ROD guideline indicates that no COCs were detected at levels above the ROD guideline in HZ-C through HZ-E ground water. Therefore, the CY 2012 HZ-C through HZ-E ground-water data from the SLAPS and SLAPS VPs indicate that significant degradation of lower ground water is not occurring.

The Mann-Kendall trend test was performed for chromium (B53W06S, B53W09S, and B53W13S), molybdenum (B53W18S), nickel (B53W13S), and total U (PW46). Statistically significant increasing trends were observed for nickel in B53W13S and for chromium in B53W06S, B53W09S, and B53W13S. No trend was observed for molybdenum in B53W18S and total U in PW46. Trend analysis was not performed for molybdenum in B53W13S or U-238 in B53W19S, because they did not exceed their ROD guidelines if associated measurement errors were taken into account.

Potentiometric surface maps were created from ground-water elevations measured in May and December to illustrate ground-water flow conditions in wet and dry seasons, respectively. The potentiometric data indicated ground-water flow to the northwest toward Coldwater Creek in the HZ-A at the SLAPS. The flow direction in the HZ-C ground water at the SLAPS is generally east to northeast.

1.0 HISTORICAL SITE BACKGROUND AND CURRENT SITE STATUS

1.1 INTRODUCTION

This Annual Environmental Monitoring Data and Analysis Report (EMDAR) for calendar year (CY) 2012 applies to the North St. Louis County (NC) Sites (Figure 1-1) within the Formerly Utilized Sites Remedial Action Program (FUSRAP). This EMDAR provides an evaluation of the data collected as part of the implementation of the Environmental Monitoring Program (EMP) for the NC Sites within the FUSRAP. The NC Sites consists of the St. Louis Airport Site (SLAPS), its associated vicinity properties (VPs) (SLAPS VPs) (Figure 1-2), and the Latty Avenue Properties (Figure 1-3). The Latty Avenue Properties include Futura Coatings Company (Futura), the Hazelwood Interim Storage Site (HISS), and the Latty Avenue VPs. Additional environmental data were collected along Coldwater Creek, which flows adjacent to the SLAPS and near the HISS. Environmental monitoring of various media at each of the NC Sites is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and a commitment outlined in the Federal Facility Agreement (FFA).

1.2 PURPOSE

The purpose of this report is to document the environmental monitoring activities and to assess whether the remedial actions (RAs) being performed at the NC Sites could be having a measurable environmental impact. In addition, this report serves to enhance the reader's awareness of the current condition of the NC Sites, summarize the data collection efforts for CY 2012, and provide analysis of the CY 2012 environmental monitoring data results. This document presents the following information:

- Sample collection data for various media at each site and interpretation of CY 2012 EMP results;
- The compliance status of each site with federal and state applicable or relevant and appropriate requirements (ARARs) or other benchmarks (*Environmental Monitoring Implementation Plan for the North St. Louis County Sites for CY 2012* [EMICY12] [USACE 2011]);
- Dose assessments for radiological contaminants as appropriate at each site;
- A summary of trends based on changes in contaminant concentrations, to support RAs, ensure public safety, and maintain surveillance monitoring requirements at each site; and
- The identification of data gaps and future EMP needs.

1.3 ST. LOUIS SITE PROGRAM AND SITE BACKGROUND

The FUSRAP was executed by the U.S. Atomic Energy Commission (AEC) in 1974 to identify, remediate, or otherwise control sites at which residual radioactivity remains from operations conducted for the Manhattan Engineer District (MED) and AEC during the early years of the nation's atomic energy program. The FUSRAP was continued by the follow-on agencies to the AEC until 1997, when the U.S. Congress transferred responsibility for the FUSRAP to the U.S. Army Corps of Engineers (USACE).

On October 4, 1989, the SLAPS, the HISS, and Futura were placed on the *National Priorities List, St. Louis Airport/Hazelwood Interim Storage/FUTURA Coatings Co.* (NPL) (USEPA 1989a).

The three NPL sites have been involved with some of the following: refining of uranium ores, production of uranium metal and compounds, uranium recovery from residues and scrap, and the storage and disposal of associated process byproducts.

Detailed descriptions and histories for each site can be found in the *Remedial Investigation Report for the St. Louis Site* (DOE 1994), *Remedial Investigation Addendum for the St. Louis Site* (DOE 1995), *St. Louis Airport Site (SLAPS) Interim Action Engineering Evaluation/Cost Analysis (EE/CA)* (DOE 1997), *Engineering Evaluation/Cost Analysis (EE/CA) and Responsiveness Summary for the St. Louis Airport Site (SLAPS)* (USACE 1998a), *Environmental Evaluation/Cost Analysis (EE/CA) for the Hazelwood Interim Storage Site (HISS)* (USACE 1998b), the *Environmental Monitoring Guide for the St. Louis Sites* (EMG) (USACE 1999a), and the *Record of Decision for the North County Sites* (ROD) (USACE 2005).

During CY 2012, the following documents were finalized for the NC Sites:

- *CY2011 Fourth Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories* (January);
- *Pre-Design Investigation Work Plan for the St. Louis Airport Site Vicinity Property 16 and the Eva Loadout Facility* (February 2);
- *Addendum to the Pre-Design Investigation Summary Report for FUSRAP Latty Avenue Vicinity Property 02(L) – Building Interior and Exterior Data* (April 4);
- *Pre-Design Investigation Summary Report for the St. Louis Airport Site Vicinity Property 16 and the Eva Loadout Facility* (April 19);
- *CY2012 First Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories* (May)
- *Addendum to the Pre-Design Investigation Summary Report for Hazelwood Interim Storage Site and Futura – Building Interior and Exterior Data, St. Louis, Missouri.* (May 2);
- *Remedial Design/Remedial Action Work Description, Vicinity Properties Ballfields - Phase 2, Supplement No. 14 to the FUSRAP Remedial Action Work Plan for the North St. Louis County Sites* (May 10);
- *North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2011.* (July 13);
- *CY2012 Second Quarter Laboratory QA/QC Report for the FUSRAP St. Louis Radioanalytical Laboratory & Associated Satellite Laboratories, St. Louis, Missouri.* (August)
- *Pre-Design Investigation Work Plan Latty Avenue Right-of-Way Adjacent to Vicinity Property-01(L), FUSRAP North St. Louis County Sites* (August 31);
- *Futura Vicinity Property Building 2/3 Decontamination Plan, Addendum 2 of the Vicinity Properties Futura, HISS, and 40A East - Tract 3 Remedial Design/Remedial Action Work Description, Supplement No. 5 to the FUSRAP Remedial Action Work Plan for the North St. Louis County Sites* (September 6);
- *Remedial Design/Remedial Action Work Description, Vicinity Properties 16 and Norfolk Southern/Eva Load - Out Facility, Supplement No. 13 to the FUSRAP Remedial Action Work Plan for the North St. Louis County Sites* (August 9);

- *Post-Remedial Action Report and Final Status Survey for the Latty Avenue Vicinity Properties 03(L), 04(L), 05(L), and 06(L)* (September 27);
- *Pre-Design Investigation Work Plan Coldwater Creek: Northwest of Investigation Area-09 and Investigation Area - 10, St. Louis Airport Site Vicinity Properties, FUSRAP North St. Louis County Sites* (November 1);
- *Post-Remedial Action Report and Final Status Survey Evaluation for the Latty Avenue Vicinity Property 02(L)* (December 21); and
- *Environmental Monitoring Implementation Plan for the North St. Louis County Sites for Calendar Year 2013* (December 27).

1.3.1 Latty Avenue Properties CY 2012 Remedial Actions

During CY 2012, RAs were performed at the following Latty Avenue Properties (Figure 1-3): the HISS, Futura, and inside the Futura buildings. Restoration activities were completed in the first quarter at the HISS and Futura. Remedial activities inside the Futura buildings started in the second quarter and continued in the third and fourth quarters. The contaminated materials remediated as a result of the RA at the Latty Avenue Properties during CY 2012 totaled 747 cubic yards (yd^3). All of the contaminated materials were shipped via railcar to US Ecology of Idaho for proper disposal.

During CY 2012, *Multi-Agency Radiation Survey and Site Investigation (MARSSIM)* (DOD 2000) Class 1 verifications were performed at the HISS, inside the Futura buildings (Areas 1-8) and VP-01(L) buildings, and at VP-02(L). Verifications at the Latty Avenue Properties were performed to confirm the ROD remediation goals (RGs) were achieved. MARSSIM Class 2 and 3 verifications were performed inside the Futura buildings.

During CY 2012, characterizations/Pre-Design Investigations (PDIs) were performed at the main VP-01(L) building and the VP-03(L) building.

1.3.2 St. Louis Airport Site and St. Louis Airport Site Vicinity Properties CY 2012 Remedial Actions

During CY 2012, RAs were performed at the following SLAPS-related investigation areas (IAs) and VPs (Figure 1-2): IA-09 (Ballfields) Phase 1, Ballfields Phase 2, Frost Avenue Right-of-Way (ROW), and VP-16/Norfolk Southern/Eva Loadout Facility (hereafter referred to as Eva Loadout). At the Ballfields, Phase 1 excavation continued in the first and second quarters and was completed in the third quarter; while restoration activities began in the first quarter, continued in the second and third quarters, and were completed during the fourth quarter. Excavation and restoration activities began and were completed in the first quarter at the Frost Avenue ROW. Excavation activities began at the Ballfields Phase 2 in the second quarter and continued through the rest of the year. Restoration activities at the Ballfields Phase 2 and excavation activities at Eva Loadout began in the third quarter and continued in the fourth quarter. Restoration activities began at Eva Loadout in the fourth quarter. Approximately 11,689 yd^3 of contaminated materials were removed from the SLAPS IAs and VPs and were shipped via railcar to US Ecology of Idaho.

During CY 2012, MARSSIM Class 1 verifications were performed at the Ballfields (survey unit [SU]-1 through SU-9), the Frost Avenue ROW (SU-1), and Eva Loadout (SU-1 and SU-2) to confirm that ROD RGs were achieved. No MARSSIM Class 2 and 3 verifications were performed.

During CY 2012, characterizations/PDIs were performed at the following SLAPS VPs: Coldwater Creek Reach A and the ROWs of VPs 60, 61, and 62.

During CY 2012, there were no shipments of Resource Conservation and Recovery Act (RCRA) hazardous waste. No monitoring wells were decommissioned in CY 2012.

In accordance with the Metropolitan St. Louis Sewer District (MSD) authorization letter, 1,116,005 gallons of excavation water were discharged from the NC Sites in CY 2012. Since the beginning of the project, 24,900,798 gallons have been treated and released to MSD from the NC Sites.

2.0 EVALUATION OF RADIOLOGICAL AIR MONITORING DATA

This section documents environmental monitoring activities related to radiological air data. The radiological air measurements conducted at the NC Sites are part of the EMP. Radiological air data is collected to evaluate the compliance status of each site with ARARs, to evaluate trends, and to perform dose assessments for radiological contaminants as appropriate at each site. Section 2.1 includes a description of the types of radiological measurements conducted at the NC Sites, potential sources of the contaminants to be measured (including natural background), and measurement techniques employed during CY 2012.

All radiological air monitoring required through implementation of the EMICY12 (USACE 2011) was conducted as planned during CY 2012. The evaluations of radiological air monitoring data for all NC Sites demonstrated compliance with ARARs.

A total effective dose equivalent (TEDE) for the reasonably maximally exposed (RME) member of the public was calculated for the Latty Avenue Properties, the SLAPS, and the SLAPS VPs by summing the dose due to gamma radiation, radiological air particulates, and radon. The TEDE calculated for the reasonably maximally exposed individual at the Latty Avenue Properties, the SLAPS, and the SLAPS VPs were all less than 0.1 millirem per year (mrem/yr) (0.001 millisievert per year [mSv/yr]). These calculated TEDEs are compliant with the 100 mrem/yr (1 mSv/yr) limit provided in 10 *Code of Federal Regulations (CFR)* 20.1301. Details of the radiological dose assessment (TEDE calculation) are presented in Section 6.0.

2.1 RADIOLOGICAL AIR MEASUREMENTS

The three types of radiological air monitoring that were conducted at the NC Sites during CY 2012 are gamma radiation, airborne radioactive particulates, and airborne radon. Sections 2.2 and 2.3 provide details of the air monitoring conducted at the Latty Avenue Properties and the SLAPS and SLAPS VPs, respectively.

2.1.1 Gamma Radiation

Gamma radiation is emitted from natural, cosmic, and manmade sources. The earth naturally contains gamma radiation-emitting substances, such as the uranium decay series, the thorium decay series, and potassium-40. Cosmic radiation originates in outer space and filters through the atmosphere to the earth. Together, these two sources make up the majority of natural gamma background radiation. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) estimates that the total naturally occurring background radiation dose equivalent due to gamma exposure is 65 mrem/yr (0.65 mSv/yr), 35 mrem/yr (0.35 mSv/yr) of which originates from sources on earth and 30 mrem/yr (0.3 mSv/yr) of which originates from cosmic sources (UNSCEAR 1982). The background monitoring locations for the NC Sites (Figure 2-1) are reasonably representative of background gamma radiation for the St. Louis Metropolitan Area.

Gamma radiation was measured at the NC Sites during CY 2012 using thermoluminescent dosimeters (TLDs). TLDs were located at site boundaries in order to provide input for calculation of TEDE.

The TLDs were placed at the monitoring location approximately 3 feet (ft) above the ground surface inside a housing shelter. The TLDs were collected quarterly and sent to a properly certified, off-site laboratory for analysis.

2.1.2 Airborne Radioactive Particulates

2.1.2.1 Air Sampling

Airborne radioactive particulates result from radionuclides in soil that become suspended in the air. The radionuclides in soil normally become airborne as a result of wind erosion of the surface soil or as a result of the soil being disturbed (e.g., excavation). This airborne radioactive material includes naturally occurring background concentrations, as well as above background concentrations of radioactive materials present at the NC Sites.

Airborne radioactive particulates were measured at the NC Sites by drawing air through a filter membrane with an air sampling pump placed approximately 3 ft above the ground and then analyzing the material contained on the filter. The results of the analysis, when compared to the amount of air drawn through the filter, were reported as radioactive contaminant concentrations (i.e., microcurie per milliliter [µCi/mL]). Particulate air monitors were located at excavation and loadout area perimeter locations, as appropriate to provide input for the National Emissions Standards for Hazardous Air Pollutants (NESHAP) Report and calculation of TEDE to the critical receptor. Air particulate samples were typically collected weekly or at more frequent intervals.

2.1.2.2 Estimation of Emissions in Accordance with the National Emission Standard for Hazardous Air Pollutants

The NC Sites CY 2012 NESHAP Report (provided as Appendix A) presents the calculation of the effective dose equivalent (EDE) from radionuclide emissions to critical receptors in accordance with the NESHAP. The report is prepared in accordance with the requirements and procedures contained in 40 *CFR* 61, Subpart I.

Emission rates calculated using air sampling data, activity fractions, and other site-specific information were used for the NC Sites as inputs to the U.S. Environmental Protection Agency (USEPA) CAP88-PC Version 3.0 modeling code (USEPA 2007) to demonstrate compliance with the 10 mrem/yr ARAR in 40 *CFR* 61, Subpart I.

2.1.3 Airborne Radon

Uranium (U)-238 is a naturally occurring radionuclide that is commonly found in soil and rock. Radon (Rn)-222 is a naturally occurring radioactive gas found in the uranium decay series. A fraction of the radon produced from the radioactive decay of naturally occurring U-238 diffuses from soil and rock into the atmosphere, accounting for natural background airborne radon concentrations. In addition to this natural source, radon is produced from the above background concentrations of radioactive materials present at the NC Sites.

Outdoor airborne radon concentration is governed by the emission rate and dilution factors, both of which are strongly affected by meteorological conditions. Surface soil is the largest source of radon. Secondary contributors include oceans, natural gas, geothermal fluids, volcanic gases, ventilation from caves and mines, and coal combustion. Radon levels in the atmosphere have been observed to vary with height above the ground, season, time of day, and location. The chief meteorological parameter governing airborne radon concentration is atmospheric stability; however, the largest variations in atmospheric radon occur spatially (USEPA 1987).

Radon alpha track detectors (ATDs) were used at the NC Sites to measure alpha particles emitted from radon and its associated decay products. Radon ATDs were co-located with environmental

TLDs 3 ft above the ground surface in housing shelters at the site boundaries or at locations representative of areas accessible to the public. Outdoor ATDs were collected approximately every 6 months and sent to an off-site laboratory for analysis. Recorded radon concentrations are listed in picocurie per liter (pCi/L), and are used to provide input for calculation of TEDE.

In the NC Sites, ATDs were also placed in locations within applicable structures to monitor for indoor radon exposure. The ATDs were located in areas that represent the highest likely exposure from indoor radon. ATD locations were chosen with consideration given to known radium (Ra)-226 concentrations under applicable buildings and occupancy time at any one location within each building. Annual average indoor radon data in each applicable building were compared to the 40 *CFR* 192.12(b) ARAR value of 0.02 working levels (WL). In accordance with 40 *CFR* 192.12(b), reasonable effort shall be made to achieve in each habitable or occupied building an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration shall not exceed 0.03 WL. Background indoor radon monitors were not necessary, because the regulatory standard of 0.02 WL includes background. Indoor ATDs were also collected approximately every 6 months and sent to an off-site laboratory for analysis.

The NC Sites were in compliance with the 0.02 WL ARAR in 40 *CFR* 192.12(b). Results from CY 2012 demonstrating compliance are discussed in Section 2.2.4.

2.2 LATTY AVENUE PROPERTIES

For CY 2012, radiological air monitoring was only conducted at Futura.

2.2.1 Evaluation of Gamma Radiation Data

Because cleanup activities at the HISS and Futura (the remaining Latty Avenue Properties with the highest levels of residual contamination) were completed in CY 2011, external gamma radiation exposure from Latty Avenue Properties is considered negligible. Therefore, environmental TLD monitoring was not conducted at Latty Avenue Properties in CY 2012.

2.2.2 Evaluation of Airborne Radioactive Particulate Data

No excavation or loadout activities for the Latty Avenue Properties occurred in CY 2012. Therefore, radioactive particulate emissions were considered negligible, and air sampling for particulate radionuclides was not required.

2.2.3 Evaluation of Outdoor Airborne Radon Data

Because cleanup activities at the HISS and Futura were completed in CY 2011, outdoor exposure from Rn-222 from Latty Avenue Properties was considered negligible in CY 2012. Therefore, outdoor environmental Rn-222 monitoring was not conducted at Latty Avenue Properties.

2.2.4 Evaluation of Indoor Airborne Radon Data

Indoor radon monitoring was performed at Futura buildings using ATDs placed at several locations in each Futura building at a height of 4 ft (to approximate breathing zone conditions) to measure radon concentrations. The detectors were located as shown on Figure 2-2. The ATDs were installed in January of CY 2012 at each monitoring location, collected for analysis after approximately 6 months of exposure, and replaced with another set that would represent radon exposure for the rest of the year. Recorded radon concentrations (listed in pCi/L) were converted to radon WLs and an indoor radon equilibrium factor of 0.4 (NCRP 1988) was applied.

The results (including background) were evaluated based on the criteria contained in 40 *CFR* 192.12(b). The average annual radon concentration was determined to be less than the 40 *CFR* 192.12(b) criterion of 0.02 WL in each building (SAIC 2013a). Additional details of the data and calculation methodology used to determine indoor radon WLs in the Futura buildings are located in Table 2-1. Indoor ATD data is located in Appendix B of this report.

Table 2-1. Summary of Futura Indoor Airborne Radon (Rn-222) Data for CY 2012

Monitoring Location	Monitoring Station	Average Annual Concentration				
		01/10/12 to 07/05/12 [a] (pCi/L)	07/05/12 to 01/07/13[a] (pCi/L)	Annual Average (pCi/L)[b]	Building Average (pCi/L)[c]	WL[d]
Futura Building #1	HF-1	1.9	1.9	1.90	**2.17**	**0.009**
	HF-2	3.9	4.2	4.05		
	HF-3	0.7	0.4	0.55		
Futura Building #2/3	HF-4	0.6	0.6[e]	0.60	**0.88**	**0.004**
	HF-5	0.9	1.0	0.95		
	HF-6	0.7	0.7	0.70		
	HF-7	1.2	1.3	1.25		
Futura Building #4	HF-8	0.5	0.4	0.45	**0.53**	**0.002**
	HF-9	0.5	0.5[e]	0.50		
	HF-10	0.7	0.6	0.65		

[a] Detectors were installed and removed on the dates listed. Data are as reported from the vendor.
[b] Results reported from the vendor for two periods are averaged to estimate an annual average radon concentration (pCi/L) above background.
[c] In each building, the average annual result for each monitoring station within the building was used to calculate a building average.
[d] The average annual WL is calculated by dividing the average pCi/L by 100 pCi/L per WL and multiplying by 0.4. The average annual WL must be less than 0.02 (40 CFR 192.12(b)).
[e] The second semi-annual ATDs at station HF-4 and HF-9 were lost and could not be collected. First semi-annual results were assumed for second semi-annual monitoring period for both locations.

2.3 SLAPS AND SLAPS VICINITY PROPERTIES

For CY 2012, radiological air monitoring was conducted at the Ballfields, Eva Loadout, and the SLAPS.

2.3.1 Evaluation of Gamma Radiation Data

External gamma radiation exposure from the SLAPS VPs is considered negligible; therefore, environmental TLD monitoring was not conducted. Gamma radiation monitoring was performed at the SLAPS during CY 2012 at four site locations surrounding the loadout area (Figure 2-3) and at the background location to compare on-site/off-site exposure and to provide input for calculation of TEDE to the critical receptor (Section 6.0). The EMP uses two TLDs at Monitoring Station PA-2 (for each monitoring period) to provide additional quality control (QC) of the monitoring data.

A summary of TLD monitoring results for CY 2012 at the SLAPS is shown in Table 2-2. TLD data is located in Appendix B of this report.

Table 2-2. Summary of SLAPS Gamma Radiation Data for CY 2012

Monitoring Location	Monitoring Station	First Quarter TLD Data (mrem/qtr) Rpt./Cor.		Second Quarter TLD Data (mrem/qtr) Rpt./Cor.		Third Quarter TLD Data (mrem/qtr) Rpt./Cor.		Fourth Quarter TLD Data (mrem/qtr) Rpt./Cor.		CY 2012 Net TLD Data (mrem/yr)
		Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	Rpt.	Cor.[a,b]	
SLAPS Perimeter	PA-1	17.5	0.0	27.2	0.0	29.7	1.6	20.9	1.5	3
	PA-2	21.3	2.6	28.2	0.8	27.3	0.0	21.8	2.4	6
	PA-2[c]	17.8	0.0	27.8	0.4	29.8	1.7	22.2	2.9	---
	PA-3	17.1	0.0	26.3	0.0	29.1	0.9	20.3	0.9	2
	PA-4	18.1	0.0	28.6	1.2	30.2	2.2	20.9	1.5	5
Background	BA-1	19.3	---	27.4	---	28.3	---	19.4	---	23.6

[a] All quarterly data reported from the vendor have been normalized to exactly one quarter's exposure.
[b] CY 2012 net TLD data are corrected for background, shelter absorption (s/a = 1.075), and fade.
[c] A QC duplicate is collected at the same time and location and is analyzed by the same method for evaluating precision in sampling and analysis. Duplicate sample results were not included in calculations.
--- Result calculations not required.
Cor. – Corrected
mrem/qtr – millirem per quarter
Rpt. – Reported

2.3.2 Evaluation of Airborne Radioactive Particulate Data

For the SLAPS and SLAPS VPs, air sampling for particulate radionuclides was conducted at the perimeter of each active excavation and loadout area throughout the year. Air particulate data was used as inputs to the NESHAP Report (Appendix A) and calculation of TEDE to the critical receptor (Section 6.0).

A summary of air particulate monitoring data for the SLAPS and SLAPS VPs is shown in Table 2-3. Airborne radioactive particulate data is located in Appendix B of this report.

Table 2-3. Summary of SLAPS Airborne Radioactive Particulate Data for CY 2012

Monitoring Station	Average Concentration (µCi/mL)[a]	
	Gross Alpha	Gross Beta
Ballfields	3.55E-15	2.84E-14
Eva Loadout	5.43E-15	3.10E-14
SLAPS Loadout	3.77E-15	2.77E-14
Background Concentration[b]	4.24E-15	2.05E-14

[a] Average concentration values for the sampling period by location.
[b] These concentrations are only provided for informational purposes.

2.3.3 Evaluation of Outdoor Airborne Radon Data

Exposure from Rn-222 from the SLAPS VPs is considered negligible; therefore, outdoor environmental Rn-222 monitoring was not conducted. Outdoor airborne radon monitoring was performed at the SLAPS using ATDs placed around the loadout area to measure radon emissions from the site. Four detectors were co-located with TLDs, as identified on Figure 2-3. One additional detector was located at Monitoring Station PA-2 as a QC duplicate. A background ATD was used to compare on-site exposure and off-site background exposure. Outdoor airborne radon data was used as an input for calculation of TEDE to the critical receptor (Section 6).

A summary of CY 2012 outdoor radon data at the SLAPS is shown in Table 2-4. Outdoor ATD data is located in Appendix B of this report.

Table 2-4. Summary of SLAPS Outdoor Airborne Radon (Rn-222) Data for CY 2012

Monitoring Location	Monitoring Station	Average Annual Concentration (pCi/L)		
		01/04/12 to 07/06/12 [a] (Uncorrected)	07/06/12 to 01/10/13[a] (Uncorrected)	Average Annual Concentration[b]
SLAPS Perimeter	PA-1	0.3	0.2	0.00
	PA-2	0.8	0.2	0.05
	PA-2[c]	0.8	0.2	---
	PA-3	0.3	0.2	0.00
	PA-4	0.5	0.5	0.05
Background	BA-1	0.7	0.2	---

[a] Detectors were installed and removed on the dates listed. Data are as reported from the vendor (gross data including background).
[b] Results reported from vendor for two periods are time-weighted and averaged to estimate an annual average radon concentration (pCi/L) above background.
[c] A QC duplicate is collected at the same time and location, and is analyzed by the same method for evaluating precision in sampling and analysis.
--- Result calculation not required.

3.0 EVALUATION OF EXCAVATION-WATER, STORM-WATER, SURFACE-WATER, AND SEDIMENT MONITORING DATA

This section provides a description of the excavation-water, storm-water, surface-water, and sediment monitoring activities conducted at the NC Sites, including the monitoring of Coldwater Creek during CY 2012. The results obtained from these monitoring activities are presented and evaluated with respect to historical data and the appropriate discharge limits as described in the EMICY12 (USACE 2011).

Section 2.2.2 of the EMICY12 for the NC Sites outlines the discharge limits for the storm-water and excavation-water discharged at each site (USACE 2011). The MSD has issued discharge authorization letters for the NC Sites that established discharge-limit-based criteria (MSD 1998, 2001, 2006, 2008, 2010, and 2012a). The pollutants addressed for all NC Sites are identified in Table 2-5 of the EMICY12 (USACE 2011). The pollutants addressed in the National Pollutant Discharge Elimination System (NPDES) permit equivalent for the SLAPS will be applied at all NC Sites and are identified in Table 2-6 of the EMICY12 (USACE 2011). For cases in which the regulatory authorities have not provided radiological contaminant of concern (COC) discharge limits, the 10 *CFR* 20, Appendix B water effluent values are used to calculate the sum of ratios (SOR) value for each discharge. Additionally, the SOR aids in the establishment of water management protocols. The Missouri Department of Natural Resources (MDNR) has also issued an ARAR document outlining limits for the storm-water outfalls at the SLAPS (MDNR 1998).

3.1 EXCAVATION-WATER AND STORM-WATER DISCHARGE MONITORING

This section provides a description of the excavation-water and storm-water monitoring activities conducted at the NC Sites during CY 2012. The monitoring results obtained from these activities are presented and compared with the various authorization letters or permit-equivalent limits as presented in the EMICY12 (USACE 2011). The purpose of storm-water and excavation-water discharge sampling at the NC Sites is to maintain compliance with the specific discharge requirements for each respective site.

3.1.1 Metropolitan St. Louis Sewer District Special Discharge Approval for the Hazelwood Interim Storage Site On-Site Radioanalytical Laboratory

The USACE owns the HISS on-site laboratory located at 8945 Latty Avenue in Hazelwood, Missouri. The laboratory operates in accordance with an MSD special discharge approval. The laboratory waste-water is discharged to the MSD sewer system at Manhole 10K2-075S, which is shown on Figure 3-1. The MSD special discharge approval requires compliance with applicable discharge regulations (Ordinance 8472) (MSD 1991). The current special discharge approval extension was renewed on January 31, 2012, and expires February 7, 2014 (MSD 2012b).

3.1.2 Evaluation of Storm-Water Discharge Monitoring Results

During CY 2012, storm-water sampling at the SLAPS was conducted to verify compliance with NPDES permit-equivalent requirements. There is one NPDES outfall located at the SLAPS. This outfall has been assigned the station identification PN02 for Outfall 002. PN02 is located at the termination of a drainage feature that conveys storm water along the north side of McDonnell Boulevard to Coldwater Creek (Figure 3-2).

In conjunction with the construction of a sedimentation basin during CY 1998, the MDNR issued discharge sampling requirements for three outfalls (PN01 [now terminated], PN02, and PN03 [now terminated]). The ARAR permit-equivalent document requires monthly monitoring for flow, oil and grease, total petroleum hydrocarbons (TPHs), pH, settleable solids (SS), and polychlorinated biphenyls, as well as total recoverable arsenic, chromium, and cadmium. In addition, effluent monitoring for gross alpha, gross beta, protactinium (Pa)-231, actinium (Ac)-227, total Ra, total thorium (Th), and total U is required for each discharge event. Effluent monitoring for radon is required twice per year. As outlined in a letter from the USACE to the MDNR dated November 18, 2003, chemical oxygen demand monitoring (COD) has been modified from quarterly to annually (USACE 2003). Effluent monitoring for COD and radon was not performed in CY2012, because pumping in the active excavation areas was sporadic and only occurred within the first quarter of the year.

On February 19, 2002, the MDNR issued a letter to the USACE conditionally agreeing with a request to reduce the sampling frequency at PN02 to once per year, effective February of 2002 until the drainage area becomes affected by soil disturbance such as excavation (MDNR 2002). The condition of the agreement is that the MDNR be notified prior to the soil in the area being disturbed.

During 2012, un-named moving pumping outfalls were utilized during excavation activities at the Ballfields and Eva Loadout for the management of storm water with regard to sediment control and pumped excavation water. The moving outfalls were necessary to pump excess excavation water, which could not be contained due to geographic conditions, to Coldwater Creek. The un-named excess excavation water was pumped to Coldwater Creek in accordance with agreements made during a March 12, 2007, meeting with Mr. Tom Siegel of the MDNR, and as described in a subsequent letter from the USACE dated April 20, 2007 (USACE 2007). The excavation water sampling is conducted to verify compliance with the NPDES permit-equivalent requirements. The discharge parameters for the un-named outfalls follow the same NPDES parameters as Outfall PN02.

Analytical results for the NC Sites are presented in Appendix C, Table C-1. Quarterly summaries of the CY 2012 storm-water monitoring events for the NC Sites are presented in the following subsections. Quarterly NC Sites storm-water monitoring results for CY 2012 are presented in Tables 3-1 through 3-4.

During CY 2012, rainfall data was obtained from the National Weather Service Station at Lambert – St. Louis International Airport, which is adjacent to the NC Sites. Daily flow and rainfall data are included in Appendix C, Table C-2.

First Quarter

During the first quarter (January, February, and March) of CY 2012, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-1). Samples were collected when flow permitted. Two sampling events were conducted at Un-Named Outfall Ballfields during the first quarter.

Second Quarter

During the second quarter (April, May, and June) of CY 2012, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-2). Samples were collected when flow permitted. Two sampling events were conducted at Un-Named Outfall Ballfields during the second quarter.

Third Quarter

During the third quarter (July, August, and September) of CY 2012, no outfalls were sampled.

Fourth Quarter

During the fourth quarter (October, November, and December) of CY 2012, all NPDES sample results were in compliance with permit-equivalent requirements (Table 3-3). Samples were collected when flow permitted. One sampling event was conducted at Un-Named Outfall Eva Loadout during the fourth quarter. Outfall PN02 was scheduled for annual sampling during the fourth quarter; however, a rain event did not occur.

Table 3-1. First Quarter CY 2012 NPDES Sampling Events[a,b]

MONITORING PARAMETER	FINAL EFFLUENT LIMITATIONS			ANALYTICAL RESULTS		
				Un-Named Outfall Ballfields Results		
	Daily Maximum	Monthly Average	Units	Chemical Parameters		
				January	February	March
Flow	Monitor only	Monitor only	MGD	0.016	[c]	[c]
Oil and Grease	15	10	mg/L	non-detect	[c]	[c]
TPHs	10	10	mg/L	non-detect	[c]	[c]
pH-Units	6.0-9.0	NA	SU	7.49	[c]	[c]
COD[d]	120	90	mg/L	[d]	[c]	[c]
SS[e]	1.5	1	mL/L/hr	<0.1 [f]	[c]	[c]
Arsenic, Total Recoverable	100	100	µg/L	<15	[c]	[c]
Lead, Total Recoverable[g]	190	190	µg/L	[g]	[c]	[c]
Chromium, Total Recoverable	280	280	µg/L	7	[c]	[c]
Copper, Total Recoverable[g]	84	84	µg/L	[g]	[c]	[c]
Cadmium, Total Recoverable	94	94	µg/L	<2	[c]	[c]
Polychlorinated Biphenyls[h]	No release	No release	µg/L	non-detect	[c]	[c]
EVENT SAMPLING DATE				Radiological Parameters[i,j]		
				Event 1	Event 2	
				01/26/12	01/31/12	
Uranium, Total U[k,l]	Monitor only	Monitor only	µg/L	8.E-01	1.E+00	
Radium, Total[k,l]	Monitor only	Monitor only	µg/L	6.E-07	4.E-07	
Thorium, Total[k,l]	Monitor only	Monitor only	µg/L	2.E+00	6.E-01	
Gross Alpha[k]	Monitor only	Monitor only	pCi/L	0.E+00	3.E-01	
Gross Beta[k]	Monitor only	Monitor only	pCi/L	9.E+00	2.E+00	
Pa-231[k]	Monitor only	Monitor only	pCi/L	0.E+00	0.E+00	
Ac-227[k]	Monitor only	Monitor only	pCi/L	4.E+00	1.E+00	
Radon[m]	Monitor only	Monitor only	pCi/L	NS[m]	NS[m]	

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period which may also exceed the duration of 24 hours, and two events experienced within 48 hours may be reported together.
[b] PN02 (Outfall 002) sampled annually and not displayed.
[c] No sample is required because it doesn't meet the definition of an event.
[d] As per a USACE letter dated 11/18/03, COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[e] Detection Limit (DL) = 0.1 mL/L/hr
[f] The SS values ranged from 0 to 0.1 ml/L/hr with the weighted average of <0.2 ml/L/hr.
[g] Lead and copper sampling no longer necessary per the ROD.
[h] DL = 0.5 µg/L
[i] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[j] It is assumed that Ra-228 and Th-228 are in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[k] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit specified.
[l] Total nuclide values (in µg/L units) were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[m] Semi-annual reporting requirement only.

NS – not sampled
µg/L – micrograms per liter
MGD – million gallons per day
mg/L – milligrams per liter
mL/L/hr – milliliter per liter per hour

Table 3-2. Second Quarter CY 2012 NPDES Sampling Events[a,b]

MONITORING PARAMETER	FINAL EFFLUENT LIMITATIONS			ANALYTICAL RESULTS		
	Daily Maximum	Monthly Average	Units	Un-Named Outfall Ballfields Results		
				Chemical Parameters		
				April	May	June
Flow	Monitor only	Monitor only	MGD	c	d	d
Oil and Grease	15	10	mg/L	c	d	d
TPHs	10	10	mg/L	c	d	d
pH-Units	6.0-9.0	NA	SU	c	d	d
COD[e]	120	90	mg/L	c	d	d
SS[f]	1.5	1	mL/L/hr	c	d	d
Arsenic, Total Recoverable	100	100	μg/L	c	d	d
Lead, Total Recoverable[g]	190	190	μg/L	c	d	d
Chromium, Total Recoverable	280	280	μg/L	c	d	d
Copper, Total Recoverable[g]	84	84	μg/L	c	d	d
Cadmium, Total Recoverable	94	94	μg/L	c	d	d
Polychlorinated Biphenyls[h]	No release	No release	μg/L	c	d	d
EVENT SAMPLING DATE				Radiological Parameters[i,j]		
				Event 1	Event 2	
				04/16/12	04/29/12	
Uranium, Total[k,l]	Monitor only	Monitor only	μg/L	1.E+00	3.E-01	
Radium, Total[k,l]	Monitor only	Monitor only	μg/L	2.E-07	3.E-06	
Thorium, Total[k,l]	Monitor only	Monitor only	μg/L	7.E+00	1.E+01	
Gross Alpha[k]	Monitor only	Monitor only	pCi/L	0.E+00	2.E+00	
Gross Beta[k]	Monitor only	Monitor only	pCi/L	9.E+00	1.E+01	
Pa-231[k]	Monitor only	Monitor only	pCi/L	0.E+00	0.E+00	
Ac-227[k]	Monitor only	Monitor only	pCi/L	0.E+00	0.E+00	
Radon[m]	Monitor only	Monitor only	pCi/L	NS[m]	NS[m]	

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period which may also exceed the duration of 24 hours, and two events experienced within 48 hours may be reported together.
[b] PN02 (Outfall 002) sampled annually and not displayed.
[c] Un-named outfall only requires monthly chemical sampling if pumping is conducted during that month.
[d] No sample is required because it doesn't meet the definition of an event.
[e] As per a USACE letter dated 11/18/03, COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[f] DL = 0.1 mL/L/hr
[g] Lead and copper sampling no longer necessary per the ROD.
[h] DL = 0.5 μg/L
[i] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[j] It is assumed that Ra-228 and Th-228 are in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[k] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit specified.
[l] Total nuclide values in μg/L units were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[m] Semi-annual reporting requirement only.
NS – not sampled

Table 3-3. Fourth Quarter CY 2012 NPDES Sampling Events[a,b]

MONITORING PARAMETER	FINAL EFFLUENT LIMITATIONS			ANALYTICAL RESULTS		
	Daily Maximum	Monthly Average	Units	Un-Named Outfall Eva Loadout Results		
				Chemical Parameters		
				October	November	December
Flow	Monitor only	Monitor only	MGD	[c]	[c]	[d]
Oil and Grease	15	10	mg/L	[c]	[c]	[d]
TPHs	10	10	mg/L	[c]	[c]	[d]
pH-Units	6.0-9.0	NA	SU	[c]	[c]	[d]
COD[e]	120	90	mg/L	[c]	[c]	[d]
SS[f]	1.5	1	mL/L/hr	[c]	[c]	[d]
Arsenic, Total Recoverable	100	100	µg/L	[c]	[c]	[d]
Lead, Total Recoverable[g]	190	190	µg/L	[c]	[c]	[d]
Chromium, Total Recoverable	280	280	µg/L	[c]	[c]	[d]
Copper, Total Recoverable[g]	84	84	µg/L	[c]	[c]	[d]
Cadmium, Total Recoverable	94	94	µg/L	[c]	[c]	[d]
Polychlorinated Biphenyls[h]	No release	No release	µg/L	[c]	[c]	[d]
EVENT SAMPLING DATE				Radiological Parameters[i,j]		
				Event 1		
				12/20/12		
Uranium, Total[k,l]	Monitor only	Monitor only	µg/L	2.E+00		
Radium, Total[k,l]	Monitor only	Monitor only	µg/L	3.E-07		
Thorium, Total[k,l]	Monitor only	Monitor only	µg/L	2.E+00		
Gross Alpha[k]	Monitor only	Monitor only	pCi/L	3.E+00		
Gross Beta[k]	Monitor only	Monitor only	pCi/L	2.E+01		
Pa-231[k]	Monitor only	Monitor only	pCi/L	9.E+00		
Ac-227[k]	Monitor only	Monitor only	pCi/L	0.E+00		
Radon[m]	Monitor only	Monitor only	pCi/L	NS[m]		

[a] A rainfall event is defined as a measurable increase in discharge rate from precipitation producing 0.1 inch or more of liquid in a 24-hour period which may also exceed the duration of 24 hours, and two events experienced within 48 hours may be reported together.
[b] The annual sampling at PN02 (Outfall 002) was scheduled for the fourth quarter of 2012. A rain event did not occur.
[c] No sample is required because it doesn't meet the definition of an event.
[d] Un-named outfall only requires monthly chemical sampling if pumping is conducted during that month.
[e] As per a USACE letter dated 11/18/03, COD sampling requirement has been reduced from quarterly to annual sampling (USACE 2003).
[f] DL = 0.1 mL/L/hr
[g] Lead and copper sampling no longer necessary per the ROD.
[h] DL = 0.5 µg/L
[i] Value reported is based on a volume-weighted average of analyte activity concentrations for samples collected during the defined event. Corresponding radiological samples were collected on the same date as chemical samples; however, the radiological results are incorporated into the volume-weighted average for the specified event.
[j] It is assumed that Ra-228 and Th-228 are in secular equilibrium with Th-232; therefore, Th-232 results are used to estimate Ra-228 and Th-228 values.
[k] As specified in the permit-equivalent, radionuclides require monitoring only, and limits are not permit specified.
[l] Total nuclide values (in µg/L units) were calculated using the activity concentration values reported by the laboratory and values for specific activity listed in Table 8.4.1 of *The Health Physics and Radiological Health Handbook* (Shleien 1992).
[m] Semi-annual reporting requirement only.
NS – not sampled

3.1.3 Evaluation of Excavation-Water Monitoring Results at the North St. Louis County Sites

On July 23, 2001, the MSD conditionally approved the discharge of treated excavation-water to an MSD sanitary sewer inlet located at the SLAPS (MSD 2001). The current extension to the special discharge approval expires on July 23, 2014 (MSD 2012a). The primary condition of the approval requires a treatment system be installed, maintained, and operated to produce an effluent meeting the following standards: MSD ordinances 8472, 10177, and 10082 (MSD 1991, 1994, 1997); the Nuclear Regulatory Commission (NRC) requirements in 10 *CFR* 20, Appendix B; and the Missouri Department of Health and Senior Services (DHSS) requirements in 19 *Code of State Regulations (CSR)* 20-10. In addition, the MSD limits the annual allocation for radioactivity from the NC Sites to the MSD Coldwater Creek treatment plant. The MSD establishes the maximum volume of excavation-water allowed to be discharged in a 24-hour period and requires that the analytical results of the treated excavation-water comply with applicable standards and limits prior to discharge. The evaluation of monitoring data results demonstrate that all ARARs have been met. The selenium discharge variance for the SLAPS was not utilized in CY 2012 (MSD 2005, 2008, 2010, 2012a). There is no longer a requirement to analyze for barium, lead, and selenium after the first two batches from new investigative areas (MSD 2012a). Analytical results of the treated water are presented in Appendix C, Table C-3.

During CY 2012, approximately 1,116,005 gallons of treated excavation-water from eight treatment batches were released to discharge point 10L3-043S (Table 3-4). The discharge location is illustrated on Figure 3-2. Batches of treated excavation-water were sampled and analyzed for MSD effluent criteria (Appendix C, Table C-3).

Table 3-4. Excavation Water Discharged at the NC Sites During CY 2012

Quarter	Number of Discharges	Number of Gallons Discharged[a]	Total Activity (Curies [Ci])		
			Thorium[b]	Uranium (KPA)[c]	Radium[d]
1	3	266,240	5.21E-06	2.79E-05	1.21E-06
2	3	591,498	6.18E-06	2.41E-05	3.54E-06
3	0	0	0.00E+00	0.00E+00	0.00E+00
4	2	258,267	5.81E-06	1.25E-05	1.24E-06
Total	8	1,116,005	1.72E-05	6.46E-05	5.98E-06

[a] Quantities based on actual quarterly discharges from NC Sites.
[b] Calculated value based on the addition of isotopic analyses: Th-228 and Th-230.
[c] Value based on total U results (kinetic phosphorescence analysis [KPA]).
[d] Calculated value based on the addition of isotopic analyses: Ra-226 and Ra-228.

3.2 COLDWATER CREEK MONITORING

RA monitoring of surface water and sediment in Coldwater Creek is required until the creek has been remediated. The purpose of the monitoring is to document that RAs are having a positive effect on the creek and to provide additional data to assess whether Coldwater Creek is being measurably affected by COC migration from hydrostratigraphic zone (HZ)-A.

The EMP for Coldwater Creek evaluates the water quality and the radiological and chemical parameters present in the surface water and sediment. Surface water and sediment are monitored for the radiological and chemical parameters in List 2 of Table 3-3 of the EMICY12 (USACE 2011). The water quality parameters are measured only for surface water.

The water quality parameters measured include pH, temperature, dissolved oxygen (DO), specific conductivity, oxidation reduction potential (ORP), and turbidity. The objectives of the EMP are:

- to assess the quality of surface water and sediment in Coldwater Creek;
- to compare the results with monitoring guidelines and/or ROD RGs as established for these media in the EMICY12 (USACE 2011); and,

- to evaluate/determine whether runoff from the SLAPS, the HISS, the SLAPS VPs, and the Latty Avenue Properties affect the quality of surface water and sediment in Coldwater Creek.

The MDNR has designated Coldwater Creek as a metropolitan no-discharge stream. Therefore, discharges are prohibited, except as specifically permitted under the water quality standard, 10 *CSR* 20-7.031 and non-contaminated storm-water flows (10 *CSR* 20-7.015.1.A.4). Coldwater Creek, from its mouth at the Missouri River to its crossing with U.S. Highway 67 (Lindbergh Boulevard) (a distance of roughly 5.5 miles), is a Class C stream. Class C streams may cease flow during dry periods but maintain permanent pools that support aquatic life (10 *CSR* 20-7.031.1.F.6). The upper reach of Coldwater Creek south of U.S. Highway 67, which includes the SLAPS/HISS reach, is an unclassified water of the state.

Surface-water and sediment samples are collected from Coldwater Creek on a semi-annual basis as part of the EMP (USACE 2011). The sampling events are conducted at six Coldwater Creek monitoring stations (C002 through C007). Locations of the six monitoring stations are shown on Figure 3-3. Monitoring station C004, located between the SLAPS and the HISS, is used to monitor the potential water quality impacts from the SLAPS to Coldwater Creek. Monitoring Station C005 is used to monitor water quality downstream from the HISS and those VPs located around Latty Avenue. Monitoring station C007, located approximately 3,700 ft downstream of the HISS, is the farthest downstream monitoring station on Coldwater Creek.

It should be noted that other non-FUSRAP industrial discharges are relatively common along the sampled reaches of Coldwater Creek; and therefore, sample parameters could be influenced by existing industrial sources other than former MED/AEC operations.

3.2.1 Coldwater Creek Surface-Water Monitoring Results

Sampling of surface water at Coldwater Creek was conducted at or below base flow elevation during the months of March and October in 2012. The base flow elevation for Coldwater Creek at the McDonnell Boulevard Bridge is 508.2 ft above mean sea level (amsl). The base flow also may be approximated by a depth measurement of 3.2 ft or less at an “average cross-section.” The monitoring of Coldwater Creek surface water included determining water quality parameters, as well as obtaining samples for metals and radionuclides as listed in Table 3-3 of EMICY12 (USACE 2011). Grab samples were collected and analyzed according to the protocol defined in the *Sampling and Analysis Guide for the St. Louis Sites* (SAG) (USACE 2000). In addition, isotopic U results were used to evaluate total U concentrations in surface water for comparison to the 30 micrograms per liter (µg/L) monitoring guide described in the ROD.

All surface-water monitoring required through implementation of the EMICY12 was conducted as planned during CY 2012 (USACE 2011). The evaluation of monitoring data demonstrates that all applicable ARARs have been met. The sample results are presented in Appendix D, Table D-1, of this report.

<u>**Water Quality Parameters**</u>

Water quality data are collected as part of the routine performance of surface-water sampling and are used as part of the overall evaluation of water quality. The water quality results for each surface-water monitoring station are summarized in Table 3-5. The average surface-water temperatures during the March and October sampling events were 14.66 and 12.85 degrees Celsius (°C), respectively. The average surface-water pH values were 6.95 and 6.52, respectively. The pH values for both sampling events were within the acceptance range (6.0 to 9.0) and thus provide suitable conditions for aquatic life.

Table 3-5. Water Quality Results for CY 2012 Coldwater Creek Surface-Water Sampling

Monitoring Parameter	Unit	Monitoring Station						Average
		C002	C003	C004	C005	C006	C007	
First Sampling Event (03/14/12)								
Temperature	Celsius (°C)	12.7	17.7	15.2	13.0	14.8	14.6	14.66
pH	standard unit	7.36	7.20	7.08	7.04	6.77	6.30	6.95
Dissolved Oxygen (DO)	milligrams per liter (mg/L)	3.58	5.10	7.43	4.14	1.83	2.81	4.14
Specific Conductivity	microSiemens per centimeter (µS/cm)	0.130	0.129	0.135	0.136	0.132	0.124	0.131
Oxidation Reduction Potential (ORP)	millivolt (mV)	47	121	-8.0	138	157	181	106
Turbidity	nephelometric turbidity units (NTU)	300	198	746	188	82.0	98.0	268.66
Second Sampling Event (10/09/12)								
Temperature	°C	13.4	13.4	13.9	12.9	11.7	11.8	12.85
pH	standard unit	6.39	6.76	6.70	6.80	6.31	6.17	6.52
DO	mg/L	7.64	10.01	11.9	9.90	7.94	1.39	8.13
Specific Conductivity	µS/cm	0.090	0.101	0.080	0.122	93.1	83.8	29.54
ORP	mV	-34.0	-19.0	-29.0	230	196	186	88.33
Turbidity	NTU	110	406	579	183	94.7	90.0	243.78

Note: Water quality data are used as part of the overall evaluation of water quality but there are no ROD defined monitoring criteria.

Average DO levels were 4.14 milligrams per liter (mg/L) in March and 8.13 mg/L in October. Specific conductivity values were higher for the March event compared to the October event. The average specific conductivity for the March sampling event was 0.131 microSiemens per centimeter (µS/cm), and the average specific conductivity for the October sampling event was 29.54 µS/cm. The average ORP value during the March sampling event (124 millivolt [mV]) was higher than that of the October sampling event (103 mV). The average turbidity value during the March sampling event (268.66 nephelometric turbidity units [NTUs]) was more than the October sampling event (243.78 NTUs).

Radiological Parameters

The radiological monitoring results for the CY 2012 Coldwater Creek surface-water sampling events are summarized in Table 3-6. Historically, FUSRAP surface-water analysis has included unfiltered water samples for the following radiological parameters: Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238. Unfiltered surface-water samples from Coldwater Creek were not analyzed for Ra-228 during CY 2012, because Ra-228 rapidly achieves equilibrium with Th-228 such that their concentrations are equal.

Table 3-6. Radiological Results for CY 2012 Coldwater Creek Surface-Water Sampling

Monitoring Parameter	Monitoring Stations					
	C002	C003	C004	C005	C006	C007
Radionuclide Concentration (pCi/L)						
First Sampling Event (03/14/12)						
Ra-226	<1.47[a]	<1.09[a]	<1.59[a]	<1.48[a]	<2.00[a]	<1.53[a]
Th-228[b]	<0.59[a]	0.43	0.65	<0.44[a]	<0.24[a]	<0.20[a]
Th-230	0.46	<0.23[a]	0.65	0.44	<0.54[a]	0.59
Th-232	<0.42[a]	<0.51[a]	<0.49[a]	<0.20[a]	<0.24[a]	<0.19[a]

Table 3-6. Radiological Results for CY 2012 Coldwater Creek Surface-Water Sampling (Continued)

Monitoring Parameter	Monitoring Stations					
	C002	C003	C004	C005	C006	C007
Radionuclide Concentration (pCi/L)						
First Sampling Event (03/14/12) (Continued)						
U-234	0.82	1.45	1.27	0.57	0.96	0.60
U-235	<0.22[a]	<0.19[a]	<0.47[a]	<0.20[a]	<0.23[a]	<0.20[a]
U-238	<0.39[a]	0.35	1.04	0.57	0.95	0.60
Second Sampling Event (10/09/12)						
Ra-226	<1.44[a]	<1.50[a]	<1.98[a]	<2.39[a]	<0.57[a]	<1.61[a]
Th-228[b]	<0.45[a]	<0.54[a]	<0.18[a]	<0.41[a]	<0.46[a]	<0.37[a]
Th-230	<0.45[a]	0.70	0.67	0.76	<0.53[a]	0.59
Th-232	<0.20[a]	<0.20[a]	<0.18[a]	<0.41[a]	<0.17[a]	<0.37[a]
U-234	<0.66[a]	1.30	0.81	0.37	<0.61[a]	<0.83[a]
U-235	<0.30[a]	<0.60[a]	<0.28[a]	<0.68[a]	<0.62[a]	<0.30[a]
U-238	0.76	0.57	0.55	0.87	0.25	<0.53[a]

[a] Reported result is less than the minimum detectable concentration (MDC) and is therefore set equal to the MDC.
[b] Ra-228 rapidly achieves equilibrium with Th-228 such that their concentrations are equal.
Note: Total U (30 µg/L) is the only ROD monitoring guide for surface water. Radiological monitoring parameters data are collected to monitor COC migration and to calculate Total U.

Surface water data for U-234, U-235, and U-238 (reported in pCi/L) were converted to µg/L and compared to the 30 µg/L criterion for total U described in the ROD. The total U concentrations in surface water were less than the 30 µg/L ROD criterion. A summary of the surface-water radiological data collected from Coldwater Creek since 2002 is presented in Table 3-7.

Table 3-7. Comparison of Historical Radiological Surface-Water Results for Coldwater Creek

Stations	Radionuclide	Units	03/02	08/02	04/03	10/03	03/04	10/04	03/05	10/05	03/06	09/06	03/07	10/07	04/08	11/08	04/09	10/09	03/10	10/10	03/11	10/11	03/12	10/12
C002	Total U[a]	µg/L	4.2	5.8	5.1	2.8	1.0	2.1	3.0	1.3	0.72	2.2	2.3	2.2	3.2	2.2	1.6	3.3	2.4	2.3	2.3	3.8	1.9	2.0
	Ra-226	pCi/L	0.32	0.0	<1.8[b]	<2.8[b]	<4.7[b]	<2.4[b]	<0.42[b]	<0.39[b]	<0.44[b]	<0.46[b]	0.52	<0.67[b]	0.81	0.34	<0.39[b]	<0.48[b]	<0.17[b]	<1.51[b]	<2.14[b]	0.87	<1.47[b]	<1.44[b]
	Th-228[c]	pCi/L	<0.43[b]	<0.72[b]	<1.6[b]	<1.0[b]	1.8	<1.5[b]	<0.97[b]	<0.45[b]	0.64	<0.38[b]	0.25	<0.53[b]	<0.20[a]	<0.40[a]	<0.59[b]	0.21	0.46	<0.78[b]	<0.52[b]	<0.55[b]	<0.59[b]	<0.45[b]
	Th-230	pCi/L	1.2	1.8	<1.8[b]	2.2	2.0	<1.2[b]	<0.97[b]	0.60	<0.55[b]	0.64	0.38	1.3	0.59	<0.40[a]	0.69	0.41	0.28	<0.68[b]	<0.52[b]	0.37	0.46	<0.45[b]
	Th-232	pCi/L	0.0	0.0	0.65	<1.0[b]	<1.5[b]	<1.2[b]	<0.36[b]	<0.45[b]	<0.77[b]	<0.38[b]	<0.17[b]	<0.38[b]	<0.20[a]	<0.18[a]	<0.59[b]	<0.41[b]	<0.19[b]	<0.68[b]	<0.17[b]	<0.20[b]	<0.42[b]	<0.20[b]
C003	Total U[a]	µg/L	3.0	2.4	4.8	3.6	3.5	2.7	4.5	2.8	2.1	1.2	3.1	2.1	4.4	3.6	3.9	3.4	5.4	2.3	6.0	3.4	2.8	2.8
	Ra-226	pCi/L	<3.8[b]	0.30	<1.7[b]	<1.4[b]	<1.3[b]	<2.0[b]	<0.41[b]	<0.45[b]	<0.41[b]	1.5	0.20	<0.54[b]	1.32	<0.49[a]	0.29	<.0.65[b]	<0.54[b]	<1.8[b]	<1.3[a]	<1.3[b]	<1.09[b]	<1.50[b]
	Th-228[c]	pCi/L	<0.52[b]	<0.20[b]	<1.3[b]	<2.3[b]	<1.2[b]	<1.9[b]	1.4	0.70	<0.54[b]	<0.50[b]	<0.54[b]	<0.42[b]	<0.44[a]	<0.33[a]	<0.50[b]	<0.48 [b]	<0.63[b]	<0.60[b]	<0.53[a]	<0.50[b]	0.43	<0.54[b]
	Th-230	pCi/L	1.5	1.7	2.2	2.5	<1.1[b]	2.0	1.6	0.63	0.55	0.67	0.44	1.3	1.32	0.58	<0.41[b]	<0.67[b]	0.60	<0.61[b]	0.52	0.48	<0.23[b]	0.70
	Th-232	pCi/L	0.0	<0.14[b]	<0.60[b]	<1.9[b]	<1.2[b]	<0.59[b]	<0.92[b]	<0.40[b]	<0.20[b]	<0.41	<0.16[b]	<0.19[b]	<0.20[a]	<0.15[a]	0.20	<0.48[b]	<0.23[b]	<0.22[b]	<0.43[b]	<0.18[b]	<0.51[b]	<0.20[b]
C004	Total U[a]	µg/L	5.0	0.80	6.4	5.5	2.8	4.0	6.4	4.4	4.3	1.9	2.7	2.1	2.4	2.6	3.4	2.1	6.4	3.0	3.0	2.3	3.4	2.2
	Ra-226	pCi/L	0.11	0.70	<2.2[b]	<2.6[b]	<3.8[b]	1.2	<0.58[b]	<0.54[b]	<0.50[b]	<0.67[b]	0.41	<0.61[b]	<0.63[a]	<0.71[a]	0.64	<0.52[b]	<0.49[b]	<1.5[b]	<1.9[b]	0.64	<1.59[b]	<1.98[b]
	Th-228[c]	pCi/L	<0.30[b]	<1.3[b]	<2.6[b]	<2.7[b]	<1.7[b]	<1.6[b]	<0.93[b]	0.31	0.45	<0.44[b]	<0.53[b]	<0.17[b]	0.31	<0.50[a]	<0.51[b]	0.32	0.52	<0.65[b]	<0.52[b]	<0.49[b]	0.65	<0.18[b]
	Th-230	pCi/L	0.59	0.65	4.2	3.1	1.6	2.2	1.3	0.47	0.55	0.71	<0.38[b]	<0.45[b]	0.79	<0.50[a]	<0.51[b]	0.83	0.55	0.58	0.43	<0.49[b]	0.65	0.67
	Th-232	pCi/L	0.0	<0.11[b]	<0.59[b]	<1.1[b]	<0.56[b]	<1.6[b]	<0.34[b]	<0.47[b]	<0.19[b]	<0.20[b]	0.19	<0.19[b]	<0.21[a]	<0.18[a]	<0.51[b]	<0.38[b]	<0.20[b]	<0.24[b]	<0.20[b]	0.25	<0.49[b]	<0.18[b]
C005	Total U[a]	µg/L	5.7	1.7	5.0	6.8	2.2	2.8	3.8	4.9	2.1	3.0	4.8	1.4	4.0	3.2	1.8	3.9	3.1	3.0	2.1	2.6	1.7	1.8
	Ra-226	pCi/L	0.40	1.5	<1.5[b]	<1.9[b]	<2.4[b]	2.8	0.83	0.68	0.57	<0.36[b]	<0.51[b]	<0.64[b]	<0.74[a]	<0.20[a]	<0.42[b]	<0.40[b]	0.26	<0.64[b]	<1.8[b]	0.68	<1.48[b]	<2.39[b]
	Th-228[c]	pCi/L	<0.37[b]	<0.91[b]	<1.1[b]	<2.7[b]	0.82	<1.3[b]	0.88	<0.41[b]	<0.56[b]	0.26	<0.39[b]	0.23	<0.46[a]	<0.68[a]	0.21	<0.72[b]	0.33	<0.19[b]	<0.39[b]	0.32	<0.44[b]	<0.41[b]
	Th-230	pCi/L	2.6	0.98	1.8	3.4	2.6	1.5	1.5	0.52	0.87	0.46	<0.39[b]	0.99	1.7	0.32	0.41	<0.23[b]	0.27	0.42	<0.39[b]	<0.64[b]	0.44	0.76
	Th-232	pCi/L	<0.24[b]	0.0	<0.51[b]	<2.4[b]	<1.2[b]	<0.59[b]	<0.32[b]	<0.41[b]	<0.45[b]	<0.39[b]	<0.39[b]	<0.56[b]	<0.21[a]	<0.17[a]	0.34	<0.23[b]	<0.18[b]	<0.51[b]	<0.18[b]	<0.3[b]	<0.20[b]	<0.41[b]
C006	Total U[a]	µg/L	5.4	2.5	5.0	7.3	15	1.4	1.3	2.1	2.0	1.9	3.5	2.2	2.9	3.2	3.2	2.5	2.8	2.6	2.8	1.9	2.8	1.2
	Ra-226	pCi/L	0.36	<2.2[b]	<2.4[b]	<0.67[b]	<2.9[b]	<1.9[b]	<0.41[b]	<0.55[b]	<0.57[b]	<0.55[b]	0.51	<0.46[b]	<0.66[a]	0.91	5.26	<0.56[b]	<0.42[b]	<0.64[b]	<1.82[b]	<1.26[a]	<2.00[b]	<0.57[b]
	Th-228[c]	pCi/L	0.02	<0.88[b]	<2.2[b]	<2.4[b]	<1.9[b]	<1.3[b]	0.54	0.73	<0.56[b]	<0.59[b]	<0.43[b]	<0.36[b]	<0.56[a]	<0.39[a]	0.56	<0.42[b]	<0.42[b]	<0.19[b]	<0.44[b]	<0.57[b]	<0.24[b]	<0.46[b]
	Th-230	pCi/L	0.88	0.96	4.6	2.0	1.5	2.4	1.9	1.2	0.83	<0.52[b]	<0.16[b]	0.36	0.60	0.53	<0.48[b]	0.50	0.35	0.42	0.45	0.38	<0.54[b]	<0.53[b]
	Th-232	pCi/L	0.0	<0.11[b]	<1.2[b]	<1.1[b]	<1.5[b]	<0.60[b]	0.18	<0.20[b]	<0.18[b]	<0.19[b]	<0.16[b]	<0.16[b]	<0.20[a]	<0.39[a]	<0.22[b]	<0.19[b]	<0.42[b]	<0.51[b]	<0.21[b]	<0.26[b]	<0.24[b]	<0.17[b]
C007	Total U[a]	µg/L	7.9	3.1	4.1	4.7	1.2	2.1	1.9	2.1	1.9	1.7	3.1	1.7	2.7	1.8	2.3	3.0	2.5	2.8	2.6	1.6	1.9	1.3
	Ra-226	pCi/L	0.84	0.48	<1.5[b]	<1.9[b]	<2.2[b]	<1.7[b]	<0.79[b]	<0.43[b]	<0.58[b]	<0.40[b]	0.55	<0.46[b]	<0.81[a]	<0.18[a]	<0.51[b]	0.22	<0.19[b]	<2.24[b]	<1.2[b]	<1.4[b]	<1.53[b]	<1.61[b]
	Th-228[c]	pCi/L	1.2	1.9	<1.7[b]	<2.0[b]	1.8	<1.2[b]	0.78	0.42	<0.41[b]	<0.38[b]	<0.17[b]	<0.47[b]	0.51	0.18	<0.23[b]	<0.46[b]	<0.47[b]	0.53	<0.43[b]	<0.40[b]	<0.20[b]	<0.37[b]
	Th-230	pCi/L	2.4	3.1	2.4	2.3	2.5	2.2	<0.44[b]	1.3	0.62	0.45	<0.17[b]	0.99	1.03	0.47	0.25	<0.46[b]	0.51	<0.49[b]	0.59	0.40	0.59	0.59
	Th-232	pCi/L	<0.11[b]	<0.20[b]	<0.55[b]	<1.1[b]	0.86	<0.52[b]	<0.36[b]	<0.36[b]	<0.19[b]	<0.18[b]	<0.17[b]	<0.38[b]	<0.41[a]	<0.16[a]	<0.23[b]	<0.21[b]	<0.21[b]	<0.40[b]	<0.20[b]	<0.18[b]	<0.19[b]	<0.37[b]

[a] Total U is equal to the sum of the concentrations of U isotopes in pCi/L divided by 0.677, where 0.677 microgram per picocurie is the specific activity for total U, assuming secular equilibrium.
[b] Reported result is less than the MDC and is therefore set equal to the MDC.
[c] Ra-228 rapidly achieves equilibrium with Th-228 such that their concentrations are equal.
Note: Total U (30 µg/L) is the only ROD monitoring guide for surface water. The other radiological monitoring parameters data are collected to monitor COC migration.

Chemical Parameters

The chemical monitoring results for the CY 2012 Coldwater Creek surface-water sampling events are presented in Table 3-8.

Table 3-8. Chemical Results for CY 2012 Coldwater Creek Surface-Water Sampling

Monitoring Parameter	Monitoring Stations					
	C002	C003	C004	C005	C006	C007
Target Analyte List Metals Concentration (μg/L)						
First Sampling Event (03/14/12)						
Antimony	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]
Arsenic	2.9	2.9	3.0	1.7	2.9	2.7
Barium	140	135	130	129	139	128
Cadmium	0. 11	<0. 1[a]	0.13	<0. 1[a]	<0. 1[a]	<0. 1[a]
Chromium	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]
Molybdenum	10.6	9.0	9.3	3.6	8.7	8.3
Nickel	2.0	2.1	2.9	3.2	2.7	2.8
Selenium	1.7	3.5	2.7	1.8	2.3	2.7
Thallium	0.68	0.67	2.0	<0.55[a]	<0.55[a]	<055[a]
Vanadium	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]
Second Sampling Event (10/09/12)						
Antimony	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]	<1.7[a]
Arsenic	2.3	2.8	2.6	2.7	2.4	1.9
Barium	83.4	96.3	129	122	124	106
Cadmium	0.15	<0. 1[a]	0.12	<0. 1[a]	<0. 1[a]	<0. 1[a]
Chromium	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]	<3.3[a]
Molybdenum	17.8	18.2	20.2	21.3	17.0	15.6
Nickel	1.8	2.2	2.8	2.9	3.4	2.6
Selenium	2.9	1.6	2.8	2.9	2.0	2.8
Thallium	0.7	1.1	0.57	<0.55[a]	<0.55[a]	<055[a]
Vanadium	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]	<2.4[a]

[a] Reported result is less than the DL and is therefore set equal to the DL.

Note: There are no chemical-specific ROD monitoring guidelines for surface water. Chemical monitoring parameters data are collected to monitor COC migration.

3.2.2 Coldwater Creek Sediment Monitoring Results

During CY 2012, sediment sampling at Coldwater Creek was conducted during the months of March and October as part of the EMP. Sediment samples were collected in depositional environments near each of the six previously described surface-water locations (C002 through C007) (Figure 3-3) and analyzed according to the methods described in the SAG (USACE 2000). Sediment samples, collected for the EMP, were evaluated for the radiological and metal constituents listed in Table 3-3 of the EMICY12 (USACE 2011).

All sediment monitoring required through implementation of the EMICY12 was conducted as planned during CY 2012 (USACE 2011). The evaluation of monitoring data demonstrates that all applicable ARARs have been met. The analytical results from these monitoring activities are presented in Appendix D, Table D-2, of this report.

Radiological Parameters

The radiological results for CY 2012 Coldwater Creek sediment sampling events are presented in Table 3-9. The ROD (USACE 2005) established sediment RGs for Ra-226, Th-230, and U-238 at the NC Sites. Therefore, sediment sampling results for those radionuclides were compared against their corresponding RGs. Sediment samples from Coldwater Creek were not analyzed for U-234 during CY 2012, because U-234 is assumed to be in equilibrium with U-238.

Table 3-9. Radiological Results for CY 2012 Coldwater Creek Sediment Sampling

Monitoring Parameter	RGs[a]	Monitoring Stations					
		C002	C003	C004	C005	C006	C007
Radionuclide Concentration (picocuries per gram [pCi/g])							
First Sampling Event (03/14/12)							
Ac-227	No RG	<0.12[b]	<0.23[b]	<0.34[b]	<0.59[b]	<0.24[b]	<0.22[b]
Pa-231	No RG	<0.34[b]	<0.58[b]	<.84[b]	<1.66[b]	<0.72[b]	<0.57[b]
Ra-226	15	0.89	1.07	1.13	1.47	1.16	1.23
Ra-228	No RG	0.24	0.81	0.85	0.92	1.06	0.89
Th-228[c]	No RG	0.37	1.69	1.72	1.05	1.38	2.07
Th-230[c]	43	0.52	1.81	2.41	4.3	3.39	3.51
Th-232[c]	No RG	0.35	1.28	1.45	1.01	1.00	1.14
U-235	No RG	<0.15[b]	<0.27[b]	<0.41[b]	<0.73[b]	<0.31[b]	<0.27[b]
U-238[d]	150	0.41	<0.76[b]	1.32	1.98	1.13	1.20
Second Sampling Event (10/09/12)							
Ac-227	No RG	<0.14[b]	<0.25[b]	<0.19[b]	<0.21[b]	<0.24[b]	<0.20[b]
Pa-231	No RG	<0.32[b]	<0.67[b]	<0.54[b]	<0.56[b]	<0.71[b]	<0.50[b]
Ra-226	15	0.91	1.33	1.28	1.33	1.02	1.06
Ra-228	No RG	0.37	0.78	0.86	0.90	0.94	0.80
Th-228[c]	No RG	0.37	1.23	1.24	1.30	1.03	0.96
Th-230[c]	43	0.64	1.19	1.28	5.42	1.78	2.73
Th-232[c]	No RG	0.47	1.18	1.13	1.23	1.30	0.70
U-235	No RG	<0.16[b]	<0.31[b]	<0.25[b]	<0.25[b]	<0.31[b]	<0.23[b]
U-238[d]	150	0.56	0.88	1.50	1.25	0.99	1.51

[a] RGs presented in the ROD (USACE 2005).
[b] Reported result is less than the MDC and is therefore set equal to the MDC.
[c] Both gamma-spec and alpha spec results produced; alpha-spec results reported.
[d] U-238 and U-234 assumed to be in equilibrium.

All sediment data results were below the RGs established by the ROD. The historical radiological sediment sampling information for all monitoring stations since 2002 is summarized in Table 3-10.

Chemical Parameters

Chemical monitoring results for CY 2012 Coldwater Creek sediment sampling events are presented in Table 3-11.

3.2.3 Impact of FUSRAP Coldwater Creek Remedial Action on Total Uranium Concentrations in Coldwater Creek Surface Water and Sediment

As part of the FUSRAP RA at the SLAPS, sediment and soil were removed from the bed and banks of Coldwater Creek near monitoring stations C002 and C003 during August of 2004. An evaluation was conducted to determine if the SLAPS RA resulted in increased levels of uranium in Coldwater Creek. The concentrations of radionuclides in sediment and surface-water samples from various stations along Coldwater Creek were assessed. Radionuclide data from surface-water and sediment samples collected from March of 2000 to March of 2004 were used to create a baseline for comparison with sample results collected after the RA.

Table 3-10. Comparison of Historical Radiological Sediment Results for Coldwater Creek

Stations	Radionuclide	Units	03/02	08/02	04/03	10/03	03/04	10/04	03/05	10/05	03/06	09/06	03/07	10/07	04/08	11/08	03/09	10/09	03/10	10/10	03/11	10/11	03/12	10/12
C002	Total U[a]	pCi/g	0.48	0.42	1.5	3.9	1.8	1.1	0.91	0.93	1.2	1.7	0.97	1.1[b]	1.7	0.73	0.80	0.89	1.3	1.3	1.4	1.1	0.84	1.21
	Ra-226	pCi/g	0.86	1.0	0.88	0.93	0.99	0.89	0.92	0.69	0.74	0.72	0.97	<0.37[b,c]	1.0	0.85	0.75	1.07	0.71	0.95	0.87	0.85	0.89	0.911
	Ra-228	pCi/g	0.22	0.19	0.21	0.24	0.28	0.16	0.26	0.26	0.22	0.29	0.20	0.18	0.20	0.17	0.20	0.24	0.30	0.33	0.27	0.28	0.24	0.372
	Th-228	pCi/g	0.33	0.92	0.58	0.38	0.49	0.40	0.51	0.61	0.75	0.67	0.26	0.24[b]	0.53	0.41	0.50	0.35	0.46	0.44	0.26	0.37	0.37	0.37
	Th-230	pCi/g	1.52	<0.71[c]	0.67	0.81	1.0	1.0	0.78	0.98	1.1	1.3	1.2	0.84[b]	0.92	1.1	0.51	1.2	0.67	1.2	1.5	1.1	0.52	0.64
	Th-232	pCi/g	0.31	0.45	0.19	0.17	0.12	<0.27[c]	<0.26[c]	0.41	0.30	0.22	0.46	<0.24[b,c]	0.24	<0.26[c]	0.28	0.31	0.53	0.21	<0.29[c]	0.39	0.35	0.47
C003	Total U[a]	pCi/g	0.63	0.98	1.4	3.3	1.8	0.85	1.6	2.0	1.4	1.4	1.2	2.0[b]	1.9	2.3	1.2	2.9	0.72	1.7	1.4	1.5	1.20	1.78
	Ra-226	pCi/g	0.78	1.4	0.72	0.96	0.81	0.92	1.0	1.5	1.1	1.3	1.5	1.7[b]	1.1	1.1	0.79	1.4	0.98	1.1	0.73	1.2	1.07	1.33
	Ra-228	pCi/g	0.32	0.73	0.30	0.25	0.38	0.33	0.59	0.86	0.45	0.38	0.68	0.49	0.49	0.57	0.40	1.0	0.44	0.36	0.39	0.79	0.81	0.78
	Th-228	pCi/g	0.45	1.1	1.3	0.47	0.74	0.57	1.1	0.92	1.2	0.34	0.97	0.53[b]	0.70	0.66	0.64	1.1	0.85	0.42	0.55	1.79	1.69	1.23
	Th-230	pCi/g	1.3	2.3	1.4	0.81	2.4	3.3	3.5	1.5	2.6	3.8	1.2	1.5[b]	2.1	2.3	1.2	1.5	1.0	1.1	0.89	1.9	1.81	1.19
	Th-232	pCi/g	<0.31[c]	0.7	0.35	0.14	0.35	0.41	0.75	0.71	0.69	0.43	0.38	0.46[b]	0.51	0.57	0.34	0.73	0.43	0.17	0.64	1.22	1.28	1.18
C004	Total U[a]	pCi/g	0.62	0.71	2.1	5.2	2.9	1.6	2.1	2.1	1.6	1.9	2.7	7.3[b,d]	2.0	2.3	2.0	3.3	1.8	2.6	1.8	2.0	2.84	3.09
	Ra-226	pCi/g	0.9	1.4	1.0	1.1	0.93	1.1	1.0	1.3	1.2	1.2	1.3	1.6[b]	1.0	1.0	0.97	1.3	1.3	1.5	1.1	1.3	1.13	1.28
	Ra-228	pCi/g	0.32	0.83	0.82	0.90	0.83	0.72	0.85	0.87	0.83	0.74	0.80	0.81	0.70	1.0	0.73	0.85	0.62	0.81	0.85	0.96	0.85	0.86
	Th-228	pCi/g	0.42	0.96	0.94	1.4	1.7	1.6	0.99	1.1	0.9	0.93	1.7	1.3[b]	1.2	1.4	0.83	1.1	0.90	1.2	1.4	1.3	1.72	1.24
	Th-230	pCi/g	3.0	1.3	1.7	1.6	2.4	1.4	2.0	2.2	2.2	2.1	2.6	2.2[b]	2.0	1.0	1.7	2.0	2.2	1.6	2.7	3.8	2.41	1.28
	Th-232	pCi/g	1.0	0.81	0.99	0.84	1.0	0.92	0.82	0.86	1.0	0.85	0.79	0.97[b]	1.3	0.80	0.82	1.0	0.77	1.0	0.85	1.1	1.45	1.13
C005	Total U[a]	pCi/g	0.71	1.1	2.4	5.4	2.2	1.8	3.3	2.0	2.3	2.0	0.94	2.0[b]	2.0	3.6	1.6	2.8	1.6	3.6	1.8	2.5	4.36	2.5
	Ra-226	pCi/g	1.2	1.9	1.7	2.2	1.3	1.9	1.6	1.8	1.4	1.4	1.7	1.6[b]	1.1	5.4	1.0	1.4	1.5	2.5	1.2	1.5	1.47	1.33
	Ra-228	pCi/g	0.4	0.55	0.66	0.74	0.53	0.53	0.85	0.73	0.78	0.53	0.98	0.58	0.78	1.1	0.31	0.86	0.73	0.88	0.56	0.94	0.92	0.90
	Th-228	pCi/g	0.73	1.2	1.2	1.3	0.98	0.79	0.99	0.95	1.5	1.0	1.5	0.68[b]	0.98	1.7	0.50	1.3	0.92	0.96	0.61	0.61	1.05	1.30
	Th-230	pCi/g	3.6	14	8.7	23	3.8	3.5	8.4	4.5	11	11	4.7	3.7[b]	6.6	82.6	4.2	9.6	2.2	19.6	3.9	3.4	4.3	5.42
	Th-232	pCi/g	0.21	0.86	1.0	0.69	0.57	0.20	0.43	0.57	1.3	0.77	1.6	0.45[b]	0.98	1.4	0.50	0.87	0.65	1.1	0.63	0.87	1.01	1.23
C006	Total U[a]	pCi/g	0.91	0.69	1.8	4.8	1.0	1.9	2.6	1.8	2.7	2.3	2.9	2.3[b]	1.7	1.8	2.1	0.75	1.9	2.2	2.0	1.0	2.35	1.97
	Ra-226	pCi/g	1.2	1.3	1.3	1.1	1.1	1.1	1.2	1.3	1.3	1.3	1.4	0.94[b]	1.0	1.4	1.0	1.1	1.7	1.7	1.3	0.90	1.16	1.02
	Ra-228	pCi/g	0.85	0.86	0.87	0.86	0.94	0.74	0.94	1.0	0.74	0.92	0.97	0.93	0.88	0.98	0.82	0.99	0.88	0.88	0.86	0.48	1.06	0.94
	Th-228	pCi/g	1.5	1.2	1.2	1.7	1.6	2.0	1.4	1.2	0.92	2.0	0.99	1.6[b]	1.7	0.94	1.5	1.6	1.0	0.82	1.9	0.54	1.38	1.03
	Th-230	pCi/g	2.9	1.4	1.7	3.7	3.2	3.1	2.2	2.1	2.8	3.2	1.8	2.7[b]	3.4	2.2	2.2	2.6	2.0	4.1	9.7	1.2	3.39	1.78
	Th-232	pCi/g	0.91	0.84	1.0	1.2	0.79	0.64	1.3	0.98	1.3	0.85	1.1	1.4[b]	1.1	1.2	1.1	0.97	0.80	0.71	1.6	0.82	1.00	1.30
C007	Total U[a]	pCi/g	1.3	1.2	2.4	6.0	0.90	0.99	2.8	1.6	2.1	1.9	2.0	2.3[b]	1.4	2.3	1.9	2.6	2.2	1.7	1.9	2.4	2.45	3.08
	Ra-226	pCi/g	1.2	1.6	1.1	1.3	1.4	1.5	1.1	1.5	1.3	1.5	1.9	1.1[b]	1.1	1.4	1.1	1.3	1.4	1.4	1.3	1.4	1.23	1.06
	Ra-228	pCi/g	0.85	0.74	0.85	0.95	1.1	0.90	0.87	0.90	0.99	0.87	0.79	0.84	0.69	0.89	0.77	0.77	0.82	0.73	0.87	0.81	0.89	0.80
	Th-228	pCi/g	1.6	1.1	1.4	1.5	2.1	1.4	0.79	1.2	1.2	1.0	1.2	1.5[b]	0.73	0.67	1.1	0.66	1.0	0.78	1.4	1.3	2.07	0.96
	Th-230	pCi/g	2.8	4.7	2.8	4.2	2.0	3.5	5.6	2.9	3.8	2.8	19	4.6[b]	3.8	3.6	3.6	2.3	2.6	4.4	3.3	2.8	3.51	2.73
	Th-232	pCi/g	1.1	0.74	0.79	0.66	1.4	0.94	0.98	1.4	1.1	0.84	1.2	0.83[b]	0.55	0.72	1.00	0.57	1.04	0.72	0.93	0.95	1.14	0.70

[a] Total U is equal to the sum of the concentrations of U isotopes (Office of the Federal Register, NARA 1998).
[b] Both gamma-spec and alpha-spec results produced, for Table 3-11 gamma-spec results reported.
[c] Reported result is less than the MDC and is therefore set equal to the MDC.
[d] The 7.3 pCi/g value for total U obtained on 10/07 from C004 was a typographical error and the result should be reported as 1.3.

Note: The sediment RGs for Ra-226, Th-230, and U-238 are 15 pCi/g, 43 pCi/g, and 150 pCi/g, respectively. The other radiological monitoring parameters data are collected to monitor COC migration.

Table 3-11. Chemical Results for CY 2012 Coldwater Creek Sediment Sampling

Monitoring Parameter	Monitoring Stations					
	C002	C003	C004	C005	C006	C007
Target Analyte List Metals Concentration (milligrams per kilogram [mg/kg])						
First Sampling Event (03/14/12)						
Antimony	<0.8[a]	<0.96[a]	1.6	2.5	<0.98[a]	1.2
Arsenic	5.3	3.6	6.5	7.1	2.7	4.7
Barium	18.2	61.7	153	185	86.8	104
Cadmium	<0.12[a]	0.32	0.87	1.2	0.17	0.49
Chromium	<0.38[a]	9.8	22.6	26.6	10.5	13.6
Molybdenum	<1.2[a]	<1.5[a]	<1.9[a]	<2.7[a]	<1.5[a]	<1.6[a]
Nickel	2.4	9.4	17.6	21.0	11.5	13.0
Selenium	<0.62[a]	<0.75[a]	<0.97[a]	<1.3[a]	<0.77[a]	<0.78[a]
Thallium	<1.9[a]	<2.3[a]	<2.9[a]	<4.0[a]	<2.3[a]	<2.4[a]
Vanadium	6.4	13.9	21.0	23.9	14.0	15.7
Second Sampling Event (10/09/12)						
Antimony	<7.6[a]	<8.5[a]	<10.8[a]	<9.5[a]	<9.2[a]	<10.5[a]
Arsenic	3.9	<4.2[a]	<5.4[a]	4.8	11.1	<5.2[a]
Barium	543	41.2	161	134	125	128
Cadmium	<1.2[a]	<1.3[a]	<1.7[a]	<1.5[a]	<1.4[a]	<1.6[a]
Chromium	12.0	8.1	27.0	21.4	15.1	20.0
Molybdenum	<11.9[a]	<13.3[a]	<16.9[a]	<14.8[a]	<14.4[a]	<16.4[a]
Nickel	7.5	9.1	19.1	17.7	17.9	16.6
Selenium	<5.9[a]	<6.7[a]	<8.4[a]	<7.4[a]	<7.2[a]	<8.2[a]
Thallium	<17.9[a]	<20.1[a]	<25.5[a]	<22.4[a]	<21.7[a]	<24.8[a]
Vanadium	<15.0[a]	<16.8[a]	22.1	21.7	25	23.5

[a] Reported result is less than the DL and is therefore set equal to the DL.

Note: There are no chemical specific ROD RGs or monitoring guidelines for sediment. Chemical monitoring parameters data are collected to monitor COC migration.

Methodology

Total U results from surface-water and sediment samples from the six monitoring stations (C002 through C007) for 2012 were compared to the 2000 to 2004 dataset for this evaluation. Total U was selected for this evaluation, because it is among the most mobile of all the radionuclide COCs present at the SLAPS.

Qualitative trend line graphs of total U results from surface-water samples collected at monitoring stations C002 through C007 from March of 2000 to October of 2012 are presented on Figure 3-4. The mean, 95 percent upper confidence limit (UCL_{95}), and 95 percent lower confidence limit (LCL_{95}) concentrations of total U calculated from the March 2000 to March 2004 dataset are also shown on this figure.

Qualitative trend line graphs of total U results from sediment samples collected at monitoring stations C002 through C007 from March of 2000 to October of 2012 are presented on Figure 3-5. The mean, UCL_{95}, and LCL_{95} concentrations of total U calculated from the March 2000 to March 2004 dataset are also shown on this figure.

The total U concentration statistics for surface water and sediment in Coldwater Creek for 2000 through 2004 are presented in Table 3-12.

Table 3-12. Total U Concentration Statistics for Coldwater Creek (2000-2004)

Stations	Statistics for Total U in Surface Water March 2000 to March 2004 data (pCi/L)			Statistics for Total U in Sediment March 2000 to March 2004 data (pCi/g)		
	UCL_{95}	Mean	LCL_{95}	UCL_{95}	Mean	LCL_{95}
C002	4.2	3.1	1.9	1.7	1.4	1.1
C003	3.8	3.3	2.7	1.9	1.5	1.0
C004	4.5	3.4	2.3	2.3	1.7	1.2
C005	4.1	3.0	1.9	2.8	2.4	2.0
C006	8.2[a]	5.0	[b]	3.0	2.4	1.8
C007	4.7	3.4	0.75	2.5	1.9	1.3

[a] March 2000 to March 2004 data are gamma distributed. Therefore, approximate gamma upper confidence limit (UCL) used.
[b] LCL_{95} not calculated due to gamma distributed data.

Conclusion

The data fit two hypothetical scenarios. First, the post-RA sampling results were not significantly below the pre-RA sampling results for downstream stations at the SLAPS (C003 through C007), so it is unlikely that total U on the SLAPS was causing a significant contribution to Coldwater Creek. The RA over time should markedly reduce the total U load in Coldwater Creek if the SLAPS were a significant contributor. While a time lag in the fate downstream could occur, the current total U concentrations are already low. Second, the RA within Coldwater Creek did not adversely impact concentrations of total U in Coldwater Creek surface water or sediment. Had the RA contributed adversely, an excessive short-term increase in total U concentrations could have been observed.

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4.0 EVALUATION OF GROUND-WATER MONITORING DATA

Eighteen ground-water monitoring wells were sampled at the NC Sites during CY 2012. Ground water was sampled following protocol for individual wells and analytes and was analyzed for various radiological constituents and inorganic analytes. Static water levels were measured quarterly at the retained monitoring wells. In addition, field parameters were measured continuously during purging of the wells before sampling. The static water levels and other ground-water field parameter results for CY 2012 sampling are presented in Appendix E, Tables E-1 and E-2. Summary tables providing the NC Sites ground-water analytical sampling results for CY 2012 are found in Appendix E, Tables E-3 and E-4.

Ground-Water Guidelines

The CY 2012 ground-water monitoring data for the NC Sites are compared to the ROD ground-water monitoring guidelines listed in Tables F-1 and F-2 in Appendix F of this EMDAR. The ROD ground-water monitoring guidelines (i.e., ROD guidelines) for the NC Sites are based on requirements specified in the ROD (USACE 2005) and are further explained in Sections 4.1.1 and 4.2.1.

Stratigraphy at the North St. Louis County Sites

The stratigraphic units present at the NC sites are shown in the stratigraphic column presented on Figure 4-1. Fill and topsoil (Unit 1) overlie Pleistocene loess (Unit 2) and glaciolacustrine deposits. The glaciolacustrine sediments consist of Subunit 3T (silty clay), Subunit 3M (moderately to highly plastic clay), Subunit 3B (silty clay), and Unit 4 (clayey and sandy gravel). Beneath these unconsolidated deposits, the bedrock is composed of Mississippian limestone (Unit 6). Stratigraphic Unit 5, Pennsylvanian shale bedrock, is not present at the HISS or Futura but is found directly overlying Unit 6 under portions of the SLAPS.

4.1 LATTY AVENUE PROPERTIES

The Latty Avenue Properties include the HISS, Futura, and eight Latty Avenue VPs (VPs 01L through 06L, VP-40A, and Parcel 10K530087). The ground-water monitoring wells at the Latty Avenue Properties are located on or immediately adjacent to the HISS and Futura.

Stratigraphy at the Latty Avenue Properties

Four HZs (HZ-A through HZ-C, and HZ-E) have been identified at the Latty Avenue Properties. The shallow ground-water zone, HZ-A, consists of the fine-grained silts and clays of Unit 1, Unit 2, and Subunit 3T. Underlying HZ-A is HZ-B, which consists of a highly impermeable clay (Subunit 3M). HZ-C consists of silty clay, clayey silt, and clayey gravel deposits that make up the stratigraphic Subunit 3B and Unit 4. The Mississippian limestone bedrock is defined as HZ-E. HZ-E is the protected aquifer for the site. As a result of their very low permeability, Subunits 3M and 3B limit vertical ground-water movement between HZ-A and the deep ground-water zones (HZ-C and HZ-E) at the Latty Avenue Properties.

Summary of CY 2012 Ground-Water Monitoring Results at the Latty Avenue Properties

Based on an evaluation of the ground-water data at the Latty Avenue Properties, two inorganic soil COCs (arsenic and molybdenum) and three radiological soil COCs (U-234, U-238, and total U) were detected at concentrations above the ROD guidelines in HZ-A ground water at the Latty Avenue Properties in CY 2012. However, molybdenum does not exceed its ROD guideline when measurement error is taken into account. The concentration of arsenic in HW22 has been above the ROD guideline for more than 12 months. In addition, the three radiological COCs (U-234, U-238, and total U) have been above their ROD guidelines for more than a 12-month period in HZ-A ground water at HISS-01, based on previous sampling results. Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water.

One HISS monitoring well, HW23, is screened in HZ-C ground water. Because the COC concentrations in HW23 have been low and relatively stable, this well was not sampled during CY 2012. The next sampling event for this well is tentatively scheduled for the second quarter of CY 2013.

4.1.1 Evaluation of Ground-Water Monitoring Data at the Latty Avenue Properties

The ground-water monitoring data for the Latty Avenue Properties are evaluated against the requirements for ground-water monitoring identified in the ROD (USACE 2005). The ROD specifies two types of ground-water monitoring guidelines: (1) response-action monitoring guidelines and (2) a total U monitoring guideline (which is used for both response-action and long-term monitoring). Response-action monitoring of HZ-A and HZ-C is being conducted to ensure that the RA does not degrade current ground-water conditions. Another purpose of the response-action ground-water monitoring of HZ-C is to document the protection of the limestone aquifer (HZ-E) during the RA.

The response-action monitoring guideline is two times the UCL_{95}, based on historical concentrations of the analyte in a particular well before RAs were initiated under the ROD. The response-action monitoring guidelines have been developed for the ROD soil COCs for each of the wells at the Latty Avenue Properties. The methodology for the development of the response-action monitoring guidelines is detailed in Appendix F of this document. The total U guideline is defined in the ROD to be equal to the total U maximum contaminant level of 30 µg/L (USACE 2005). If total U levels exceed 30 µg/L, monitoring would continue subject to a 5-year review.

In addition to the previous requirements, an evaluation of concentration trends over time is conducted for the COCs detected above the ROD guidelines in ground water to support assessment of the effectiveness of the RA in the CERCLA 5-year reviews.

Monitoring Well Network at the Latty Avenue Properties

The CY 2012 EMP well network for the Latty Avenue Properties is shown on Figure 4-2. With the exception of monitoring well HW23, which is screened in HZ-C, the monitoring wells are screened in HZ-A. The screened HZs for the ground-water monitoring wells at the Latty Avenue Properties are identified in Table 4-1.

Table 4-1. Screened HZs for Ground-Water Monitoring Wells at the Latty Avenue Properties During CY 2012

Well ID	Screened HZs
HISS-01[a]	HZ-A
HISS-06A [a]	HZ-A
HISS-10	HZ-A
HISS-11A [a]	HZ-A
HISS-17S [a]	HZ-A
HISS-19S [a]	HZ-A
HW22 [a]	HZ-A
HW23	HZ-C

[a] Wells sampled in CY 2012.

Ground-water sampling was conducted at six ground-water monitoring wells at the Latty Avenue Properties during CY 2012. First-quarter sampling was conducted on February 28, 2012; second-quarter sampling was conducted on May 29, 2012; third-quarter sampling was conducted on August 21, 2012; and fourth-quarter sampling was conducted on December 11, 2012.

HZ-A Ground Water

Ground-water samples were collected from six HZ-A wells during CY 2012. Summary tables presenting the analytical data for all analytes are included in Appendix E.

For response-action monitoring, the CY 2012 ground-water data were evaluated to determine if ground-water conditions have significantly degraded. Continued monitoring of HZ-A could be required long term if significantly degraded ground-water conditions are found. Based on the ROD, a significantly degraded ground-water condition requires all of the following:

1) that soil COC concentrations have statistically increased in ground water (relative to the well's historical data and accounting for uncertainty) for more than a 12-month period. Significantly increased concentrations are defined as doubling of an individual COC concentration above the upper confidence limit (UCL) of the mean (based on the historical concentration before RA) for a period of 12 months;
2) that the degraded well is close enough to impact Coldwater Creek; and
3) that a significant degrading of Coldwater Creek surface water is anticipated.

The CY 2012 results were compared to the ROD guidelines for the soil COCs identified in the ROD (i.e., antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238). Those soil COCs with concentrations above the ROD guidelines in HZ-A ground-water samples at the Latty Avenue Properties during CY 2012 are listed in Table 4-2. Because no ground-water sampling data is available for HISS-06A and HISS-11A prior to CY 2011, the ROD guidelines for HISS-06A and HISS-11A were developed using the pre-2006 data from the wells previously at these locations (HISS-06 and HISS-11, respectively).

Table 4-2. Analytes Exceeding ROD Guidelines in HZ-A Ground Water at the Latty Avenue Properties During CY 2012

Analyte	Units	Station	ROD Guidelines[a]	Minimum Detected	Maximum Detected	Mean Detected	# Detects > ROD Guidelines[a]	Frequency of Detection
Arsenic	μg/L	HW22	2.4	119	119	119	1	1/1
Molybdenum	μg/L	HW22	3.4	6.7[b]	6.7[b]	6.7[b]	1	1/1
U-234	pCi/L	HISS-01	12	17.4	19.2	18.3	2	2/2
U-235[c]	pCi/L	HISS-01	---	0.5	0.7	0.6	0	2/2
U-238	pCi/L	HISS-01	13	11.7	19.1	15.4	1	2/2
Total U[d]	μg/L	HISS-01	30	35.2	57.3	46.3	2	2/2

[a] ROD guidelines include the response-action monitoring guidelines and the total U monitoring guideline of 30 μg/L. Response-Action Monitoring Guideline = 2 x UCL_{95}, based on historical concentrations before RAs were initiated (USACE 2005). Results are reported to two significant digits.
[b] The concentrations of molybdenum in HW22 are not above the ROD guideline when the measurement error (5 μg/L) is taken into account.
[c] The results for U-235 do not exceed the ROD guidelines. The U-235 results are provided because they were used in the total U calculation.
[d] Total U values were calculated from isotopic concentrations in pCi/L and converted to μg/L using radionuclide-specific activities using the following formula: total U (μg/L) = U-234(pCi/L)/6240 + U-235 (pCi/L)/2.16 + U-238 (pCi/L)/0.335.
Shaded cells represent results that do not exceed ROD guidelines.
--- No monitoring guideline due to lack of detected results in historical dataset.

Two inorganic soil COCs were detected at concentrations above the ROD guidelines in HZ-A ground water at the Latty Avenue Properties: arsenic (HW22) and molybdenum (HW22). The concentrations of molybdenum in HW22 are not above the ROD guidelines when measurement error is taken into account. The concentrations of arsenic at HW22 were above the ROD guideline during the third-quarter sampling event conducted at HW22 in CY 2012, as well as in the previous CY 2011 sampling events. Therefore, concentrations of arsenic at HW22 have been above the ROD guidelines for more than 12 months. The concentrations of arsenic in Coldwater Creek surface water and sediment in CY 2012 are low, supporting the conclusion that elevated arsenic concentrations are localized to HW22 and are not impacting Coldwater Creek. Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water.

Concentrations of the radiological COCs U-234 and U-238 were above the ROD guidelines in HZ-A ground water at the Latty Avenue Properties in CY 2012. The concentrations of U-234 and U-238 were above the ROD guidelines in HISS-01 during the first-and third-quarter sampling events conducted at HISS-01 in CY 2012, as well as in the sampling events conducted in CY 2011. Therefore, U-234 and U-238 have exceeded the ROD guidelines for more than 12 months at HISS-01.

The ROD guideline for total U (30 µg/L) is used for both response-action and long-term monitoring of ground water at the Latty Avenue Properties. Total U concentrations were compared to the 30 µg/L monitoring guideline. Total U concentrations (in µg/L) were calculated as follows from the isotopic results (in pCi/L) and the specific activities (in picocuries per microgram [pCi/µg]) for each radionuclide.

$$TotalU\left(\frac{\mu g}{L}\right)=\left[\frac{U^{234}\left(\frac{pCi}{L}\right)}{6240\left(\frac{pCi}{\mu g}\right)}\right]+\left[\frac{U^{235}\left(\frac{pCi}{L}\right)}{2.16\left(\frac{pCi}{\mu g}\right)}\right]+\left[\frac{U^{238}\left(\frac{pCi}{L}\right)}{0.335\left(\frac{pCi}{\mu g}\right)}\right]$$

Total U concentrations in samples collected from HISS-01 again exceeded the 30 µg/L monitoring guideline creating an exceedance period of more than 12 months. Based on trend analysis, total U concentrations have shown a statistically significant increase at HISS-01 from CY 1999 to CY 2012. However, Coldwater Creek surface-water sampling results for CY 2012, presented in Section 3.2, indicate there has not been an increase in total U concentrations. Therefore, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water at the Latty Avenue Properties.

In summary, comparison of the data to the ROD guidelines indicate that one inorganic soil COC (arsenic) and three radiological COCs (U-234, U-238, and total U) exceeded the ROD guidelines for a period of at least 12 months. However, because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water.

HZ-C Ground Water

One HISS monitoring well, HW23, is screened in HZ-C ground water. Because COC concentrations in HW23 have been low and relatively stable based on ground-water samples collected since the third-quarter sampling event of CY 2000, this well was not sampled during CY 2012. During sampling events conducted between CY 2000 and CY 2011 in HW23, no inorganic soil COCs and only one radiological soil COC, U-234, were detected at levels greater than the ROD guidelines when measurement error was taken into account. The U-234 ROD guideline (3.8 pCi/L) was not exceeded in the most recent sampling event (third quarter of CY 2011) when measurement error was taken into consideration. Total U concentrations have never been detected at levels greater than the ROD guideline (30 µg/L) in HW23. The next sampling event for HW23 is tentatively scheduled for the second quarter of CY 2013.

4.1.2 Comparison of Historical Ground-Water Data at the Latty Avenue Properties

Ground-water sampling has been conducted at the Latty Avenue Properties from CY 1984 to the present. The most comprehensive ground-water monitoring program, involving sampling from 18 monitoring wells, was conducted at the site in the summer of CY 1997. Results from subsequent sampling events were used to evaluate contaminant trends at the Latty Avenue Properties during the period from the first quarter of CY 1999 to the fourth quarter of CY 2012. Statistical analysis was used to assist with identifying trends for those contaminants that exceeded the ROD guidelines during CY 2012.

Statistical Method and Trend Analysis

Several statistical methods are available to evaluate contaminant trends in ground water. These include the Mann-Kendall trend test, the Wilcoxon rank sum (WRS) test, and the Seasonal Kendall test (USEPA 2000). The latter two tests are applicable to data that may or may not exhibit seasonal behavior, but generally require larger sample sizes than the Mann-Kendall trend test. The Mann-Kendall trend test was selected for this project because this test can be used with small sample sizes (as few as four data points) and because a seasonal variation in concentrations was not indicated by the time-versus-concentration plots at the NC Sites. The Mann-Kendall trend test is a non-parametric test and, as such, is not dependent upon assumptions of distribution, missing data, or irregularly-spaced monitoring periods. In addition, data reported as being less than the detection limit (DL) can be used (Gibbons 1994). The test can assess whether a time-ordered dataset exhibits an increasing or decreasing trend, within a predetermined level of significance. While the Mann-Kendall trend test can use as few as four data points, often this is not enough data to detect a trend. Therefore, the test was performed only at those monitoring stations at the NC Sites where data have been collected for at least six sampling events.

A customized Microsoft Excel spreadsheet was used to perform the Mann-Kendall trend test. The test involves listing the sampling results in chronological order and computing all differences that may be formed between current measurements and earlier measurements. The value of the test statistic (S) is the difference between the number of strictly positive differences and the number of strictly negative differences. If S is a large positive value, then there is evidence of an increasing trend in the data. If S is a large negative value, then there is evidence of a decreasing trend in the data. If there is no trend and all observations are independent, then all rank orderings of the annual statistics are equally likely (USEPA 2000). The results of the Mann-Kendall trend test are reported in terms of a p-value or Z-score, depending on sample size, N. If the sample size is ≤ 10, then the p-value is computed. If the p value ≤ 0.05, the test concludes that the trend is statistically significant. If the p value is >0.05, the test concludes there is no evidence of a significant trend. For dataset sizes larger than 10, the Z-score is compared to $\pm$ 1.65, which is the comparison level at a 95 percent confidence level. If the Z-score is greater than +1.65, the test concludes that a significant upward trend exists. If the Z-score is less than –1.65, the test concludes that a significant downward trend exists. For Z-scores between –1.65 and 1.65, there is no evidence of a significant trend.

The results of the Mann-Kendall trend test are less reliable for datasets containing a high number of non-detects, particularly if the DL changes over time. For that reason, for datasets where more than 50 percent of the time-series data are non-detect, the Mann-Kendall trend test was not conducted. There is no general consensus regarding the percentage of non-detects that can be handled by the Mann-Kendall trend test. However, because the Mann-Kendall trend test is a nonparametric test that uses relative magnitudes, not actual values, it is generally valid even in cases in which there are a large number of non-detects.

Only unfiltered data were used, and split sample and QC sample results were not included in the database for the Mann-Kendall trend test. The Mann-Kendall trend test is used to evaluate the radiological data and to determine trends without regard to isotopic analysis. In addition, for monitoring wells for which the Mann-Kendall trend test has indicated a trend (either upward or downward), another analysis is performed to determine whether the trend is due to inherent error associated with the analytical test method for each sample analysis. This methodology graphs the data and the associated error-bar for the specific constituent. Time-concentration plots for arsenic and molybdenum in HW22 and total U in HISS-01 are provided on Figures 4-3 and 4-4, respectively.

Results of Trend Analysis for Ground Water at the Latty Avenue Properties

For those stations at which an analyte exceeded the ROD guideline at least once during the year and for which sufficient historical data were available to evaluate trends (i.e., at least six samples), statistical trend analysis was conducted to assess whether concentrations of the analyte are increasing (upward trending) or decreasing (downward trending) over time. For the purposes of this trend analysis, a statistically significant trend in concentration is defined as a trend with a confidence level greater than 95 percent. The confidence level denotes the probability that the indicated trend is an actual trend in the data, rather than a result of the random nature of environmental data.

HZ-A Ground Water

The Mann-Kendall trend test was performed for those wells in which analytes exceeded the ROD guidelines at least once during CY 2012, for which sufficient data were available (i.e., at least six samples were collected during the period from the first quarter of CY 1999 to the fourth quarter of CY 2012), and at which the percentage of non-detect results is ≤50 percent. However, for HW22, the time period was limited to CY 2003 through CY 2012 in order to obtain a dataset for which less than 50 percent of the results were non-detect. Five COCs, (arsenic and molybdenum in HW22, and U-234, U-238, and total U in HISS-01) were above the ROD guidelines in HZ-A ground water at the Latty Avenue Properties during CY 2012.

Inorganics

Statistical trend analysis using the Mann-Kendall trend test was conducted to confirm whether concentrations of arsenic are increasing or decreasing over time in HW22. The arsenic concentration for the third-quarter CY 2012 sample from HW22 (119 µg/L) is above the ROD guideline for arsenic (2.4 µg/L). As shown in Table 4-3, the Mann-Kendall trend test result indicates an increasing trend in arsenic concentrations at HW22 for the period between January of 2003 and December of 2012. The time-versus-concentration plot for arsenic in HW22 is provided on Figure 4-3. As indicated on this figure, during the period between March of 2007 and August of 2009, concentrations of arsenic increased from non-detect levels to an average concentration of 116 µg/L. The increase in arsenic concentrations generally correlates with a decrease in the ORP values as measured in the field and plotted on the secondary axis of Figure 4-3. Redox conditions in this well (as reflected by the ORP values) changed from oxidizing (+95 to +262 millivolts [mV]) to reducing (–127 to –189 mV) during the period between March of 2007 and August of 2009. The ORP values suggest that the oxidation/reduction state is a controlling factor for arsenic mobility at HW22. A correlation between arsenic and iron concentrations in ground-water samples from this well supports this conclusion. There was an abrupt increase in iron concentrations from <100 µg/L in the 13 ground-water samples collected on or prior to March 2, 2007, to between 12,000 to 14,000 µg/L in the two post-March-2007 samples. (Laboratory analysis for iron was discontinued after CY 2009 because iron was not identified as a COC at the NC Sites). Based on the soil boring log for HW22, iron oxide nodules are present throughout HZ-A. Iron oxides will adsorb or desorb arsenic when redox conditions change. It is possible that remediation and restoration activities conducted in the vicinity of HW22 resulted in a decrease in surface water recharge (i.e., oxygenated water) to the area, which initiated localized reducing conditions. The reducing conditions may have subsequently led to desorbtion of iron and arsenic from the iron oxide nodules and the elevated levels of arsenic and iron detected in ground-water samples from HW22 after March of 2007. HW22 is located in Tract 3 of VP-40A East. Remediation of Tract 3 was initiated in November 20, 2008, and restoration activities were completed in April of 2009. This time period is consistent with the timing of the increase in arsenic and iron concentrations and the decrease in ORP values reported for the ground-water samples from HW22. The levels of arsenic in Coldwater Creek surface water and sediment are low and have not increased over the CY 2000 through CY 2012 period, indicating that the increase in arsenic concentration in this well is localized and is not significantly impacting Coldwater Creek.

Table 4-3. Results of Mann-Kendall Trend Test[a] for Analytes with Concentrations Above the ROD Guidelines at the Latty Avenue Properties During CY 2012

Analyte	Station	N[b]	Test Statistics[c]		Trend[d]
			S	Z	
Arsenic	HW22	12	40	2.79	Upward Trend
Molybdenum	HW22	12	31	2.15	Upward Trend[e]
Total U	HISS-01	29	114	2.12	Upward Trend

[a] One-tailed Mann-Kendall trend tests were performed at a UCL_{95}.
[b] N is the number of unfiltered ground-water sample results for a particular analyte at a well within a specified time period. With the exception of HW22, the time period is between January of 1999 and December of 2012. For HW22, the dataset was restricted to the period between January of 2003 and December of 2012 in order to meet the Mann-Kendall trend test requirement that the dataset have a detection frequency greater than 50 percent.
[c] Test Statistics: S – the S-Statistic; Z – Z-score, or normalized test statistic (for datasets having N>10).
[d] Trend: If N>10, the Z-score is compared to ±1.65 to determine trend significance.
[e] When the measurement error is taken into account, there does not appear to be a significant upward trend.

Additional statistical trend analysis was conducted to confirm whether concentrations of molybdenum are increasing or decreasing over time in HW22. The molybdenum concentration for the third quarter (6.7 µg/L) CY 2012 sample from HW22 was above the ROD guideline (3.4 µg/L). An increasing trend in molybdenum concentrations was observed for HW22 for the period between January of 2003 and December of 2012. Because the Mann-Kendall trend test does not consider the effects of measurement error and does not provide any information concerning the magnitude of the trend, a time-versus-concentration plot for molybdenum in HW22 (Figure 4-3) was used to evaluate these factors. The best-fit trend line based on the data scatter is also shown on the graph. When measurement error is taken into account, there is no trend in molybdenum concentrations at HW22. The graph also indicates that the molybdenum concentrations at HW22 during CY 2012 were not above the ROD guideline when associated measurement errors were taken into account.

Radionuclides

The time-versus-concentration plots shown on Figure 4-4 provide an overview of the temporal and spatial variability in the concentrations of total U in ground water at the Latty Avenue Properties. Total U concentrations were calculated using the isotopic U results in pCi/L and were converted to µg/L using radionuclide-specific activities. The reported values were used for detected and non-detected isotopic values, except in instances when the value was negative. If the reported value was negative, a value equal to zero was substituted for the result prior to calculating the total U concentration. Three radiological analytes, (U-234, U-238, and total U) were detected at concentrations above the ROD guidelines in HZ-A well HISS-01 at the Latty Avenue Properties during CY 2012. A trend analysis was performed for the total U concentrations for HISS-01. Because the total U values are calculated using the U-234 and U-238 values, the trends in their values should be the same as the total U trend results. Therefore, it was unnecessary to perform a separate trend analysis for each of these isotopes. As shown in Table 4-3, a statistically significant increasing trend in total U concentrations was identified for HISS-01 for the 1999 through 2012 dataset. Based on the time-versus-concentration plot for HISS-01 on Figure 4-4, the concentrations were relatively stable prior to 2009, and increased abruptly in February of 2009, possibly as a result of the RA conducted in adjacent areas during this period. Although an overall increasing trend was identified for the entire 1999 through 2012 period, a decreasing trend is observed when the dataset is restricted to the past 3 years. Concentrations of total U in HISS-01 have declined from a high of 337 µg/L on May 29, 2009, to 35.2 µg/L on August 21, 2012.

HZ-C Ground Water

The HZ-C well HW23 was not sampled during CY 2012. Therefore, trend analysis was not conducted for HZ-C ground water.

4.1.3 Evaluation of the Potentiometric Surface at the Latty Avenue Properties

Ground-water surface elevations were measured at the Latty Avenue Properties in February, May, August, and December of CY 2012. The potentiometric surface maps for HZ-A and HZ-C created from the May 24 and December 7, 2012, ground-water elevation measurements are provided on Figures 4-5, 4-6, 4-7, and 4-8. The ground-water surface elevations at the Latty Avenue Properties and the SLAPS and SLAPS VPs were mapped on the same figures because these areas are in the same ground-water flow regime.

The top of the saturated zone occurs in the low hydraulic conductivity silts and clays of stratigraphic Units 2 and 3T at the Latty Avenue Properties. The potentiometric data indicate near-radial potentiometric surface contour patterns for the HZ-A ground water at the HISS and Futura. Wells HISS-01, HISS-06A, HISS-10, HISS-17S, and HW22 have the highest potentiometric surface elevations, with lower ground-water elevations measured in the surrounding wells. At the western edge of the site, ground water in the HZ-A zone flows to the west toward Coldwater Creek. The local horizontal gradient for HZ-A ground water at the HISS and Futura ranged from 0.0103 ft/ft (May) to 0.0093 ft/ft (December) in CY 2012.

The potentiometric surface of the HZ-C ground water at the Latty Avenue Properties is not well defined due to the limited data available for the deeper HZs. Based on measured ground-water elevations in the HZ-C monitoring well HW23 at the Latty Avenue Properties and several HZ-C wells located to the southwest at the SLAPS and SLAPS VPs, the flow direction in the HZ-C ground water is generally toward the east or northeast. The local horizontal gradient for HZ-C ranged from 0.0036 ft/ft (December) to 0.0037 ft/ft (May) in CY 2012. This is a little higher than the gradient in CY 2011, which ranged from 0.0034 ft/ft (June) to 0.0036 ft/ft (November).

4.2 ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES

Ground-water monitoring wells have been installed at the SLAPS and SLAPS VPs to characterize the site stratigraphy, ground-water chemistry, and ground-water migration pathways.

Stratigraphy at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

In the vicinity of the SLAPS and the adjacent ballfields, surficial deposits (Unit 1) include topsoil and anthropogenic fill (rubble, scrap metal, gravel, glass, slag, and concrete) generally less than 14 ft thick (Figures 4-1, 4-9, and 4-10). Unit 2 is comprised of loess and has a thickness of 11 to 30 ft. Unit 3, which is subdivided into Subunits 3T, 3M, and 3B, consists primarily of clay and silt lakebed deposits. Each of these clayey subunits has a thickness of up to 30 ft. Unit 4 consists of clayey gravel with fine to very-fine sand and sandy gravel. This unit is interpreted to be approximately 5 to 15 ft thick and thins eastward and westward of the SLAPS. This unit is absent beneath the eastern part of the SLAPS, where the 3T, 3M, and 3B drape, or onlap, onto shale bedrock. Below Units 3 and 4 are Units 5 and 6, which consist of Pennsylvanian shale/siltstone and Mississippian limestone, respectively. Depth to bedrock ranges from approximately 55 ft on the eastern part of the SLAPS to a maximum of 90 ft toward Coldwater Creek to the west. The hydrogeologic and geologic setting at the SLAPS and SLAPS VPs is similar to that at the HISS, with one exception. The Pennsylvanian shale bedrock unit (Unit 5) present beneath portions of the SLAPS and SLAPS VPs is absent beneath the HISS.

Five HZs (HZ-A through HZ-E) are recognized beneath the SLAPS and SLAPS VPs. HZ-A consists of fill (Unit 1) and the Pleistocene, glacially related sediments of stratigraphic Unit 2, and Subunit 3T. Underlying HZ-A is HZ-B, which consists of highly impermeable clay (Subunit 3M). HZ-C consists of the stratigraphic Subunit 3B and Unit 4. The shale (Unit 5) and limestone (Unit 6) bedrock are recognized as HZ-D and HZ-E, respectively. HZ-E is the protected aquifer for the site.

The shallow (HZ-A) ground-water flow is toward Coldwater Creek under normal flow conditions. Average depths to the ground-water surface at the site range from near the ground surface during the spring months to approximately 10 ft below ground surface during the fall months. The dominant flow in HZ-A is through the more permeable Unit 2. Each of the subunits in Unit 3 has lower hydraulic conductivity than Units 1, 2, and 4. Units HZ-B and the Pennsylvanian shale, HZ-D, limit the passage of ground water vertically beneath the SLAPS and SLAPS VPs. Subunit 3M of HZ-B acts as a vertical barrier to ground-water movement under the western portion of the site. Subunit 3M is a clayey aquitard (unit resisting water passage) that effectively separates the HZ-A ground-water system from the underlying HZ-C and HZ-E. The dominant unit to obtain water in the lower horizon is the sandy, clayey gravel of Unit 4. Unit 4 of HZ-C is used as a surrogate for HZ-E, as water movement within the Mississippian limestone is dependent upon the limestone’s joint and solutioned system. In addition, the limestone has exhibited massive characteristics and is very slow to recharge.

Summary of CY 2012 Ground-Water Monitoring Results at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Four soil COCs (chromium at B53W06S, B53W09S and B53W13S; molybdenum at B53W13S and B53W18S; nickel at B53W13S; and total U at PW46) were above the ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2012. However, molybdenum at B53W13S did not exceed its ROD guideline if the associated measurement error is taken into account. Chromium concentrations in B53W09S and nickel concentrations at B53W13S were above the ROD guidelines for more than 12 months. A statistically significant increasing trend in chromium concentrations was observed for B53W06S, B53W09S, and B53W13S. In addition, a statistically significant increasing trend in nickel concentrations was observed for B53W13S. Total U concentrations were above the total U guideline of 30 μg/L in one HZ-A well (PW46) located at the SLAPS and have been above the guideline for a period of at least 12 months. However, based on trend analysis, concentrations of total U have not statistically increased in PW46.

Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2012. However, because nickel, chromium, and total U levels have been above the ROD guidelines for a period of at least 12 months, ground-water monitoring will continue subject to subsequent 5-year reviews.

No contaminants exceeded the ROD guideline in HZ-C through HZ-E ground water in CY 2012. Because no soil COCs have statistically increased in ground water (relative to the well's historical data and accounting for uncertainty) for more than a 12-month period, there is currently no finding of significantly degraded ground-water conditions in HZ-C through HZ-E ground water at the SLAPS and SLAPS VPs.

4.2.1 Evaluation of Ground-Water Monitoring Data at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The purpose of the ground-water monitoring conducted at the SLAPS and SLAPS VPs is specified in the ROD (USACE 2005). Response-action monitoring is currently being conducted in HZ-A and HZ-C to assess the improvement of water quality due to source removals and to document the protection of the limestone aquifer (HZ-E) during the RA.

As noted in Section 4.1.1, the ground-water monitoring data at the SLAPS and SLAPS VPs are evaluated against the requirements for ground-water monitoring identified in the ROD (USACE 2005).

In addition to the previously described monitoring, an evaluation of concentration trends is conducted for the COCs detected above ROD guidelines in ground water to support assessment of the effectiveness of the RA in the CERCLA 5-year reviews.

Monitoring Well Network at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The current EMP well network for the SLAPS and SLAPS VPs is shown on Figure 4-11. A summary of the HZ information for the ground-water monitoring wells located at the SLAPS and SLAPS VPs is provided in Table 4-4. HZ-A is considered the upper (or shallow) zone, while HZ-C, HZ-D, and HZ-E have been considered the lower (or deep) zone. This designation of upper and lower zones is separated at Subunit 3M of HZ-B. Fourteen wells are screened exclusively across the shallow zone (HZ-A). Four wells are screened exclusively in the lower zone across HZ-C, HZ-D, and/or HZ-E. The remaining well (PW36) is screened across both HZ-B and HZ-C.

Table 4-4. Ground-Water Monitoring Well Network at the SLAPS and SLAPS VPs During CY 2012

Well ID	Screened HZs			
	HZ-A	HZ-B	HZ-C	HZ-E
B53W01D[a]			X	
B53W01S[a]	X			
B53W06S[a]	X			
B53W07D			X	
B53W07S	X			
B53W09S[a]	X			
B53W13S[a]	X			
B53W17S	X			
B53W18S[a]	X			
B53W19S[a]	X			
MW31-98[a]	X			
MW32-98[a]	X			
PW35				X
PW36[a]		X	X	
PW42			X	
PW43[a]	X			
PW44	X			
PW45	X			
PW46[a]	X			

[a] Wells sampled in CY 2012

During CY 2012, 12 ground-water wells were sampled for various parameters at the SLAPS and SLAPS VPs. Ground-water samples collected from these wells were analyzed for both radiological and inorganic constituents. Historically, radiological parameters (Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238) and inorganic constituents have been the main focus of the ground-water sampling. In CY 2012, ground-water sampling was conducted on February 27 and March 1 (first quarter); May 29 and 30 (second quarter); August 20, 22, and 23 (third quarter); and December 11 (fourth quarter).

HZ-A Ground Water

Ten HZ-A wells were sampled at the SLAPS and the adjacent investigation areas during CY 2012 (B53W01S, B53W06S, B53W09S, B53W13S, B53W18S, B53W19S, MW31-98, MW32-98, PW43, and PW46). The analytical data for the CY 2012 ground-water sampling at the SLAPS and SLAPS VPs are provided in Table E-4 in Appendix E.

The CY 2012 results were compared to ROD guidelines for the soil COCs identified in the ROD (i.e., antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238). Table 4-5 lists those soil COCs exceeding the ROD guidelines in CY 2012 ground-water samples from HZ-A wells at the SLAPS and SLAPS VPs.

Table 4-5. Analytes Exceeding ROD Guidelines in HZ-A Ground Water at the SLAPS and SLAPS VPs During CY 2012

Analyte	Units	Station	ROD Guidelines[a]	Minimum Detected	Maximum Detected	Mean Detected	# Detects > ROD Guidelines[a]	Frequency of Detection
Chromium	µg/L	B53W06S	47	83	83	83	1	1/1
		B53W09S	9.6	34.4	34.4	34.4	1	1/1
		B53W13S	9.1	66	96	81	2	2/2
Molybdenum	µg/L	B53W13S	3.2	3.2[b]	3.5[b]	3.4[b]	1	2/2
		B53W18S	28	33.5	33.5	33.5	1	1/1
Nickel	µg/L	B53W13S	38	110	180	145	2	2/2
U-234	pCi/L	PW46	5,500	1,056[c]	1,056[c]	1,056[c]	0	1/1
U-235	pCi/L	PW46	290	61.3[c]	61.3[c]	61.3[c]	0	1/1
U-238	pCi/L	B53W19S	1.8	2.05[d]	2.05[d]	2.05[d]	1	1/1
		PW46	5,600	1,030[c]	1,030[c]	1,030[c]	0	1/1
Total U[e]	µg/L	PW46	30	3,103	3,103	3,103	1	1/1

[a] ROD Guidelines = Response-Action Monitoring Guideline and Total U Monitoring Guideline. Response-Action Monitoring Guideline = 2 x UCL_{95} (based on historical concentrations before RAs were initiated). Total U Monitoring Guideline = 30 µg/L (USACE 2005).
[b] Molybdenum at B53W13S did not exceed the ROD guideline if the associated measurement error (5 µg/L) is taken into account.
[c] The results for U-234, U-235, and U-238 do not exceed the ROD guidelines. The results are provided because they were used in the total U calculation.
[d] U-238 at B53W19S did not exceed the ROD guideline if the associated measurement error (0.7 pCi/L) is taken into account
[e] Total U values were calculated from isotopic concentrations in pCi/L and converted to µg/L using radionuclide specific activities using the following formula: total U (µg/L) = U-234(pCi/L)/6240 + U-235 (pCi/L)/2.16 + U-238 (pCi/L)/0.335.
Shaded cells represent results that do not exceed ROD guidelines.

Three inorganic soil COCs (chromium, molybdenum, and nickel) were detected in HZ-A ground water at concentrations above the ROD guidelines at the SLAPS and SLAPS VPs. Chromium was detected at concentrations above ROD guidelines in the fourth-quarter sample from B53W06S (83 µg/L) and the second- and fourth-quarter samples from B53W13S (96 µg/L and 66 µg/L, respectively). Chromium was not detected above the ROD guidelines in the prior CY 2011 samples from these two wells. Therefore, chromium concentrations in B53W06S and B53W13S did not exceed the ROD guidelines for more than 12 months. Additionally, chromium was detected at concentrations above the ROD guideline of 9.1 µg/L in the third-quarter CY 2012 sample (34.4 µg/L) from B53W09S. Chromium was also detected in B53W09S at concentrations above the ROD guideline in the third quarter sample of CY 2011 (17.5 µg/L). Therefore, chromium concentrations in B53W09S have exceeded the guideline for more than 12 months.

Molybdenum was detected in B53W13S at levels slightly above the ROD guideline of 3.2 µg/L in the fourth-quarter sample (3.5 µg/L). However, molybdenum concentrations are not above the ROD guideline in B53W13S if the associated measurement error is taken into account. The molybdenum concentration was not above the ROD guideline in the second-quarter sampling event and thus did not exceed the guideline for more than 12 months. Molybdenum was also detected at concentrations above the ROD guideline of 28 µg/L in the first-quarter sample from B53W18S. The molybdenum concentration was not above the ROD guideline in the fourth quarter of CY 2011 sampling event and thus did not exceed the guideline for more than 12 months.

Nickel was detected in B53W13S at concentrations above the ROD guideline during the second- and fourth-quarter sampling events in CY 2012. Nickel concentrations were also above the ROD guideline in all samples collected from B53W13S in CY 2011. Therefore, the nickel concentration at B53W13S has been above the ROD guideline for a period of at least 12 months.

In summary, comparison of the inorganic data to the ROD guidelines indicate that two inorganic soil COCs, chromium at B53W09S and nickel at B53W13S, had concentrations greater than their ROD guidelines for a period of at least 12 months. The surface-water and sediment data for Coldwater Creek indicate that concentrations of chromium and nickel are low and are not increasing over time.

One radiological soil COC (total U) exceeded the ROD guideline in HZ-A ground water at the SLAPS and SLAPS VPs. The total U concentration in PW46 (converted from pCi/L to µg/L using the isotopic concentrations and radionuclide-specific activities) exceeded the 30-µg/L guideline during the first-quarter CY 2012 sampling event. The total U concentration in PW46 was 3,103 µg/L on February 27, 2012. PW46 is an RA evaluation well that was installed at the western edge of the SLAPS in April of 2006. Although no ground-water sampling data are available for PW46 prior to May 18, 2006, data are available for the well previously at this location, PW38. The ROD guidelines for PW46 were developed using pre-2004 data from PW38. Based on the total U data collected in PW38 prior to its decommissioning in November of 2003, the CY 2012 total U concentration at PW46 is lower than the historical concentrations reported at PW38. Based on the statistical evaluation of trends presented in Section 4.2.2, no increases in the concentrations of total U have occurred in PW46 during CY 2012.

In summary, three inorganic soil COCs (chromium, molybdenum, and nickel) were above the ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2012 if the associated measurement errors are taken into account. Only two of these inorganic contaminants (chromium at B53W09S and nickel at B53W13S) have been above the ROD guidelines for a period of at least 12 months. Total U concentrations were above the total U guideline of 30 µg/L in one HZ-A well (PW46) located at the SLAPS and have been above the guideline for a period of at least 12 months. However, comparison of their CY 2012 concentrations with historical well data did not indicate that significant degradation of HZ-A ground water is occurring. Because a significant degrading of Coldwater Creek surface water has not occurred, there is currently no finding of significantly degraded ground-water conditions in HZ-A ground water at the SLAPS and SLAPS VPs in CY 2012. However, because chromium, nickel, and total U levels have been above the ROD guidelines for a period of at least 12 months, monitoring will continue subject to subsequent 5-year reviews.

Lower, HZ-C Through HZ-E, Ground Water

Two wells (B53W01D and PW36) screened across lower ground water (HZ-C through HZ-E) were sampled at the SLAPS and SLAPS VPs during CY 2012. Comparison of the data to the ROD guidelines indicates that no COCs were detected at levels above the ROD guidelines in HZ-C through HZ-E ground water. Therefore, the CY 2012 HZ-C through HZ-E ground-water data from the SLAPS and SLAPS VPs do not indicate that significant degradation of lower ground water is occurring.

4.2.2 Comparison of Historical Ground-Water Data at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Results of ground-water sampling conducted between CY 1998 though CY 2012 indicated that various inorganics and radionuclides have been detected above their ROD guidelines in HZ-A ground water at the SLAPS and SLAPS VPs. Statistical analysis was used to identify trends for those contaminants that exceeded these guidelines during CY 2012. The statistical method used to evaluate the trends, the Mann-Kendall trend test, is described in Section 4.1.2. Filtered data, split samples, and field duplicates were not included in the analysis. For datasets in which 50 percent or more of the time-series data are non-detect, the Mann-Kendall trend test was not performed.

Results of Trend Analysis at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

The evaluation of historical trends for ground water at the SLAPS and SLAPS VPs focuses on those contaminants that exceeded the ROD guidelines in samples collected during CY 2012. For those monitoring wells at which an analyte exceeded these guidelines in one or more samples during CY 2012 and the historical dataset had a detection frequency greater than 50 percent and a sample size of at least six, a statistical trend analysis was conducted to assess whether concentrations of the analyte are increasing (upward trending) or decreasing (downward trending) over time. For the purposes of this report, a statistically significant trend in concentration is defined as a trend with a confidence level greater than 95 percent. Because the Mann-Kendall trend test does not consider the effects of measurement error and does not provide any information concerning the magnitude of trends, time-concentration plots were used to evaluate these factors.

Based on the CY 2012 ground-water monitoring data for the SLAPS and SLAPS VPs, four soil COCs (chromium, molybdenum, nickel, and total U) exceeded their ROD guidelines in HZ-A ground water in CY 2012 if associated measurement errors are taken into account. To aid in the evaluation of trends, time-versus-concentration plots for chromium, molybdenum, nickel, and total U are provided on Figures 4-12 through 4-15. The Mann-Kendall trend test was performed for chromium in B53W06S, B53W09S, and B53W13S; molybdenum in B53W18S; nickel in B53W13S; and total U in PW46. Trend analysis was not performed for molybdenum in B53W13S or for U-238 in B53W19S, because they did not exceed their ROD guidelines if associated measurement errors are taken into account.

Trend analysis was not performed for deep (HZ-C through HZ-E) ground water because no COCs exceeded the ROD guidelines in deep ground water during CY 2012.

Inorganics

The Mann-Kendall trend test was performed for chromium (B53W06S, B53W09S, and B53W13S), molybdenum (B53W18S), and nickel (B53W13S). The results of the Mann-Kendall trend tests are provided in Table 4-6. As shown in Table 4-6, a statistically significant increasing trend in chromium concentrations (i.e., a trend with a confidence level greater than 95 percent) was observed for B53W06S, B53W09S, and B53W13S. In addition, a statistically significant increasing trend in nickel concentrations was observed for B53W13S. Because the Mann-Kendall trend test does not consider the effects of measurement error and does not provide any information concerning the magnitude of the trend, time-versus-concentration plots of chromium and nickel in B53W13S (Figure 4-12) and of chromium in B53W06S and B53W09S (Figure 4-13) were used to evaluate these factors. The best-fit trend lines based on the data scatter are also shown on the graphs on these figures.

Table 4-6. Results of Mann-Kendall Trend Test[a] for Analytes with Concentrations Above ROD Guidelines in Ground Water at the SLAPS and SLAPS VPs During CY 2012

Analyte	Station	N[b]	Test Statistics[c]		Trend[d]
			S	Z	
Chromium	B53W06S	13	38	2.26	Upward Trend
	B53W09S	15	53	2.63	Upward Trend
	B53W13S	20	140	4.53	Upward Trend
Molybdenum	B53W18S	14	23	1.24	No Trend
Nickel	B53W13S	20	103	3.33	Upward Trend
Total U	PW46	13	4	0.18	No Trend

[a] One-tailed Mann-Kendall trend tests were performed at a 95-percent level of confidence.
[b] N is the number of unfiltered ground-water sample results for a particular analyte for the period between January of 1999 and December of 2012 for B53W06S, B53W09S, B53W13S, and B53W18S and between May of 2006 and December of 2012 for PW46.
[c] Test Statistics: S – the S-Statistic; Z – Z-score, or normalized test statistic (used if N>10).
[d] Trend: If N>10, the Z-score is compared to ±1.64 to determine trend significance.

Radionuclides

A statistical evaluation of historical uranium concentrations has been conducted using total U concentrations. Total U values were calculated from isotopic concentrations in pCi/L and converted to µg/L using radionuclide-specific activities. Time-versus-concentration graphs for total U for some of the wells sampled in CY 2012 at the SLAPS and SLAPS VPs are provided on Figure 4-14. The Mann-Kendall trend test was performed for total U in the one HZ-A well (PW46) having levels above the 30-µg/L ROD guideline in CY 2012. The results of the Mann-Kendall trend test are provided in Table 4-6. The Mann-Kendall trend test results indicate no trend for total U in PW46. A graph of time-versus-total-U concentrations for PW46 is shown on Figure 4-15. PW46 was installed in April of 2006 near the former location of PW38 and is screened across the same interval. For comparison purposes, the PW38 data collected between March of 2000 and November of 2003 is also shown on the graph of PW46 data on Figure 4-15. As indicated on the graph, total U concentrations in PW46 have decreased from the levels reported at PW38 prior to installation of PW46.

4.2.3 Evaluation of Potentiometric Surface at the St. Louis Airport Site and St. Louis Airport Site Vicinity Properties

Ground-water surface elevations were measured from wells at the SLAPS and SLAPS VPs in February, May, August, and December of CY 2012. Ground-water elevation contours were drawn using the May 24, 2012, and December 7, 2012, measurements to provide a comparison of the ground-water flow conditions during periods of high and low ground-water elevations, respectively. The potentiometric surface maps, shown on Figures 4-5 through 4-8, were developed for both HZ-A and HZ-C ground-water zones. The ground-water flow direction is interpreted to be perpendicular to the ground-water equipotential contours.

In May and December of CY 2012, the ground-water flow direction in the HZ-A ground water at the SLAPS and adjacent SLAPS VP Ballfields was northwesterly toward Coldwater Creek (Figures 4-5 and 4-7). In the eastern portion of the SLAPS, the average horizontal hydraulic gradient ranges from 0.005 ft/ft (May 24, 2012) to 0.006 ft/ft (December 7, 2012). The hydraulic gradient increases near Coldwater Creek, where the average horizontal gradient ranges from 0.019 ft/ft (May 24, 2012) to 0.016 ft/ft (December 7, 2012). The unconfined HZ-A ground water is interpreted to discharge into Coldwater Creek, which divides the HZ-A ground-water system south and east of the creek from areas north and west of Coldwater Creek. Ground-water recharge comes from three primary sources: precipitation, off-site inflow of ground water, and creek bed infiltration during high creek stage. Ground-water discharge could occur by seepage into Coldwater Creek during low creek stage (DOE 1994). The vertical gradient varies beneath the site and is influenced by stratigraphic heterogeneity and seasonal fluctuations in recharge and evapotranspiration. Based on the CY 2012 water-level measurements, the position of the HZ-A ground-water surface averages approximately 3.4 ft higher in the corresponding shallow wells at the SLAPS and SLAPS VPs in the wet season (May) than in the dry season (December).

A review of the screened intervals in the deep wells indicates that many wells are screened across multiple lithologic units and HZs. Based on this review, the HZ-C (Units 3B and 4) potentiometric surface was determined to be a proper representation of the lower ground-water system. This review reduces the number of data points used to develop the potentiometric surface contours but results in a higher level of confidence in contouring the HZ-C potentiometric surface.

The potentiometric surface contours for the HZ-C ground water in CY 2012 are illustrated on Figures 4-6 and 4-8. The flow in HZ-C is generally east or northeast, at an average horizontal gradient of 0.0037 ft/ft in May of 2012 and 0.0036 ft/ft in December of 2012. A comparison of the ground-water elevations from monitoring well pairs indicates that the wells completed in HZ-A exhibit different hydraulic heads from the wells completed in HZ-C. Near Coldwater Creek, the potentiometric surface of the “confined” aquifer HZ-C (ranging in elevation between approximately 514 and 516 ft amsl) is higher than the potentiometric surface of the unconfined HZ-A zone, indicating an upward vertical gradient. The large difference in hydraulic head demonstrates that the HZ-A and HZ-C ground-water zones are distinct ground-water systems with limited hydraulic connection. This is supported by the lithologic data, which indicate that a highly impermeable clay (Subunit 3M of HZ-B) and silty clay (Subunit 3B of HZ-C) separates the HZ-A ground-water system from the underlying ground-water zones. The HZ-C potentiometric surfaces do not appear to be influenced by Coldwater Creek (the creek’s thalweg is about 500 ft amsl) or by seasonal changes. These features are likely a result of the overlying clay layers limiting vertical ground-water movement.

5.0 ENVIRONMENTAL QUALITY ASSURANCE PROGRAM

5.1 PROGRAM OVERVIEW

The environmental quality assurance (QA) program includes management of the QA/QC programs, plans, and procedures governing environmental monitoring activities at all SLS and at subcontracted vendor laboratories. This section discusses the environmental monitoring standards at the FUSRAP and the goals for these programs, plans, and procedures.

The environmental QA program provides FUSRAP with reliable, accurate, and precise monitoring data. The program furnishes guidance and directives to detect and prevent problems from the time a sample is collected until the associated data are evaluated. The MDNR conducted site visits to observe the environmental monitoring activities. USEPA and MDNR regulatory oversight of sampling activities provided an additional level of QA/QC.

Key elements in achieving the goals of this program are maintaining compliance with the QA program, personnel training, compliance assessments, use of QC samples, documentation of field activities and laboratory analyses, and a review of data documents for precision, accuracy, and completeness.

General objectives are as follows:

- To provide data of sufficient quality and quantity to support ongoing remedial efforts, aid in defining potential COCs, meet the requirements of the EMG and the SAG, and support the ROD (USACE 1999a, 2000, 2005).
- To provide data of sufficient quality to meet applicable State of Missouri and federal concerns (e.g., reporting requirements).
- To ensure samples were collected using approved techniques and are representative of existing site conditions.

5.2 QUALITY ASSURANCE PROGRAM PLAN

The Quality Assurance Program Plan (QAPP) for activities performed at the NC Sites is described within Section 3.0 of the SAG. The QAPP provides the organization, objectives, functional activities, and specific QA/QC activities associated with investigations and sampling activities at the NC Sites.

QA/QC procedures are performed in accordance with applicable professional technical standards, USEPA requirements, government regulations and guidelines, and specific project goals and requirements. The QAPP was prepared in accordance with USEPA and USACE guidance documents, including *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans* (USEPA 1991), *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (USEPA 1994), and *Requirements for the Preparation of Sampling and Analysis Plans* (USACE 2001).

5.3 SAMPLING AND ANALYSIS GUIDE

The SAG summarizes standard operating procedures (SOPs) and data quality requirements for collecting and analyzing environmental data. The SAG integrates protocols and methodologies identified under various USACE and regulatory guidance. It describes administrative procedures for managing environmental data and governs sampling plan preparation, data review, evaluation and validation, database administration, and data archiving. The structure for identified sampling/ monitoring was delineated through programmatic documents such as the EMG (USACE 1999a) for the NC Sites, which is an upper tier companion document to the SAG (USACE 2000). The EMICY12 document outlines the analyses to be performed at the NC Sites for various media (USACE 2011).

Flexibility to address non-periodic environmental sampling, such as specific studies regarding environmental impacts, well installations, and/or in-situ waste characterizations, was accomplished by the issuance of work descriptions. Environmental monitoring data obtained during these sampling activities were reported to USEPA Region VII on a quarterly basis per the requirements of the FFA.

5.4 FIELD SAMPLE COLLECTION AND MEASUREMENT

Prior to beginning field sampling, field personnel were trained, as necessary, and participated in a project-specific readiness review. These activities ensured that standard procedures were followed in sample collection and in completing field logbooks, chain-of-custody forms, labels, and custody seals. Documentation of training and readiness were submitted to the project file.

The master field investigation documents are the site field logbooks. The primary purpose of these documents is to record each day's field activities; personnel on each sampling team; and any administrative occurrences, conditions, or activities that may have affected the fieldwork or data quality of any environmental samples for any given day. Guidance for documenting specific types of field sampling activities in field logbooks or log sheets is provided in Appendix C of *Requirements for the Preparation of Sampling and Analysis Plans,* Engineer Manual (EM) 200-1-3 (USACE 2001).

At any point in the process of sample collection or data and document review, a non-conformance report may be initiated if non-conformances are identified (SAIC 2002). Data entered into the database may be flagged accordingly.

5.5 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits of both field and laboratory activities are conducted to verify that sampling and analysis activities were performed in accordance with the procedures established in the SAG and activity-specific work description or EMICY documents.

5.5.1 Field Assessments

Internal assessments (audit or surveillance) of field activities (sampling and measurements) are conducted by the QA/QC Officer (or designee). Assessments include an examination of field sampling records, field instrument operating records, sample collection, handling and packaging procedures, maintenance of QA procedures, and chain-of-custody forms. These assessments occurred at the onset of the project to verify that all established procedures were followed (systems audit).

Performance assessments followed the system audits to ensure that deficiencies had been corrected and to verify that QA practices/procedures were being maintained throughout the duration of the project. These assessments involved reviewing field measurement records, instrumentation calibration records, and sample documentation.

External assessments may be conducted at the discretion of the USACE, USEPA Region VII, or the State of Missouri.

5.5.2 Laboratory Audits

The onsite laboratories are subject to USACE periodic review(s) by the local USACE Chemist to demonstrate compliance with the *Department of Defense Quality Systems Manual (DOD QSM)* Version 4.2 (DOD 2010). In conjunction, blind third-party performance evaluation studies (performance audits) are participated in at least twice per year, and results are reported to the local USACE point(s) of contact. In addition, contract laboratories are required to be an accredited laboratory under the Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP). The DOD ELAP requires an annual audit and re-accreditation every 3 years.

These system audits include examining laboratory documentation of sample receipt, sample log-in, sample storage, chain-of-custody procedures, sample preparation and analysis, and instrument operating records. Performance audits consist of USACE laboratories receiving performance evaluation samples from an outside vendor for an ongoing assessment of laboratory precision and accuracy. The analytical results of the analysis of performance evaluation samples are evaluated by USACE Hazardous, Toxic, and Radioactive Waste – Center of Expertise and/or local oversight chemist to ensure that laboratories maintain acceptable performance.

Internal performance and system audits of laboratories were conducted by the Laboratory QA Manager as directed in the *Laboratory Quality Assurance Plan for the FUSRAP St. Louis Radiological Laboratory* (USACE 2013). These system audits included an examination of laboratory documentation of sample receipt, sample log-in, sample storage, chain-of-custody procedures, sample preparation and analysis, and instrument operating records against the requirements of the laboratory’s SOPs. Internal performance audits were also conducted on a regular basis. Single-blind performance samples were prepared and submitted along with project samples to the laboratory for analysis. The Laboratory QA Manager evaluated the analytical results of these single-blind performance samples to ensure that the laboratory maintained acceptable performance. Quarterly QA/QC reports are generated and provided to the local USACE authority; these reports document the ongoing QC elements and allow further monitoring of quality processes/status. Also, QA plans and methodology are to follow the guidance as presented in the *DOD QSM* (DOD 2010).

5.6 SUBCONTRACTED LABORATORY PROGRAMS

All samples collected during environmental monitoring activities were analyzed by USACE-approved laboratories. QA samples were collected for ground water and sediment, which were analyzed by the designated USACE QA laboratory. Each laboratory supporting this work maintained statements of qualifications including organizational structure, QA manual, and SOPs. Additionally, subcontracted laboratories were also required to be an accredited laboratory under the DOD ELAP.

Samples collected during these investigations were analyzed by USEPA SW-846 methods and other documented USEPA or nationally recognized methods. Laboratory SOPs are based on the methods as published by the USEPA in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846*, Third Edition (USEPA 1993).

5.7 QUALITY ASSURANCE AND QUALITY CONTROL SAMPLES

The QA and QC samples were analyzed for the purpose of assessing the quality of the sampling effort and the reported analytical data. The QA and QC samples include duplicate samples (–1) and split samples (–2). The equations utilized for accuracy and precision can be found in Section 5.9.

5.7.1 Duplicate Samples

These samples, which measure precision, were collected by the sampling teams and were submitted for analysis to the on-site laboratory or contract laboratories. The identity of duplicate samples is held blind to the analysts. The purpose of these samples is to provide activity-specific, field-originated information regarding the homogeneity of the sampled matrix and the consistency of the sampling effort. These samples were collected concurrently with the primary environmental samples and equally represent the medium at a given time and location. Duplicate samples were collected from each medium addressed by this project and were submitted to the contracted laboratories for analysis. One duplicate sample was collected for approximately every 20 field samples of each matrix and analyte across the SLS. Precision is measured by the relative percent difference (RPD) for radiological and non-radiological analyses or the normalized absolute difference (NAD) for radiological analyses.

The non-radiological analyses RPDs are presented in Tables 5-1 and 5-2. The radiological analyses RPDs and NADs are presented in Tables 5-3 through 5-5. See Section 5.9 for the evaluation process.

Table 5-1. Non-Radiological Duplicate Sample Analysis for CY 2012 – Surface and Ground Water

Sample Name	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD	RPD	RPD	RPD	RPD
CWC142855 / CWC142855-1	NC	0.00	4.51	NC	NC
CWC146282 / CWC146282-1	NC	8.70	2.45	NC	NC
HIS145172 / HIS145172-1	NC	NC	0.96	NC	NC
SLA142416 / SLA142416-1	NC	11.76	0.00	3.39	7.87
SLA143658 / SLA143658-1	NC	NC	2.41	NC	1.12
	Molybdenum	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD	**RPD**	**RPD**	**RPD**	**RPD**
CWC142855 / CWC142855-1	2.13	0.00	3.77	**66.67**	NC
CWC146282 / CWC146282-1	1.78	2.99	13.95	NC	NC
HIS145172 / HIS145172-1	0.00	7.41	10.26	**56.41**	NC
SLA142416 / SLA142416-1	2.71	0.13	**37.84**	NC	NC
SLA143658 / SLA143658-1	16.67	4.88	NC	28.57	NC

NC Not calculated due to one or both concentrations being below DLs.
-1 Sample Duplicate
Boldface Values exceed the control limits. Values not in boldface are within control limits.

Table 5-2. Non-Radiological Duplicate Sample Analysis for CY 2012 – Sediment

Sample Name	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD	RPD	RPD	RPD	RPD
CWC142856 / CWC142856-1	6.45	**30.09**	**35.38**	**48.57**	**34.20**
CWC146283 / CWC146283-1	NC	**48.04**	**74.69**	NC	13.43
	Molybdenum	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD	**RPD**	**RPD**	**RPD**	**RPD**
CWC142856 / CWC142856-1	NC	20.69	NC	NC	25.20
CWC146283 / CWC146283-1	NC	1.66	NC	NC	0.80

NC Not calculated due to one or both concentrations being below DLs.
-1 Sample Duplicate
Boldface Values exceed the control limits. Values not in boldface are within control limits.

Table 5-3. Radiological Duplicate Sample Analysis for CY 2012 – Surface and Ground Water

Sample Name	Radium-226		Radium-228		Thorium-228		Thorium-230	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
CWC142855 / CWC142855-1	NC	NA	*	*	NC	NA	NC	NA
CWC146282 / CWC146282-1	NC	NA	*	*	NC	NA	NC	NA
HIS145172 / HIS145172-1	NC	NA	*	*	NC	NA	30.29	0.28
SLA142416 / SLA142416-1	NC	NA	*	*	24.71	NA	NC	NA
SLA143658 / SLA143658-1	NC	NA	*	*	NC	NA	2.73	NA
	Thorium-232		**Uranium-234**		**Uranium-235**		**Uranium-238**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142855 / CWC142855-1	NC	NA	54.89	0.73	NC	NA	28.95	NA
CWC146282 / CWC146282-1	NC	NA	NC	NA	NC	NA	47.71	0.31
HIS145172 / HIS145172-1	NC	NA	7.19	NA	NC	NA	18.89	NA
SLA142416 / SLA142416-1	NC	NA	107.20	1.62	NC	NA	**131.18**	**2.01**
SLA143658 / SLA143658-1	NC	NA	30.91	0.28	NC	NA	NC	NA

NC Not calculated due to one or both concentrations being below DLs.
NA Not applicable; see RPD.
* Not calculated because either parent or split sample was not analyzed.
-1 Sample Duplicate
Boldface Values exceed the control limits. Values not in boldface are within control limits.

Table 5-4. Radiological Duplicate Sample Analysis for CY 2012 – Sediment

Sample Name	Thorium-228[a]		Thorium-230[a]		Thorium-232[a]	
	RPD	NAD	RPD	NAD	RPD	NAD
CWC142856 / CWC142856-1	5.37	NA	0.00	NA	42.98	0.57
CWC146283 / CWC146283-1	47.41	0.78	10.13	NA	60.78	0.86

NA Not applicable; see RPD.
-1 Sample Duplicate
[a] Results from alpha spectroscopy.

Table 5-5. Radiological Duplicate Sample Gamma Analysis for CY 2012 – Sediment

Sample Name	Actinium-227		Americium-241		Cesium-137		Potassium-40	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
CWC142856 / CWC142856-1	NC	NA	NC	NA	NC	NA	1.52	NA
CWC146283 / CWC146283-1	NC	NA	NC	NA	NC	NA	4.17	NA
	Protactinium-231		**Radium-226**		**Radium-228**		**Thorium-228**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142856 / CWC142856-1	NC	NA	11.67	NA	6.47	NA	6.47	NA
CWC146283 / CWC146283-1	NC	NA	1.98	NA	10.31	NA	10.31	NA
	Thorium-230		**Thorium-232**		**Uranium-235**		**Uranium-238**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142856 / CWC142856-1	NC	NA	6.47	NA	NC	NA	18.18	NA
CWC146283 / CWC146283-1	NC	NA	10.31	NA	NC	NA	0.71	NA

NC Not calculated due to one or both concentrations being below DLs
NA Not applicable; see RPD.
-1 Sample Duplicate

5.7.3 Split Samples

Split samples measure accuracy and were collected by the sampling team and sent to a USACE QA laboratory for analysis to provide an independent assessment of contractor and subcontractor laboratory performance. One split sample was collected for approximately every 20 field samples of each matrix for radiological analytes across the SLS.

The radiological analyses RPDs and NADs are presented in Tables 5-6 through 5-8. The non-radiological analysis RPDs are presented in Tables 5-9 and 5-10. The overall precision for the CY 2012 environmental monitoring sampling activities was acceptable. See Section 5.9 for the evaluation process.

Table 5-6. Non-Radiological Split Sample Analysis for CY 2012 – Surface and Ground Water

Sample Name	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD	RPD	RPD	RPD	RPD
CWC142855 / CWC142855-2	NC	10.53	0.00	8.00	NC
CWC146282 / CWC146282-2	NC	**31.58**	3.28	NC	NC
HIS145172 / HIS145172-2	NC	NC	5.61	**41.67**	NC
SLA142416 / SLA142416-2	NC	22.22	3.92	**30.99**	6.48
SLA143658 / SLA143658-2	NC	NC	12.93	**46.51**	3.28
	Molybdenum	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD	**RPD**	**RPD**	**RPD**	**RPD**
CWC142855 / CWC142855-2	3.17	**49.35**	0.00	NC	NC
CWC146282 / CWC146282-2	0.00	25.64	**93.33**	NC	NC
HIS145172 / HIS145172-2	**69.47**	**80.85**	7.06	**133.33**	NC
SLA142416 / SLA142416-2	4.86	2.50	**33.33**	**131.91**	NC
SLA143658 / SLA143658-2	**93.88**	**80.60**	NC	**144.50**	NC

NC Not calculated due to one or both concentrations being below DLs.
Boldface Values exceed the control limits. Values not in boldface are within control limits.
-2 Sample Split

Table 5-7. Non-Radiological Split Sample Analysis for CY 2012 – Sediment

Sample Name	Antimony	Arsenic	Barium	Cadmium	Chromium
	RPD	RPD	RPD	RPD	RPD
CWC142856 / CWC142856-2	28.57	**36.48**	**51.82**	23.35	10.08
CWC146283 / CWC146283-2	NC	**97.99**	24.56	NC	22.87
	Molybdenum	**Nickel**	**Selenium**	**Thallium**	**Vanadium**
	RPD	**RPD**	**RPD**	**RPD**	**RPD**
CWC142856 / CWC142856-2	NC	22.22	24.28	NC	**52.63**
CWC146283 / CWC146283-2	NC	5.16	NC	NC	0.00

NC Not calculated due to one or both concentrations being below DLs.
Boldface Values exceed the control limits. Values not in boldface are within control limits.
-2 Sample Split

Table 5-8. Radiological Split Sample Analysis for CY 2012 – Surface and Ground Water

Sample Name	Radium-226		Radium-228		Thorium-228		Thorium-230	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
CWC142855 / CWC142855-2	NC	NA	*	*	NC	NA	NC	NA
CWC146282 / CWC146282-2	NC	NA	*	*	NC	NA	NC	NA
HIS145172 / HIS145172-2	NC	NA	*	*	NC	NA	46.79	0.40
SLA142416 / SLA142416-2	NC	NA	*	*	NC	NA	NC	NA
SLA143658 / SLA143658-2	NC	NA	*	*	NC	NA	NC	NA
	Thorium-232		**Uranium-234**		**Uranium-235**		**Uranium-238**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142855 / CWC142855-2	NC	NA	16.17	NA	NC	NA	15.54	NA
CWC146282 / CWC146282-2	NC	NA	NC	NA	NC	NA	73.76	0.77
HIS145172 / HIS145172-2	NC	NA	53.63	0.90	NC	NA	13.07	NA
SLA142416 / SLA142416-2	NC	NA	100.00	1.69	NC	NA	**131.98**	**2.13**
SLA143658 / SLA143658-2	NC	NA	55.32	0.73	NC	NA	14.35	NA

NC Not calculated due to one or both concentrations being below DLs.
NA Not applicable; see RPD.
* Not calculated because either parent or split sample was not analyzed.
-2 Sample Split
Boldface Values exceed the control limits. Values not in boldface are within control limits.

Table 5-9. Radiological Split Sample Alpha Analysis for CY 2012 – Sediment

Sample Name	Thorium-228		Thorium-230		Thorium-232	
	RPD	NAD	RPD	NAD	RPD	NAD
CWC142856 / CWC142856-2	56.72	0.89	44.67	0.84	55.51	0.83
CWC146283 / CWC146283-2	14.58	NA	13.17	NA	34.23	0.61

NA Not applicable; see RPD.
-2 Sample Split

Table 5-10. Radiological Split Sample Gamma Analysis for CY 2012 – Sediment

Sample Name	Actinium-227		Americium-241		Cesium-137		Potassium-40	
	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
CWC142856 / CWC142856-2	NC	NA	NC	NA	NC	NA	10.00	NA
CWC146283 / CWC146283-2	NC	NA	NC	NA	NC	NA	12.62	NA
	Protactinium-231		**Radium-226**		**Radium-228**		**Thorium-228**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142856 / CWC142856-2	NC	NA	7.66	NA	33.10	1.27	*	*
CWC146283 / CWC146283-2	NC	NA	24.89	NA	26.14	NA	*	*
	Thorium-230		**Thorium-232**		**Uranium-235**		**Uranium-238**	
	RPD	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**	**RPD**	**NAD**
CWC142856 / CWC142856-2	*	*	33.10	1.27	NC	NA	NC	NA
CWC146283 / CWC146283-2	*	*	26.14	NA	NC	NA	NC	NA

NC Not calculated due to one or both concentrations being below DLs.
NA Not applicable; see RPD.
* Not calculated because either parent or split sample was not analyzed.
-2 Sample Split

5.7.5 Equipment Rinsate Blanks

Equipment rinsate blank samples are typically taken from the rinsate water collected from equipment decontamination activities. These samples consist of analyte-free water that has been rinsed over sampling equipment for the purposes of evaluating the effectiveness of equipment decontamination. Because all of the monitoring wells have dedicated sampling equipment, equipment rinsate blanks were not employed to assess the effectiveness of the decontamination process, because it does not apply.

Sediment samples from Coldwater Creek are collected from each station using a clean sampling spoon. These spoons are segregated after use and decontaminated at the SLAPS field trailer according to Field Technical Procedure 405, *Cleaning and Decontaminating Sample Containers and Sampling Equipment* (SAIC 2000). Because the process of collecting sediment is below the surface of the water, a rinsate blank would not represent the wetted surface of the sampling spoon at the time of sample collection and, therefore, would not apply. The Coldwater Creek surface water samples are collected using new nitrile gloves and new laboratory sample containers. Therefore, equipment rinsate blanks for these samples are also not required.

5.8 DATA REVIEW, EVALUATION, AND VALIDATION

All data packages received from the analytical laboratory were reviewed and either evaluated or validated by data management personnel. Data validation is the systematic process of ensuring that the precision and accuracy of the analytical data are adequate for their intended use. Validation was performed in accordance with USEPA regional or National Functional Guidelines or project-specific guidelines. General chemical data quality management guidance found in Engineer Regulation 1110-1-263 (USACE 1998c) was also used when planning for chemical data management and evaluation. Additional details of data review, evaluation, and validation are provided in the *FUSRAP Laboratory Data Management Process for the St. Louis Site* (USACE 1999b). Data assessment guidance, to determine the usability of data from hazardous, toxic, and radioactive waste projects, was provided in EM 200-1-6 (USACE 1997).

One hundred percent of the data generated from all analytical laboratories was independently reviewed and either evaluated or validated. The data review process documents the possible effects on the data that result from various QC failures; it does not determine data usability, nor does it include assignment of data qualifier flags. The data evaluation process uses the results of the data review to determine the usability of the data. The process of data evaluation summarizes the potential effects of QA/QC failures on the data, and the District Chemist or District Health Physicist assesses their impact on the attainment of the project-specific data quality objectives (DQOs). Consistent with the data quality requirements, as defined in the DQOs, approximately 10 percent of all project data was validated.

5.9 PRECISION, ACCURACY, REPRESENTATIVENESS, COMPARABILITY, COMPLETENESS, AND SENSITIVITY

The data evaluation process considers precision, accuracy, representativeness, completeness, comparability, and sensitivity. The following sub-sections will provide detail to the particular parameters and how the data were evaluated for each, with discussion and tables to present the associated data.

Accuracy and precision can be measured by the RPD or the NAD using the following equations:

$$RPD = \left(\frac{[S - D]}{\frac{S+D}{2}} \right) x\ 100$$

$$NAD = \frac{|S - D|}{\sqrt{U_S^2 + U_D^2}}$$

where:

S = Parent Sample Result
D = Duplicate/Split Sample Result
U_S = Parent Sample Uncertainty
U_D = Duplicate/Split Sample Uncertainty

The RPD is calculated for all samples for which a detectable result is reported for both the parent and the QA field split or field duplicate. For radiological samples, when the RPD is greater than 30 percent, the NAD is used to determine the accuracy or precision of the method. NAD accounts for uncertainty in the results; RPD does not. The NAD should be equal to or less than a value of 1.96. Neither equation is used when the analyte in one or both of the samples is not detected. In cases in which neither equation can be used, the comparison is counted as acceptable in the overall number of comparisons.

Precision is a measure of mutual agreement among individual measurements performed under the same laboratory controls. To evaluate for precision, a field duplicate is submitted to the same laboratory as the original sample to be analyzed under the same laboratory conditions.

The RPD and NAD between the two results was calculated and used as an indication of the precision of the analyses performed (Tables 5-3, 5-4, and 5-5). Sample collection precision was measured in the laboratory by the analyses of duplicates. With the exception of a few outliers, which were qualified accordingly, the overall precision for the CY 2012 environmental monitoring sampling activities was acceptable.

Accuracy provides a gauge or measure of the agreement between an observed result and the true value for an analysis. The RPD and NAD between the two results was calculated and used as an indication of the accuracy of the analyses performed (Tables 5-8, 5-9, and 5-10). For this report, accuracy is measured through the use of the field split samples through a comparison of the prime laboratory results versus the results of an independent laboratory.

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter that depends upon the proper design of the sampling program and proper laboratory protocols. Representativeness is satisfied through proper design of the sampling network, use of proper sampling techniques, following proper analytical procedures, and not exceeding holding times of the samples.

Representativeness was determined by assessing the combined aspects of the QA program, QC measures, and data evaluations. The network design was developed from the EMICY12; the sampling protocol from the SAG has been followed; and analytical procedures were conducted within the bounds of the QAPP. The overall representativeness of the CY 2012 environmental monitoring sampling activities was acceptable for the media and the media's sampling previously listed in this document.

Comparability expresses the confidence with which one data set can be compared with another. The extent to which analytical data will be comparable depends upon the similarity of sampling and analytical methods, as well as sample-to-sample and historical comparability. Standardized and consistent procedures used to obtain analytical data are expected to provide comparable results. These most recent (post CY 1997) analytical data, however, may not be directly comparable to data collected before CY 1997 because of differences in DQOs. Some media, such as storm water, and radiological monitoring have values that are primarily useful in the present and the comparison to historical data is not as relevant.

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions. It is expected that laboratories will provide data meeting QC acceptance criteria for all samples tested. For the CY 2012 environmental monitoring sampling activities, the data completeness was 100 percent (FUSRAP DQO for completeness is 90 percent).

Sensitivity is the determination of minimum detectable concentration (MDC) values that allows the investigation to assess the relative confidence that can be placed in a value in comparison to the magnitude or level of analyte concentration observed. For this report, MDC is a term generically used to represent both the method detection limit (MDL) for non-radiologicals and the minimum detectable activity (MDA) for radiological analytes. The closer a measured value comes to the MDC, the less confidence and more variation the measurement will have. Project sensitivity goals were expressed as quantitation level goals in the SAG. These levels were achieved or exceeded throughout the analytical process.

The MDC is reported for each result obtained by laboratory analysis. These very low MDCs are achieved through the use of gamma spectroscopy for all radionuclides of concern, with additional analyses from alpha spectroscopy for thorium, and inductively coupled plasma (ICP) for metals. Variations in MDCs for the same radiological analyte reflects variability in the detection efficiencies and conversion factors due to factors such as individual sample aliquot, sample density, and variations in analyte background radioactivity for gamma and alpha spec, at the laboratory. Variations in MDLs for the same non-radiological analyte reflect variability in calibrations between laboratories, dilutions, and analytical methods. In order to complete the data evaluation (i.e. precision, accuracy, representativeness, and comparability), analytical results that exceed the MDC of the analyte are desired.

5.10 DATA QUALITY ASSESSMENT SUMMARY

The overall quality of the data meets the established project objectives. Through proper implementation of the project data review, evaluation, validation, and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable, but estimated when necessary. Data that have been estimated have concentrations/activities that are below the quantitation limit or are indicative of accuracy, precision, or sensitivity being less than desired but adequate for interpretation.

These data can withstand scientific scrutiny, are appropriate for the intended purpose, and are technically defensible. The environmental information presented has an established confidence, which allows utilization for the project objectives and provides data for future needs.

5.11 RESULTS FOR PARENT SAMPLES AND THE ASSOCIATED DUPLICATE AND SPLIT SAMPLES

Summaries of the QA parent sample results and associated duplicate and/or split sample results are presented in Tables 5-11 through 5-14.

Table 5-11. Non-Radiological Parent Samples and Associated Duplicate and Split Samples (Surface and Ground Water) for CY 2012[a]

Sample Name[b]	Antimony			Arsenic			Barium			Cadmium			Chromium		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC142855	1.70	1.70	U	3.00	0.95	=	130.00	0.20	=	0.13	0.10	=	3.30	3.30	U
CWC142855-1	1.70	1.70	U	3.00	0.95	=	136.00	0.20	=	0.10	0.10	U	3.30	3.30	U
CWC142855-2	1.10	0.73	=	2.70	0.24	=	130.00	0.09	=	0.12	0.11	=	1.40	0.13	=
CWC146282	1.70	1.70	U	2.40	1.20	=	124.00	0.22	=	0.10	0.10	U	3.30	3.30	U
CWC146282-1	1.70	1.70	U	2.20	1.20	=	121.00	0.22	=	0.10	0.10	U	3.30	3.30	U
CWC146282-2	1.60	2.00	=	3.30	1.50	=	120.00	10.00	=	66.00	1.00	=	1.50	5.00	=
HIS145172	1.70	1.70	U	1.20	1.20	U	104.00	0.22	=	0.19	0.10	=	3.30	3.30	U
HIS145172-1	1.70	1.70	U	1.20	1.20	U	105.00	0.22	=	0.10	0.10	U	3.30	3.30	U
HIS145172-2	0.96	2.00	=	1.10	1.50	=	110.00	10.00	=	0.29	1.00	=	0.64	5.00	=
SLA142416	1.70	1.70	U	1.60	0.95	=	156.00	0.20	=	0.30	0.10	=	80.60	3.30	=
SLA142416-1	1.70	1.70	U	1.80	0.95	=	156.00	0.20	=	0.29	0.10	=	74.50	3.30	=
SLA142416-2	0.74	0.73	J	2.00	0.24	J	150.00	0.09	J	0.41	0.11	J	86.00	0.13	J
SLA143658	1.70	1.70	U	1.20	1.20	U	123.00	0.22	=	0.33	0.10	=	9.00	3.30	=
SLA143658-1	1.70	1.70	U	1.20	1.20	U	126.00	0.22	=	0.10	0.10	U	8.90	3.30	=
SLA143658-2	2.00	2.00	U	1.50	1.50	U	140.00	10.00	=	0.53	1.00	=	9.30	5.00	=
	Molybdenum			Nickel			Selenium			Thallium			Vanadium		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC142855	9.30	1.00	=	2.90	0.40	=	2.70	1.60	=	2.00	0.55	J	2.40	2.40	U
CWC142855-1	9.50	1.00	=	2.90	0.40	=	2.60	1.60	=	1.00	0.55	J	2.40	2.40	U
CWC142855-2	9.60	0.29	=	4.80	0.08	=	2.70	0.58	=	0.07	0.07	U	0.96	0.20	=
CWC146282	17.00	1.00	=	3.40	0.40	=	2.00	1.60	=	0.55	0.55	U	2.40	2.40	U
CWC146282-1	16.70	1.00	=	3.30	0.40	=	2.30	1.60	=	0.55	0.55	U	2.40	2.40	U
CWC146282-2	17.00	5.00	=	4.40	10.00	=	5.50	5.00	=	2.00	2.00	U	1.80	4.00	=
HIS145172	3.10	1.00	=	1.40	0.40	=	4.10	1.60	=	2.50	0.55	=	2.40	2.40	U
HIS145172-1	3.10	1.00	=	1.30	0.40	=	3.70	1.60	=	1.40	0.55	=	2.40	2.40	U
HIS145172-2	6.40	5.00	=	3.30	10.00	=	4.40	5.00	=	0.50	2.00	=	2.80	4.00	=
SLA142416	56.20	1.00	=	769.00	0.40	=	3.00	1.60	=	0.78	0.55	=	2.40	2.40	U
SLA142416-1	54.70	1.00	=	770.00	0.40	=	4.40	1.60	=	0.55	0.55	U	2.40	2.40	U
SLA142416-2	59.00	0.29	J	750.00	0.08	J	4.20	0.58	J	0.16	0.07	J	0.20	0.20	UJ
SLA143658	1.30	1.00	=	2.00	0.40	=	1.60	1.60	U	1.80	0.55	J	2.40	2.40	U
SLA143658-1	1.10	1.00	=	2.10	0.40	=	1.60	1.60	U	2.40	0.55	J	2.40	2.40	U
SLA143658-2	3.60	5.00	=	4.70	10.00	=	5.00	5.00	U	0.29	2.00	=	4.00	4.00	U

[a] Results are expressed in µg/L.
[b] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
Validation Qualifier (VQ) symbols indicate: "=" for positively identified results, "U" for not detected, "J" analyte was identified as estimated quantity, and "UJ" analyte was not detected and had QC deficiencies.

Table 5-12. Non-Radiological Parent Samples and Associated Duplicate and Split Samples (Sediment) for CY 2012[a]

Sample Name[b]	Antimony			Arsenic			Barium			Cadmium			Chromium		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC142856	1.60	1.20	J	6.50	0.61	=	153.00	0.48	J	0.87	0.19	=	22.60	0.60	=
CWC142856-1	1.50	1.10	J	4.80	0.56	=	107.00	0.45	J	0.53	0.18	=	16.00	0.55	=
CWC142856-2	1.20	0.11	=	9.40	0.07	=	260.00	0.08	=	1.10	0.06	=	25.00	0.14	=
CWC146283	9.20	9.20	U	11.10	4.50	=	125.00	3.60	=	1.40	1.40	U	15.10	4.40	J
CWC146283-1	8.70	8.70	U	6.80	4.30	=	274.00	3.40	=	1.40	1.40	U	13.20	4.20	J
CWC146283-2	0.32	0.30	=	3.80	0.39	=	160.00	0.39	=	0.70	0.26	=	19.00	2.60	=
	Molybdenum			Nickel			Selenium			Thallium			Vanadium		
	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ	Result	DL	VQ
CWC142856	1.90	1.90	U	17.60	0.44	=	0.97	0.97	=	2.90	2.90	U	21.00	2.40	=
CWC142856-1	1.80	1.80	U	14.30	0.40	=	0.89	0.89	U	2.70	2.70	U	16.30	2.20	=
CWC142856-2	1.50	0.45	=	22.00	0.24	=	0.76	0.26	=	0.49	0.09	=	36.00	0.09	=
CWC146283	14.40	14.40	U	17.90	3.20	=	7.20	7.20	U	21.70	21.70	U	25.00	18.10	=
CWC146283-1	13.60	13.60	U	18.20	3.10	=	6.80	6.80	U	20.50	20.50	U	24.80	17.10	=
CWC146283-2	0.77	2.60	=	17.00	2.60	=	0.84	1.30	=	0.24	0.39	=	25.00	1.00	=

[a] Results are expressed in µg/L.
[b] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, and "J" analyte was identified as estimated quantity.

Table 5-13. Radiological Parent Samples and Associated Duplicate and Split Samples (Surface and Ground Water) for CY 2012[a]

Sample Name[b]	Radium-226				Radium-228				Thorium-228				Thorium-230			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142855	1.51	1.26	1.59	U	*	*	*	*	0.65	0.47	0.22	J	0.65	0.47	0.22	J
CWC142855-1	0.29	1.13	2.47	UJ	*	*	*	*	0.30	0.43	0.73	UJ	0.55	0.51	0.60	U
CWC142855-2	0.19	0.09	0.10	=	*	*	*	*	0.16	0.22	0.33	UJ	0.00	0.14	0.37	UJ
CWC146282	0.42	0.59	0.57	UJ	*	*	*	*	0.38	0.35	0.46	U	0.22	0.30	0.53	UJ
CWC146282-1	0.00	0.77	1.96	UJ	*	*	*	*	0.27	0.28	0.36	UJ	0.54	0.40	0.44	J
CWC146282-2	0.21	0.11	0.13	J	*	*	*	*	-0.26	0.22	1.50	UJ	0.66	0.82	1.00	UJ
HIS145172	1.39	1.05	0.54	J	*	*	*	*	0.03	0.29	0.70	UJ	0.45	0.38	0.42	J
HIS145172-1	0.00	0.00	0.62	U	*	*	*	*	0.34	0.31	0.18	J	0.61	0.42	0.18	J
HIS145172-2	0.17	0.14	0.20	U	*	*	*	*	0.06	0.17	0.34	UJ	0.28	**0.20**	0.18	J
SLA142416	-0.11	0.59	1.88	UJ	*	*	*	*	0.46	0.38	0.21	J	0.58	0.45	0.46	J
SLA142416-1	-0.21	0.29	1.52	UJ	*	*	*	*	0.59	0.41	0.37	J	0.22	0.26	0.37	UJ
SLA142416-2	0.39	0.16	0.15	=	*	*	*	*	0.05	0.08	0.13	UJ	0.05	0.09	0.17	UJ
SLA143658	0.35	0.90	1.95	UJ	*	*	*	*	0.12	0.22	0.44	UJ	0.83	0.48	0.44	J
SLA143658-1	0.10	0.67	1.69	UJ	*	*	*	*	0.38	0.35	0.41	U	0.85	0.51	0.41	J
SLA143658-2	0.08	0.10	0.16	UJ	*	*	*	*	0.14	0.15	0.23	UJ	0.11	0.11	0.14	U
	Thorium-232				Uranium-234				Uranium-235				Uranium-238			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142855	0.04	0.18	0.49	UJ	1.27	0.61	0.17	=	-0.04	0.08	0.47	UJ	1.04	0.55	0.38	J
CWC142855-1	-0.05	0.10	0.60	UJ	0.72	0.44	0.35	J	-0.07	0.10	0.53	UJ	0.78	0.47	0.48	J
CWC142855-2	0.05	0.14	0.29	UJ	1.08	0.35	0.14	=	0.13	0.13	0.09	J	0.89	0.32	0.15	=
CWC146282	0.00	0.00	0.17	U	0.58	0.50	0.61	U	-0.05	0.10	0.62	UJ	0.25	0.29	0.23	J
CWC146282-1	0.12	0.17	0.16	UJ	0.15	0.40	0.86	UJ	0.13	0.25	0.34	UJ	0.41	0.42	0.28	J
CWC146282-2	0.00	0.09	0.63	UJ	0.59	0.26	0.13	=	0.06	0.09	0.14	UJ	0.54	0.24	0.11	=
HIS145172	0.14	0.20	0.19	UJ	2.01	0.88	0.20	J	0.05	0.21	0.55	UJ	1.63	0.77	0.20	=
HIS145172-1	0.07	0.14	0.18	UJ	2.16	1.00	0.24	J	0.11	0.22	0.30	UJ	1.97	0.94	0.24	=
HIS145172-2	-0.02	0.02	0.18	UJ	1.16	0.36	0.16	=	0.15	0.14	0.08	J	1.43	0.40	0.07	=
SLA142416	0.04	0.17	0.46	UJ	1.92	0.72	0.33	=	-0.03	0.07	0.40	UJ	2.05	0.74	0.15	=
SLA142416-1	0.12	0.18	0.17	UJ	0.58	0.40	0.37	J	0.08	0.15	0.20	UJ	0.43	0.33	0.17	J
SLA142416-2	0.01	0.05	0.11	UJ	0.64	0.24	0.12	=	0.00	0.01	0.07	UJ	0.42	0.19	0.09	=
SLA143658	0.00	0.00	0.16	U	0.48	0.40	0.44	J	0.09	0.18	0.25	UJ	0.51	0.40	0.20	J
SLA143658-1	0.07	0.14	0.19	UJ	0.65	0.48	0.46	J	-0.14	0.17	0.79	UJ	0.42	0.39	0.46	U
SLA143658-2	0.01	0.05	0.11	UJ	0.84	0.29	0.17	=	0.10	0.11	0.12	UJ	0.59	0.24	0.14	=

[a] Results are expressed in pCi/L. Negative results are less than the laboratory system's background level.
[b] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
* Not available because sample was not analyzed.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" analyte was identified as estimated quantity, and "UJ" analyte was not detected and had QC deficiencies.

Table 5-14. Radiological Parent Samples and Associated Duplicate and Split Samples (Sediment) for CY 2012[a]

Sample Name[b]	Thorium-228[c]				Thorium-230[c]				Thorium-232[c]			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142856	1.72	0.82	0.46	=	2.41	1.01	0.46	J	1.45	0.73	0.21	J
CWC142856-1	1.63	0.71	0.16	=	2.41	0.90	0.31	J	0.94	0.52	0.36	J
CWC142856-2	0.96	0.22	0.10	=	1.53	0.28	0.07	=	0.82	0.20	0.06	=
CWC146283	1.03	0.51	0.28	=	1.78	0.71	0.33	J	1.30	0.59	0.28	=
CWC146283-1	1.67	0.65	0.25	=	1.97	0.71	0.25	J	0.69	0.39	0.13	J
CWC146283-2	0.89	0.21	0.08	=	1.56	0.29	0.08	=	0.92	0.21	0.05	=
	Actinium-227				Americium-241				Cesium-137			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142856	0.08	0.21	0.34	UJ	0.04	0.07	0.11	UJ	0.04	0.02	0.04	UJ
CWC142856-1	-0.09	0.17	0.26	UJ	0.01	0.06	0.09	UJ	0.02	0.03	0.03	UJ
CWC142856-2	0.09	0.24	1.90	UJ	0.00	0.16	0.27	UJ	-0.01	0.06	0.10	UJ
CWC146283	0.01	0.14	0.24	UJ	0.03	0.03	0.05	UJ	-0.01	0.02	0.03	UJ
CWC146283-1	-0.02	0.10	0.15	UJ	0.03	0.02	0.04	UJ	0.02	0.01	0.01	J
CWC146283-2	0.27	0.26	0.42	U	0.06	0.18	0.30	UJ	-0.01	0.32	0.12	UJ
	Potassium-40				Protactinium-231				Radium-226			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142856	13.30	1.40	0.27	=	0.10	0.58	0.84	UJ	1.13	0.33	0.07	=
CWC142856-1	13.10	1.24	0.17	=	0.11	0.48	0.71	UJ	1.27	0.35	0.06	=
CWC142856-2	14.70	2.50	0.90	=	0.84	0.81	2.70	U	1.22	0.26	0.17	=
CWC146283	14.10	1.13	0.24	=	0.25	0.47	0.71	UJ	1.02	0.28	0.07	=
CWC146283-1	14.70	1.17	0.11	=	0.01	0.30	0.43	UJ	1.00	0.26	0.04	=
CWC146283-2	16.00	2.70	0.80	=	0.00	1.20	2.10	UJ	1.31	0.25	0.10	=
	Radium-228				Thorium-228				Thorium-230			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142856	0.85	0.09	0.07	=	0.85	0.09	0.07	=	1.76	5.08	8.81	UJ
CWC142856-1	0.91	0.08	0.08	=	0.91	0.08	0.08	=	-2.09	4.55	7.61	UJ
CWC142856-2	1.19	0.25	0.18	=	*	*	*	*	*	*	*	*
CWC146283	0.94	0.08	0.08	=	0.94	0.08	0.08	=	2.65	3.94	4.66	UJ
CWC146283-1	0.85	0.06	0.04	=	0.85	0.06	0.04	=	0.68	2.05	3.57	UJ
CWC146283-2	1.22	0.29	0.13	=	*	*	*	*	*	*	*	*
	Thorium-232				Uranium-235				Uranium-238			
	Result	Error	MDC	VQ	Result	Error	MDC	VQ	Result	Error	MDC	VQ
CWC142856	0.85	0.09	0.07	=	0.20	0.24	0.41	UJ	1.32	1.09	0.95	J
CWC142856-1	0.91	0.08	0.08	=	0.10	0.21	0.34	UJ	1.10	1.01	0.80	J
CWC142856-2	1.19	0.25	0.18	=	0.08	0.23	0.63	UJ	1.30	1.60	2.70	UJ
CWC146283	0.94	0.08	0.08	=	-0.02	0.20	0.31	UJ	0.99	0.47	0.45	=
CWC146283-1	0.85	0.06	0.04	=	-0.08	0.12	0.20	UJ	0.98	0.41	0.33	=
CWC146283-2	1.22	0.29	0.13	=	0.15	0.35	0.60	UJ	2.60	2.30	2.70	U

[a] Results are expressed in pCi/g. Negative results are less than the laboratory system's background level.
[b] Samples ending in "-1" are duplicate samples. Samples ending in "-2" are split samples.
[c] Results from alpha spectroscopy.
* Not available because sample was not analyzed.
VQ symbols indicate: "=" for positively identified results, "U" for not detected, "J" analyte was identified as estimated quantity, and "UJ" analyte was not detected and had QC deficiencies.

6.0 RADIOLOGICAL DOSE ASSESSMENT

This section evaluates the cumulative dose to a hypothetically impacted individual from exposure to radiological contaminants at the NC Sites and documents dose trends. The regulatory dose limit for members of the public is 100 mrem/yr, as stated in 10 *CFR* 20.1301. Although 10 *CFR* 20.1301 is not an ARAR for the NC Sites, the USACE has provided this evaluation to assess public exposures from FUSRAP cleanup operations. Compliance with the dose limit in §20.1301 can be demonstrated in one of the two following ways [§20.1302(b)(1) and (2)]:

1. Demonstrating by measurement or calculation that the TEDE to the individual likely to receive the highest dose from NC Sites FUSRAP cleanup operations does not exceed the annual dose limit (i.e., 100 mrem/yr); or
2. Demonstrating that: (*i*) the annual average concentration of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area does not exceed the values specified in Table 2 of Appendix B to Part 20; and (*ii*) if an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 2 millirem (mrem) per hour.

The USACE has elected to demonstrate compliance by calculation of the TEDE to a hypothetical individual likely to receive the highest dose from NC Sites operations (method 1 above). This section describes the methodology employed for this evaluation.

Dose calculations are presented for hypothetical maximally exposed individuals at the SLAPS and SLAPS VPs and Coldwater Creek. The monitoring data used in the dose calculations are reported in the respective environmental monitoring sections of this report.

Dose calculations related to airborne emissions, as required by 40 *CFR* 61, Subpart I (*National Emission Standards for Emissions of Radionuclides Other Than Radon From Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered By Subpart H),* are presented in Appendix A (the NC Sites FUSRAP CY 2012 Radionuclide Emissions NESHAP Report).

6.1 SUMMARY OF ASSESSMENT RESULTS AND DOSE TRENDS

- No excavation or loadout activities occurred on Latty Avenue Properties, and soil cleanup activities on the most contaminated Latty Avenue Properties, HISS and Futura, were completed in CY 2011. Additionally, the TEDE from Latty Avenue Properties to a hypothetical maximally exposed receptor was indistinguishable from background radiation dose after the cleanup concluded on Latty Avenue Properties. Therefore, calculation of TEDE from Latty Avenue Properties to a hypothetical maximally exposed receptor will not be included in the current and future reports unless excavation or loadout activities occur on those properties.
- The TEDE from the SLAPS and SLAPS VPs to a hypothetical maximally exposed individual from all complete/applicable pathways combined was <0.1 mrem/yr, estimated for an individual who works full time at a location approximately 500 meters (m) west-southwest from the center of the SLAPS Loadout area.
- The TEDE from Coldwater Creek to a hypothetical, maximally exposed individual from all complete/applicable pathways combined was 0.2 mrem/yr, estimated for a youth spending time as a recreational user of Coldwater Creek.

Annual dose trends from CY 2000 to CY 2012 at applicable NC Sites are documented on Figure 6-1. A comparison of the maximum annual dose from CY 2000 to CY 2012 at each of the applicable NC Sites to the annual average natural background dose of approximately 300 mrem/yr is provided on Figure 6-2.

6.2 PATHWAY ANALYSIS

The six complete pathways for exposure from radiological contaminants evaluated by the St. Louis FUSRAP EMP are listed in Table 6-1. These pathways are used to identify data gaps in the EMP and to estimate potential radiological exposures from the site. Of the six complete pathways, four were applicable in CY 2012 and were thus incorporated into radiological dose estimates.

Table 6-1. Complete Radiological Exposure Pathways for the NC Sites

Exposure Pathway	Pathway Description	Applicable to CY 2012 Dose Estimate	
		SLAPS	Coldwater Creek
Liquid A	Ingestion of ground water from local wells down-gradient from the site.	N	N
Liquid B	Ingestion of fish inhabiting Coldwater Creek.	NC	N
Liquid C	Ingestion of surface water[a] and sediments.	NC	Y[b]
Airborne A	Inhalation of particulates dispersed through wind erosion and RAs.	Y	NC
Airborne B	Inhalation of Rn-222 and decay products emitted from contaminated soils/wastes.	Y	NC
External	Direct gamma radiation from contaminated soils/wastes.	Y	N

a Surface water includes storm-water run-off from NC Sites, MSD discharges, and the water in Coldwater Creek.
b The pathway is only applicable to a recreational receptor (youth) exposed to contaminants present in Coldwater Creek water and sediments. Data from NC Sites storm-water discharges and MSD discharges are not applicable to the hypothesized recreational receptor; therefore, that data is not evaluated in this section.
NC Not a complete pathway for the respective site.
N Not applicable for the site.
Y Applicable for the site.

In developing specific elements of the St. Louis FUSRAP EMP, potential exposure pathways of the radioactive materials present on-site are reviewed to determine which pathways are complete. Evaluation of each exposure pathway is based on hypothesized sources, release mechanisms, types, probable environmental fates of contaminants, and the locations and activities of potential receptors. Pathways are then reviewed to determine whether a link exists between one or more radiological contaminant sources, or between one or more environmental transport processes, to an exposure point where human receptors are present. If it is determined that a link exists, the pathway is termed complete. Each complete pathway is reviewed to determine whether a potential for exposure was present during CY 2012. If a potential exposure was determined to be possible, the pathway is termed applicable. Only applicable pathways are considered in estimates of dose.

The pathways that are applicable to the CY 2012 dose estimates for NC Sites, including Coldwater Creek, are shown in Table 6-1. The pathways that are not complete were not considered in the dose assessment and are only listed in Table 6-1 because they were complete for at least one receptor location. The pathways listed as not applicable were listed as such in CY 2012 for the following reasons:

- Liquid A is not applicable because the aquifer is of naturally low quality, and it is not known to be used for any domestic purpose in the vicinity of the NC Sites (DOE 1994).
- Liquid B is not applicable at Coldwater Creek or for the SLAPS transient receptor, because it is unlikely that a game fish would be caught and eaten by the receptor. A survey was conducted, and 97 percent of the fish collected at Coldwater Creek during the survey (Parker and Szlemp 1987) were fathead minnows.
- The dose equivalent from Coldwater Creek to the receptor from contaminants in the water/sediment was estimated by using the Microshield Version 5.03 computer-modeling program. The scenario used was a youth playing in the creek bed (1 ft of water shielding and dry) for 52 hours per year. The highest estimated whole body dose to the youth was 0.3 microrem per year. Therefore, the external gamma pathway (from contaminants in the creek water/sediment) is not applicable for the Coldwater Creek receptor, because the gamma dose rate emitted from the contaminants is indistinguishable from background gamma radiation.

6.3 EXPOSURE SCENARIOS

Dose calculations were performed for maximally exposed individuals at critical receptor locations for applicable exposure pathways (see Table 6-1) to assess dose due to radiological releases from the NC Sites. First, conditions were set to determine the TEDE to a maximally exposed individual at each of the main site locations where excavation and loadout activities occurred (SLAPS and SLAPS VPs). A second dose equivalent for Coldwater Creek was calculated. A third set of dose equivalent calculations was performed to meet NESHAP requirements (Appendix A). These were also used for purposes of TEDE calculation.

The scenarios and models used to evaluate these radiological exposures are conservative but appropriate. Although radiation doses can be calculated or measured for individuals, it is not appropriate to predict the health risk to a single individual using the methods prescribed here. Dose equivalents to a single individual are estimated by hypothesizing a maximally exposed individual and placing this individual in a reasonable but conservative scenario. This method is acceptable when the magnitude of the dose to a hypothetical maximally exposed individual is small, as is the case for the NC Sites. This methodology provides for reasonable estimates of potential exposure to the public and maintains a conservative approach. The scenarios and resulting estimated doses are outlined in Section 6.4.

All ingestion calculations were performed using the methodology described in International Commission on Radiation Protection Reports 26 and 30 for a 50-year committed effective dose equivalent (CEDE). Fifty-year CEDE conversion factors were obtained from the USEPA *Federal Guidance Report,* No. 11 (USEPA 1989b).

6.4 DETERMINATION OF TOTAL EFFECTIVE DOSE EQUIVALENT FOR EXPOSURE SCENARIOS

TEDE for the exposure scenarios were calculated using CY 2012 monitoring data. Calculations for dose scenarios are provided in Appendix G. Dose equivalent estimates are well below the standards set by the NRC for annual public exposure and USEPA NESHAP limits.

The CY 2012 TEDEs for hypothetical maximally exposed individuals near the SLAPS and SLAPS VPs and Coldwater Creek are <0.1 mrem/yr and 0.2 mrem/yr, respectively. In comparison, the annual average exposure to natural background radiation in the United States results in a TEDE of approximately 300 mrem/yr (NCRP 2009). Assumptions are detailed in the following sections.

6.4.1 Radiation Dose Equivalent from Latty Avenue Properties to a Maximally Exposed Individual

There were no excavation or loadout activities in the Latty Avenue Properties during CY 2012; therefore, dose from the Latty Avenue properties is considered negligible (SAIC 2013b).

6.4.2 Radiation Dose Equivalent from St. Louis Airport Site/St. Louis Airport Site Vicinity Properties to a Maximally Exposed Individual

The SLAPS and SLAPS VPs contributing to dose (i.e., those properties at which RA occurred in CY 2012) include: Ballfields, Eva Loadout, and the SLAPS Loadout. This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to frequent the perimeter of the SLAPS and SLAPS VPs and to receive a radiation dose by the exposure pathways identified previously. No private residences are adjacent to the site. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A full-time-employee business receptor was considered to be the maximally exposed individual from the SLAPS and SLAPS VPs.

The exposure scenario assumptions follow.

- Exposure to radiation from all SLAPS sources occurs to the maximally exposed individual while working full time outside at the receptor location facility located approximately 500 m west-southwest from the center of the SLAPS Loadout area. Exposure time is 2,000 hours per year (SAIC 2013c).
- Exposure from external gamma radiation was calculated using environmental TLD monitoring data at the perimeter between the source and the receptor. The site is assumed to represent a line-source to the receptor.
- Exposure from airborne radioactive particulates was calculated by using soil concentration data and air particulate monitoring data to determine a source term and then running the CAP-88 PC modeling code to calculate dose to the receptor (SAIC 2013c).
- Exposure from Rn-222 (and progeny) was calculated using a dispersion factor and Rn-222 (alpha track) monitoring data at the site perimeter between the source and the receptor (SAIC 2013c).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual working outside at the receptor facility 500 m west-southwest of the center of the SLAPS Loadout area received less than 0.1 mrem/yr from external gamma, less than 0.1 mrem/yr from airborne radioactive particulates, and less than 0.1 mrem/yr from Rn-222 for a TEDE of less than 0.1 mrem/yr (SAIC 2013c).

6.4.3 Radiation Dose Equivalent from Coldwater Creek to a Maximally Exposed Individual

This section discusses the estimated TEDE to a hypothetical maximally exposed individual assumed to frequent Coldwater Creek and receive a radiation dose by the exposure pathways identified previously. The assumed scenario is for a recreational user. Therefore, all calculations of dose equivalent due to the applicable pathway assume a realistic residence time that is less than 100 percent. A youth spending time as a recreational user of Coldwater Creek is considered to be the maximally exposed individual from Coldwater Creek.

The exposure scenario assumptions follow.

- The youth spends 2 hours at Coldwater Creek during each visit, and visits once every 2 weeks. It is likely that this activity would be greater in summer and less in winter, but the yearly average is 26 visits.
- The soil/sediment ingestion rate is 50 milligrams (mg) per day, and water ingestion rate is two liters (L) per day (USEPA 1989c).
- The UCL_{95} of the mean radionuclide concentrations in Coldwater Creek surface water/sediment samples collected in CY 2012 were assumed to be present in the water/sediment ingested by the maximally exposed individual (SAIC 2013d).
- Dose equivalent conversion factors for ingestion are: Total U, 2.50E-5 millirem per picocurie (mrem/pCi); Ra-226, 1.33E-3 mrem/pCi; Ra-228, 1.44E-3 mrem/pCi; Th-228, 3.96E-4 mrem/pCi; Th-230, 5.48E-4 mrem/pCi; and Th-232, 2.73E-3 mrem/pCi (USEPA 1989b).

Based on the exposure scenario and assumptions described previously, a maximally exposed individual using Coldwater Creek for recreational purposes received less than 0.1 mrem/yr from soil/sediment ingestion and 0.2 mrem/yr from water ingestion, for a TEDE of 0.2 mrem/yr (SAIC 2013d).

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FIGURES

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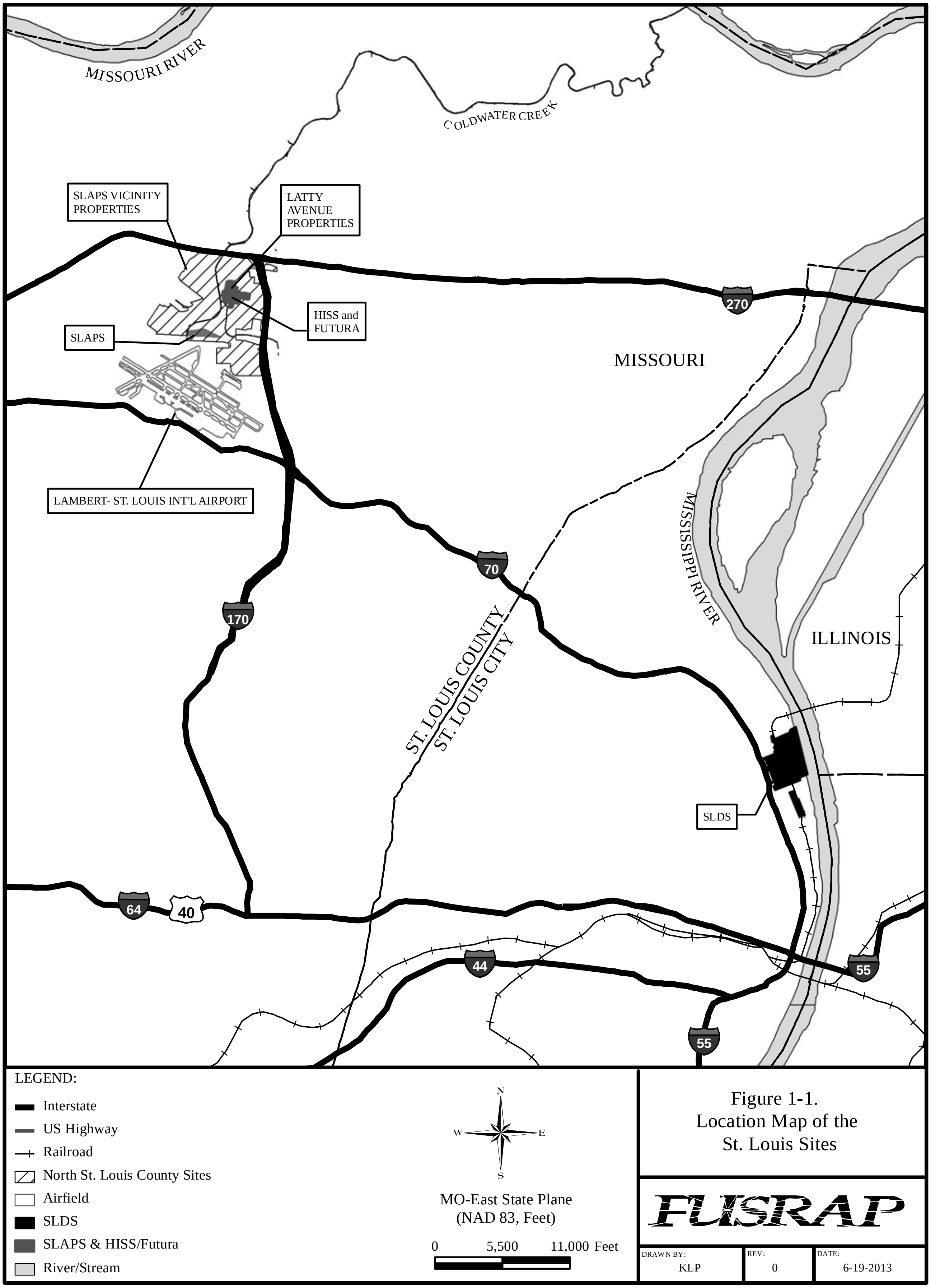
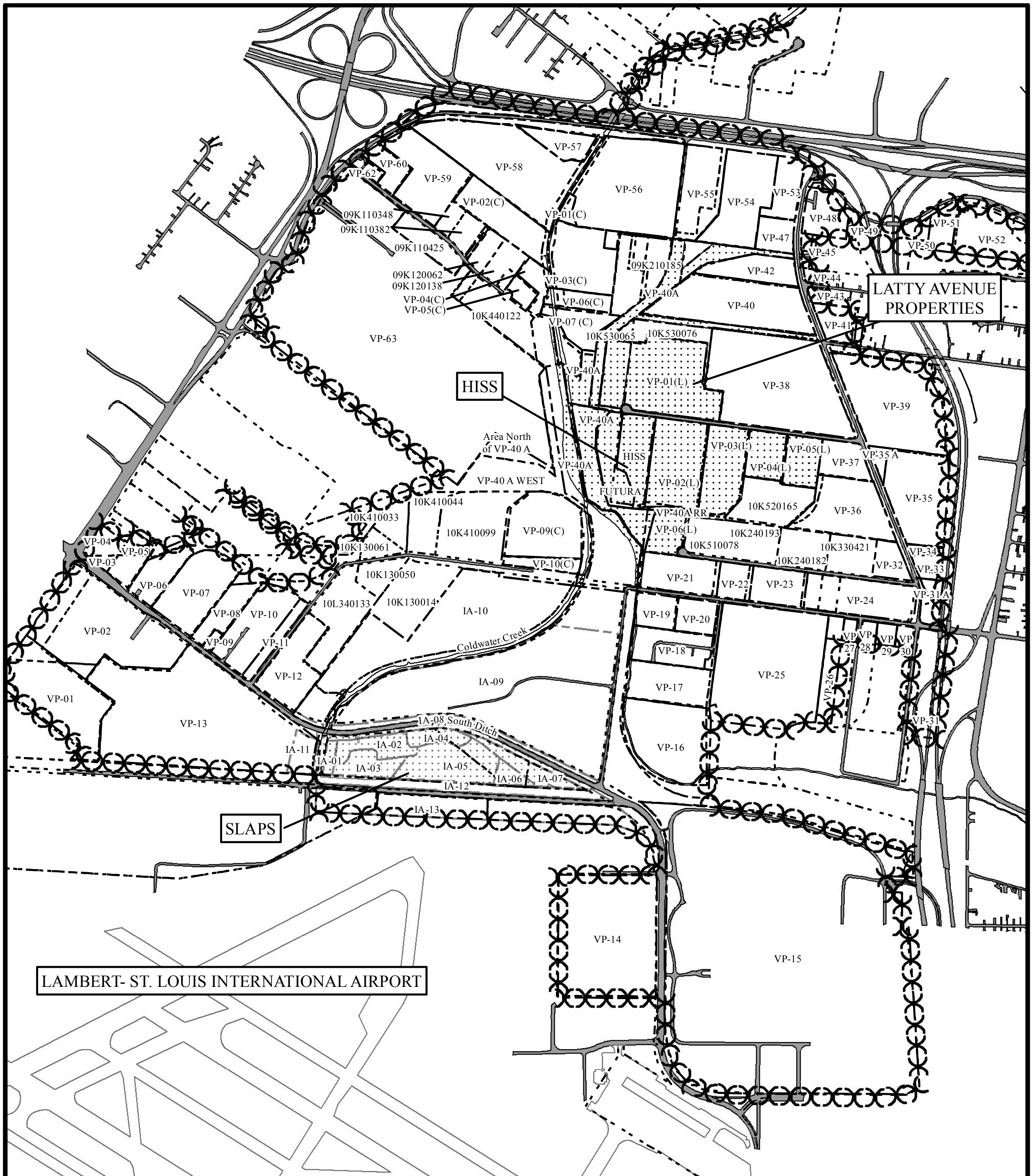


Figure 1-1.
Location Map of the
St. Louis Sites

Path: \\Corps-002\gis\GPS\EMDAR\SLDS Projects\FY2013\Rev0\Figure 1-1 Location Map of the St Louis Site.mxd

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 1-2 Plan View of the SLAPS and SLAPS VPs.mxd



LEGEND:

- Road
- Parcel Boundary
- ROD Boundary
- Airfield
- General Location of SLAPS and Latty Avenue Properties
- Investigation Areas
- River/Stream

N
W E
S

MO-East State Plane
(NAD 83, Feet)

Figure 1-2.
Plan View of the
SLAPS, SLAPS VPs,
and Latty Avenue Properties

FUSRAP

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KLP	0	6-19-2013

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 1-3 Plan View of the Latty Avenue VPs including HISS and Futura.mxd

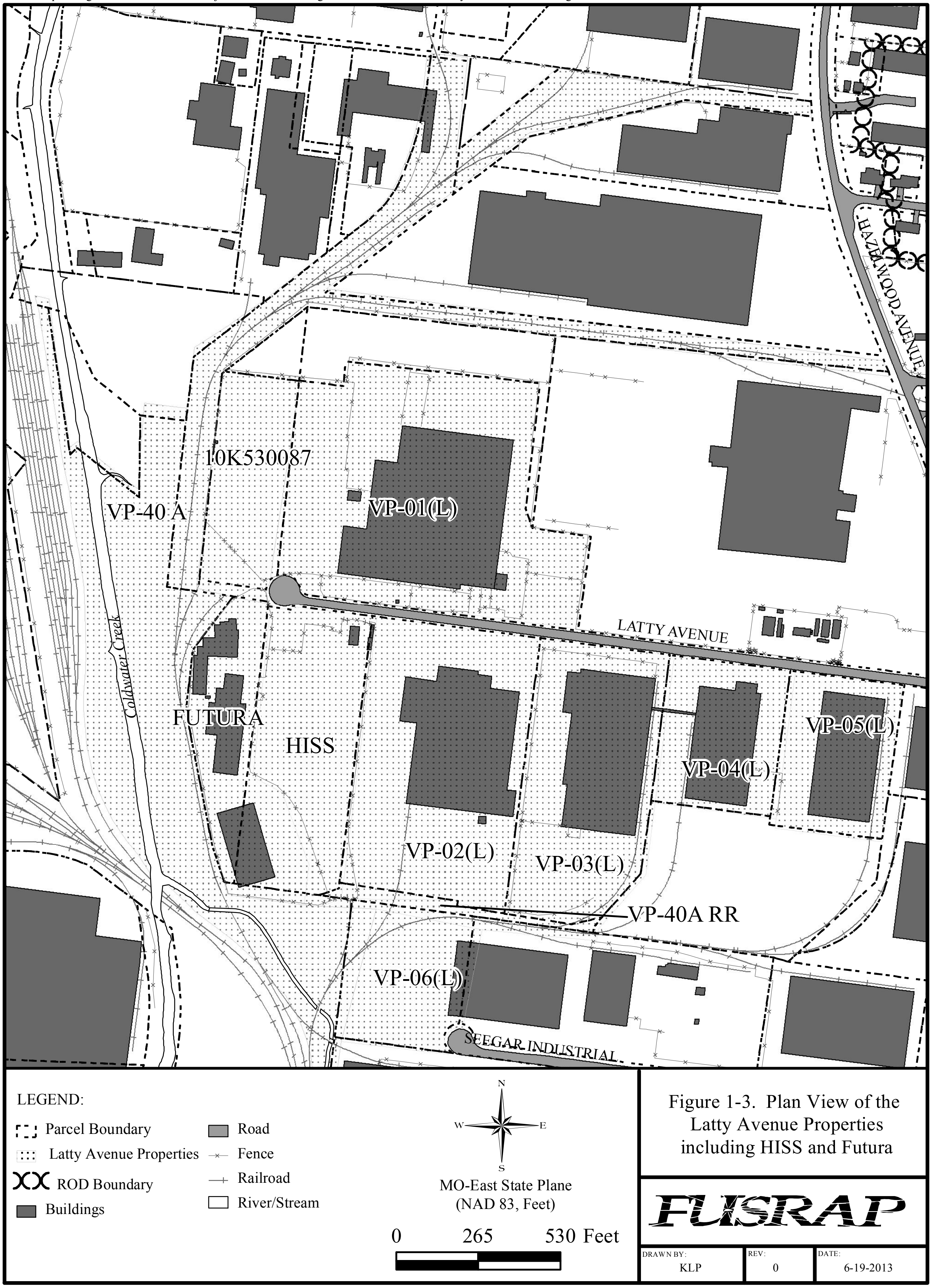
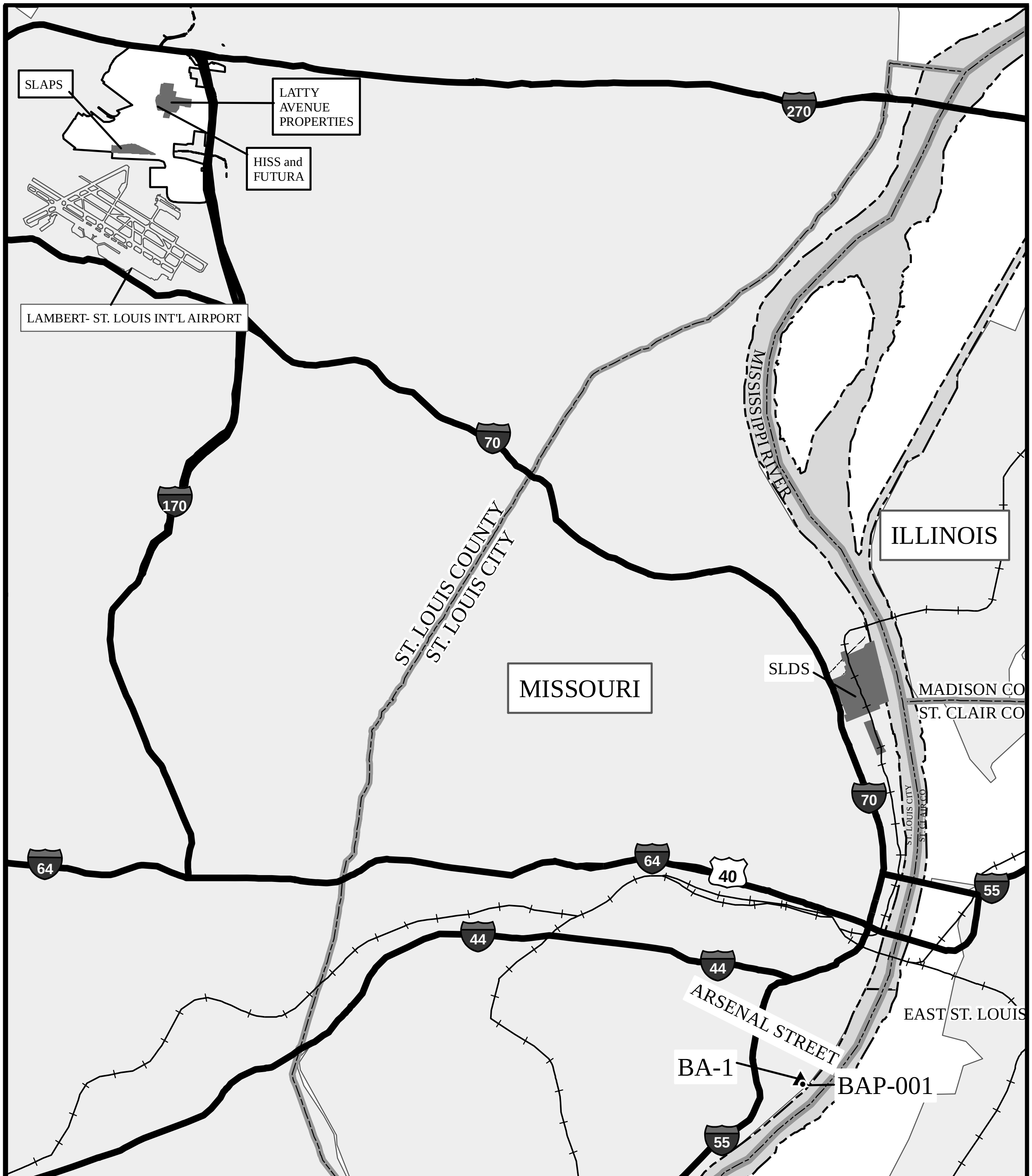


Figure 1-3. Plan View of the Latty Avenue Properties including HISS and Futura

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 2-1 Gamma Radiation, Rn, and Particulate Air Monitoring at St. Louis Background Location.mxd



LEGEND:
- Railroad
- Roads
- US Highway
- River/Stream
- State/County Boundary

● BA = Background monitoring for external gamma (TLD) and radon monitor (alpha track)

▲ BAP = Background air particulate monitor

N
W E
S

MO-East State Plane (NAD 83, Feet)

0 4,700 9,400 Feet

Figure 2-1. Gamma Radiation, Rn, and Particulate Air Monitoring at St. Louis Background Location - USACE Service Base

FUSRAP

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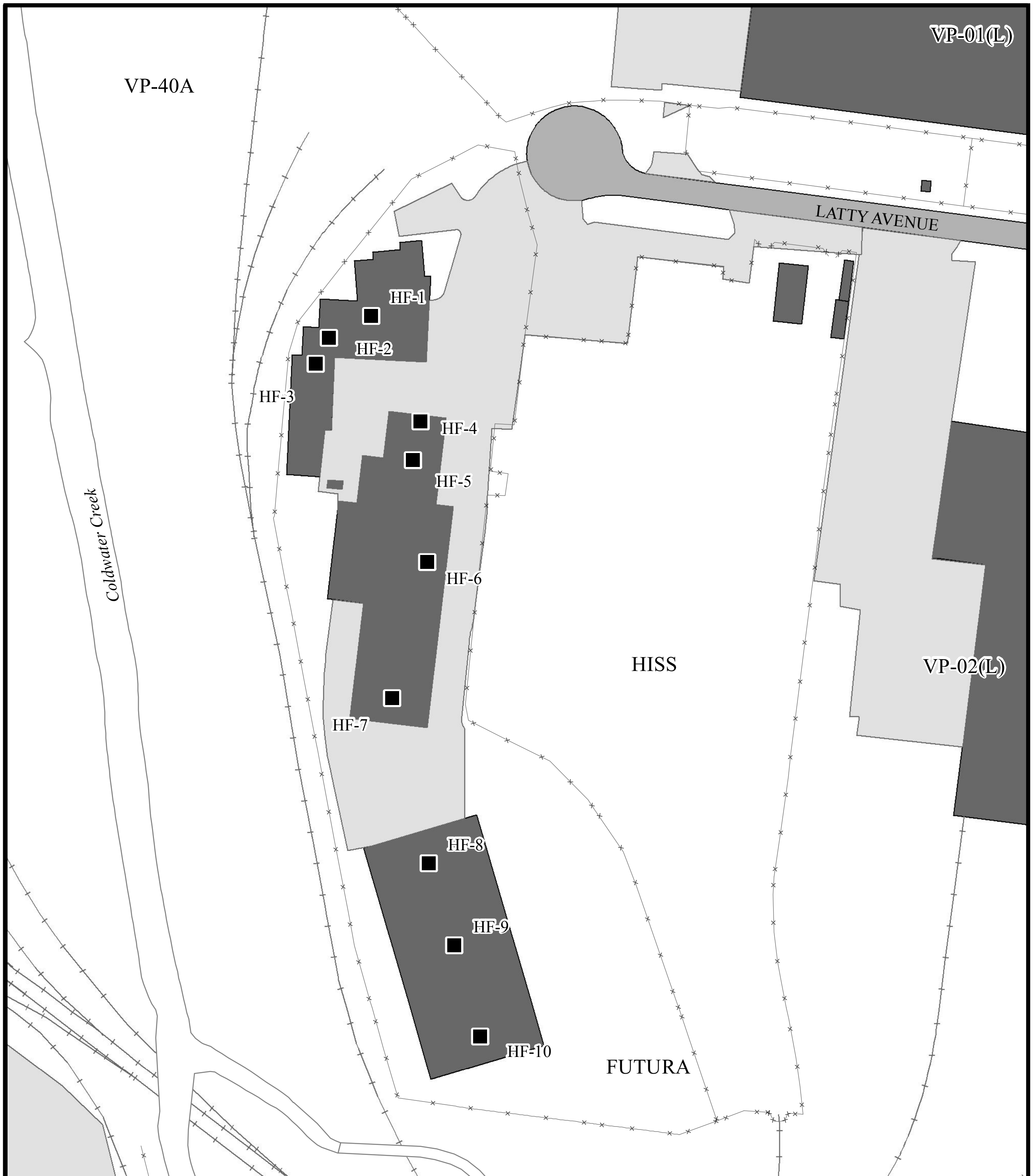
Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 2-2 Gamma Radiation, Rn, and Particulate Air Monitoring Locations at the Latty Avenue Properties.mxd



LEGEND:

- Buildings
- Parking Lots
- Road
- River/Stream
- Fence
- Railroad

■ HF= Futura Indoor Air Monitoring for Radon Monitor (ATD)

N W E S

MO-East State Plane
(NAD 83, Feet)

0 80 160 Feet

Figure 2-2. Radon Monitoring Locations at the Latty Avenue Properties

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Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 2-3 Gamma Radiation, Rn, and Particulate Air Monitoring Locations at the SLAPS and SLAPS VPs.mxd

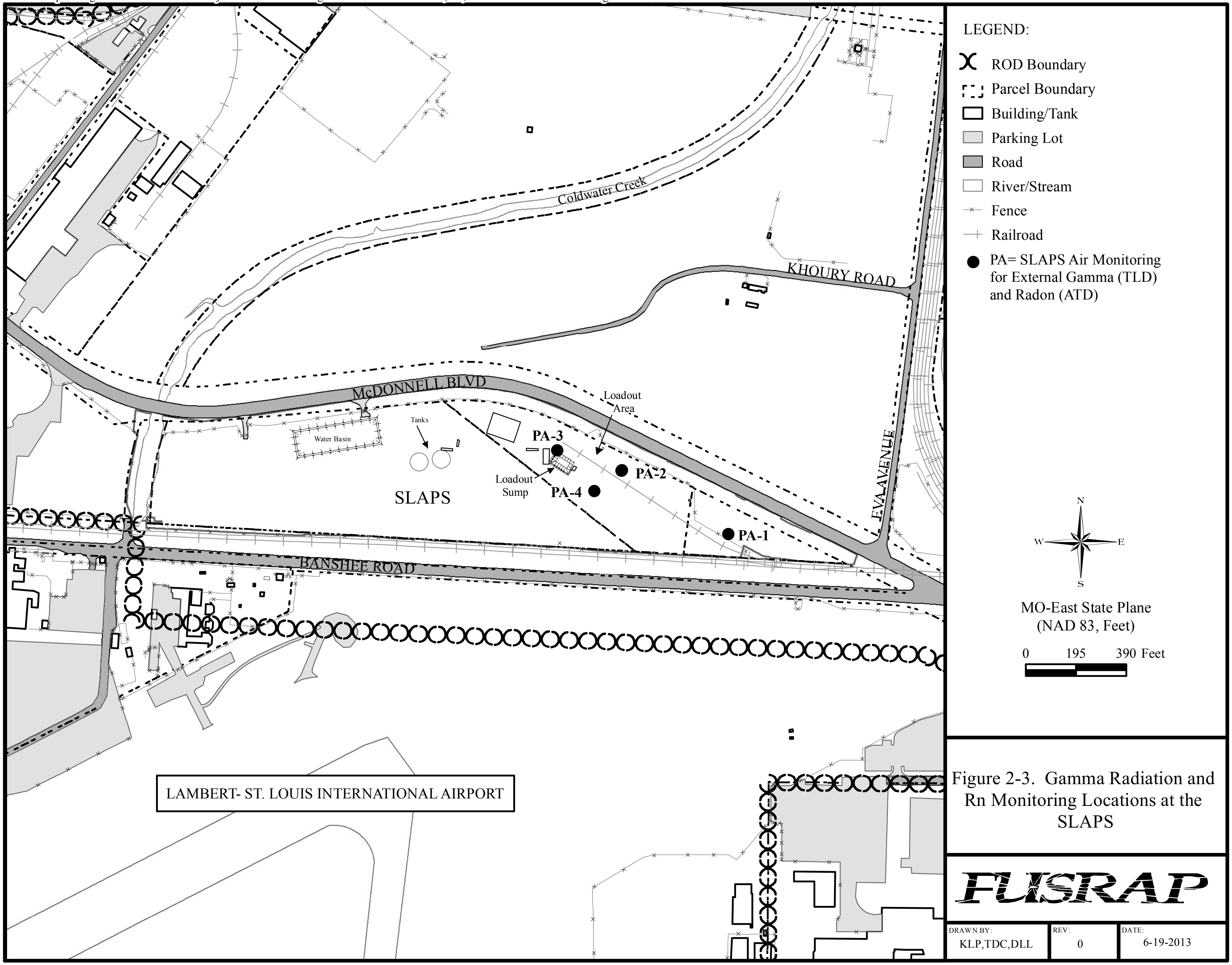

Figure 2-3. Gamma Radiation and Rn Monitoring Locations at the SLAPS

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 3-1 MSD Discharge Point for Waste Water from the HISS Labratory.mxd

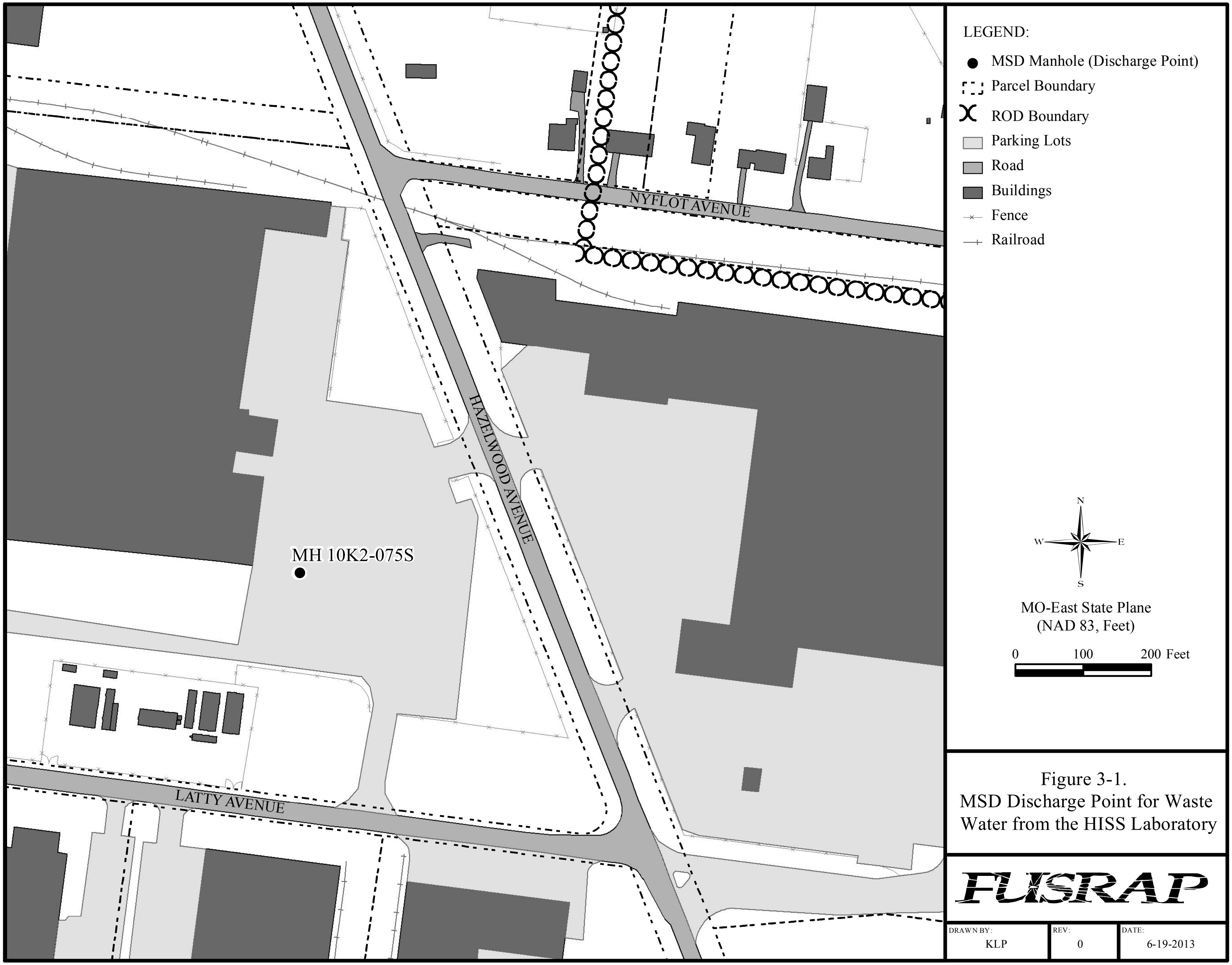

Figure 3-1.
MSD Discharge Point for Waste Water from the HISS Laboratory

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Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 3-2 Storm-Water Outfalls and MSD Excavation-Water Discharge Point at SLAPS.mxd

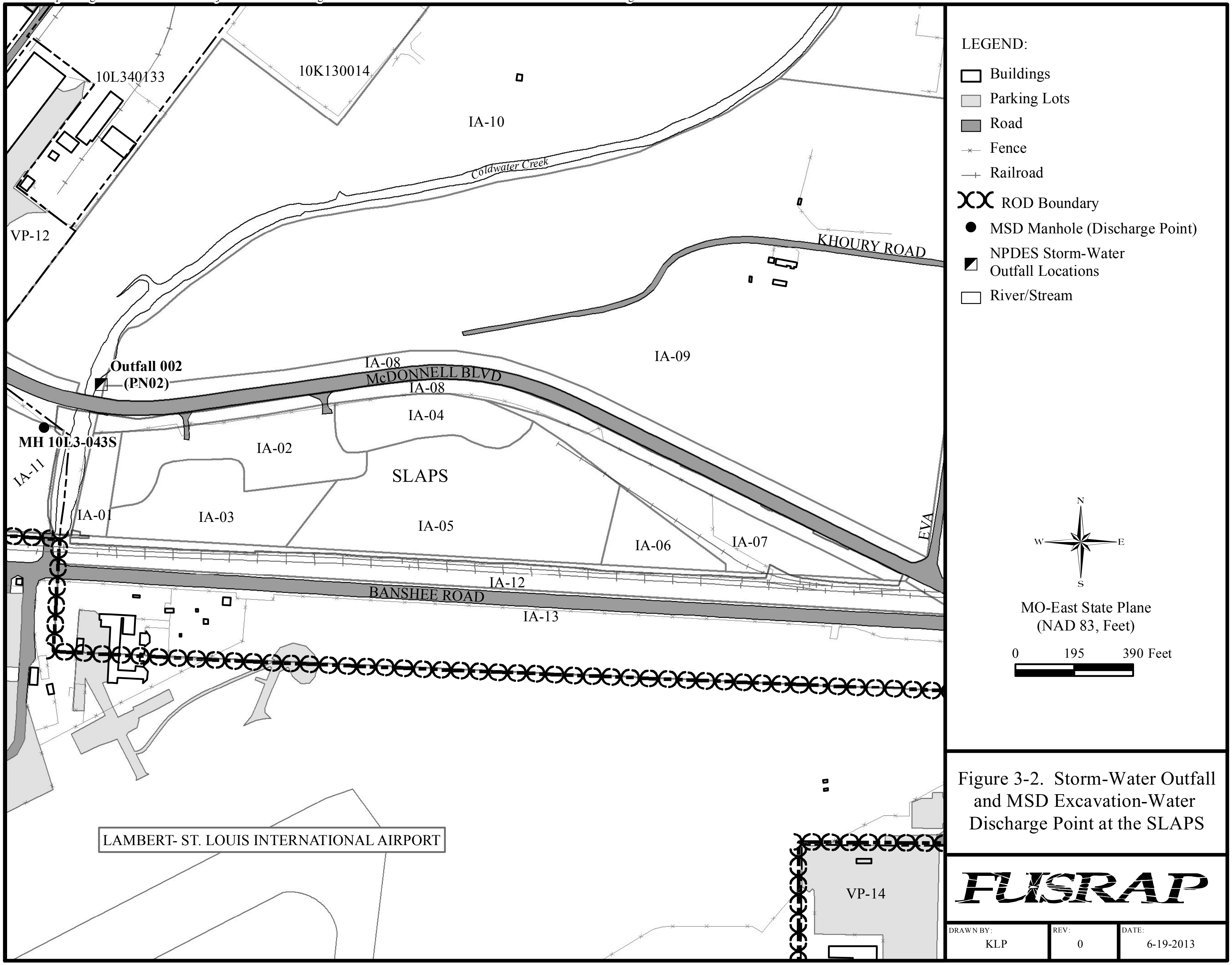

Figure 3-2. Storm-Water Outfall and MSD Excavation-Water Discharge Point at the SLAPS

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 3-3 Surface-Water and Sediment Sampling Locations at Coldwtater Creek.mxd

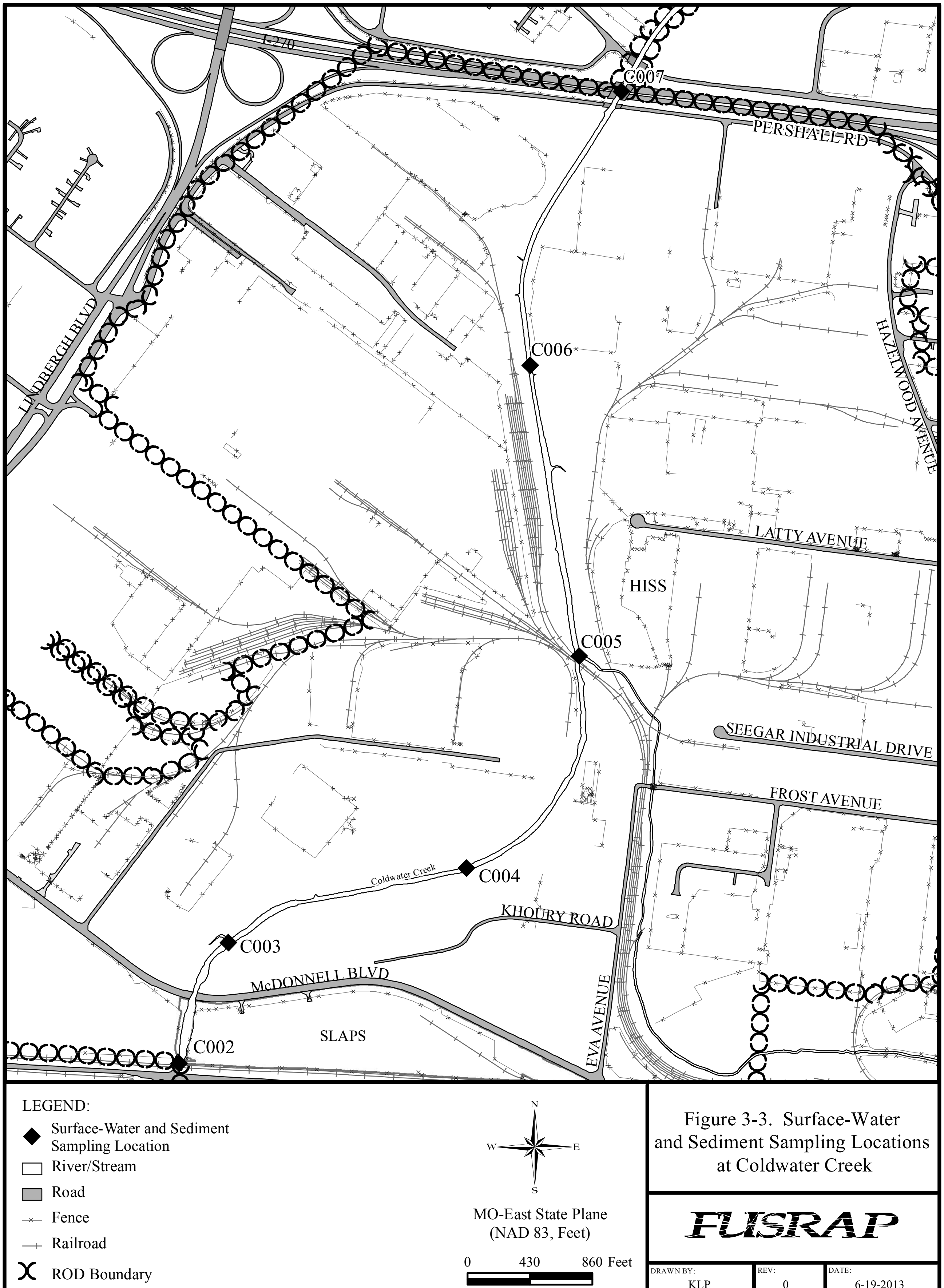

Figure 3-3. Surface-Water and Sediment Sampling Locations at Coldwater Creek

FUSRAP

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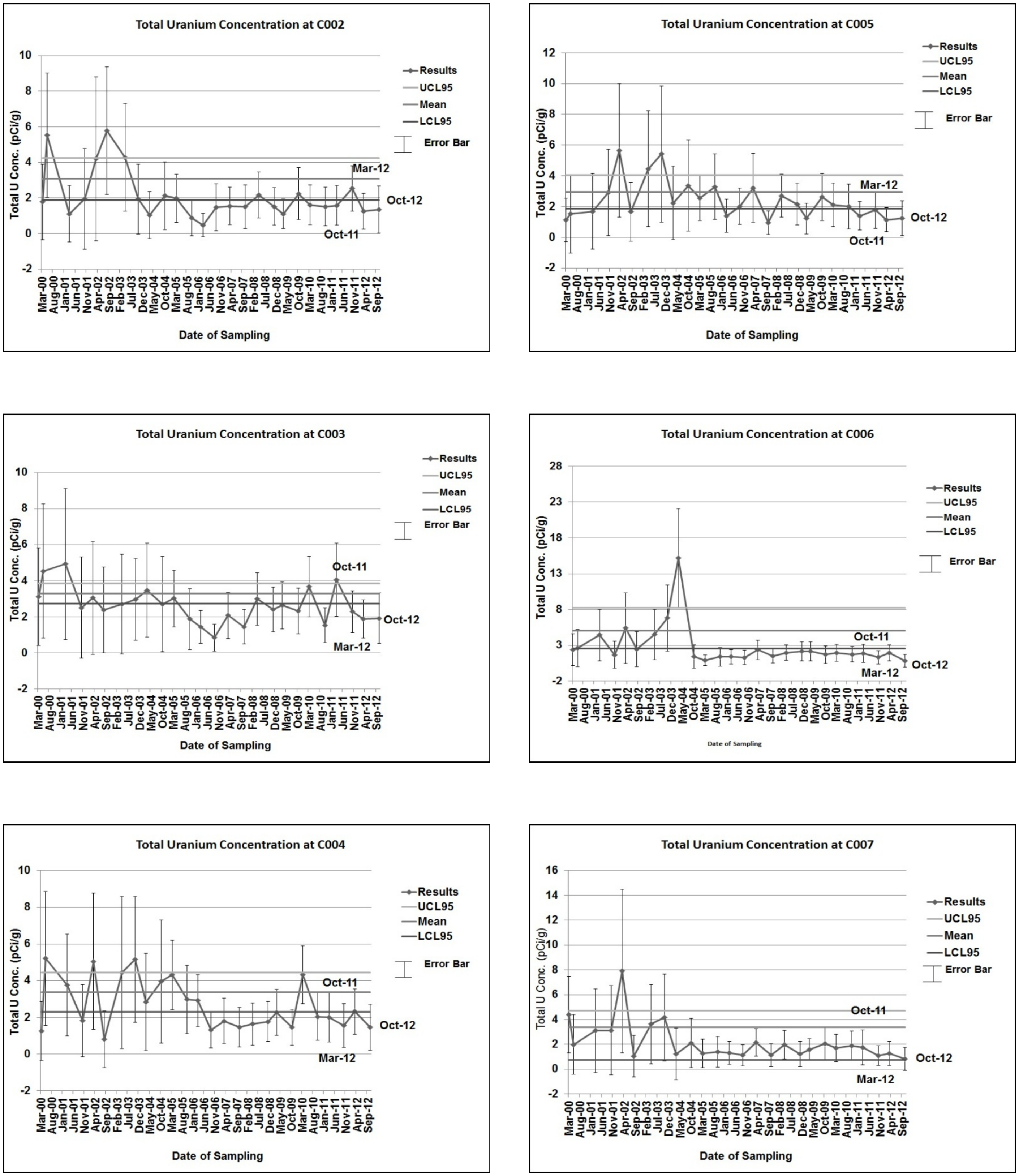
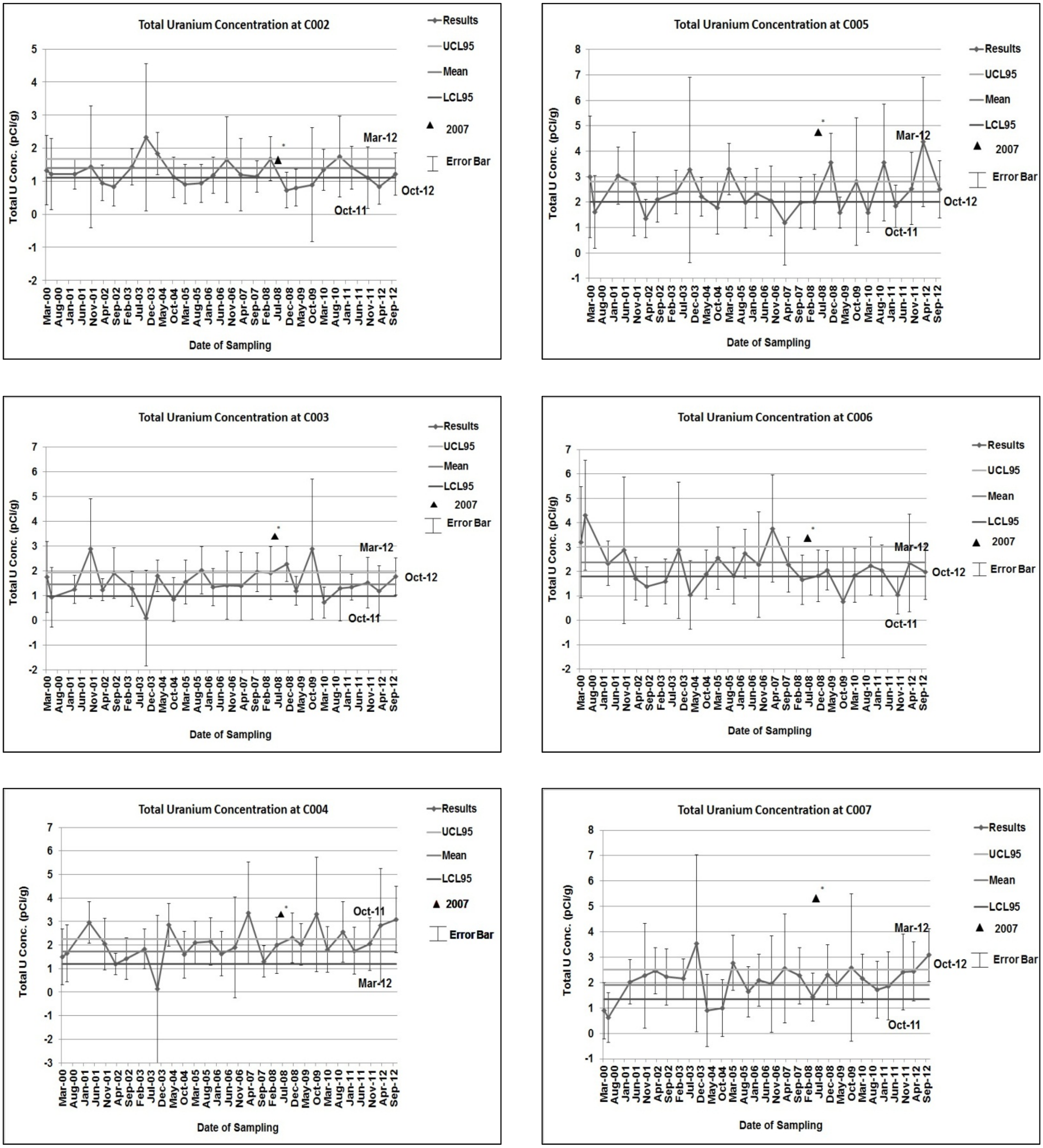


Figure 3-4. Total U Concentrations in Surface Water Versus Sampling Date



* The October 2007 value was incorrectly graphed due to the alpha and gamma results being added together, artificially increasing the value. The charts above have been corrected.

Figure 3-5. Total U Concentrations in Sediment Versus Sampling Date

Zone	Period	Epoch	Stratigraphy	Thickness (ft.)	Description
Hydrostratigraphic zone (HZ)-A	Quaternary	Holocene	FILL/TOPSOIL	0-14	**UNIT 1** Fill - Sand, silt, clay, concrete, rubble. Topsoil - Organic silts, clayey silts, wood, fine sand.
		Pleistocene	LOESS (CLAYEY SILT)	11-32	**UNIT 2** Clayey silts, fine sands, commonly mottled with iron oxide staining. Scattered roots and organic material, and a few fossils.
			GLACIOLACUSTRINE SERIES: SILTY CLAY	19-75 (3) 9-27 (3T)	**UNIT 3** Silty clay with scattered organic blebs and peat stringers. Moderate plasticity. Moist to saturated. (3T)
Hydrostratigraphic zone (HZ)-B			VARVED CLAY	0-8	Alternating layers of dark and light clay as much as 1/16 inch thick (3M)
			CLAY	0-26	Dense, stiff, moist, highly plastic clay. (3M)
Hydrostratigraphic zone (HZ)-C			SILTY CLAY	10-29	Similar to upper silty clay. Probable unconformable contact with highly plastic clay. (3B)
			BASAL CLAYEY & SANDY GRAVEL	0-6	**UNIT 4** Glacial clayey gravels, sands, and sandy gravels. Mostly chert.
Hydrostratigraphic zone (HZ)-D	Pennsylvanian		Cherokee (?) group (undifferentiated)	0-35	**UNIT 5** BEDROCK: Interbedded silty clay/shale, lignite/coal, sandstone, and siltstone. Erosionally truncated by glaciolacustrine sequences. (Absent at the HISS).
Hydrostratigraphic zone (HZ)-E	Mississippian		STE. GENEVIEVE ST. LOUIS LIMESTONES	10+	**UNIT 6** BEDROCK: Hard, white to olive, well cemented, sandy limestone with interbedded shale laminations.

FUSRAP

Figure 4-1. Generalized Stratigraphic Column for the NC Sites

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Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 4-2 Existing Monitoring Well Locations at the Latty Avenue Properties.mxd

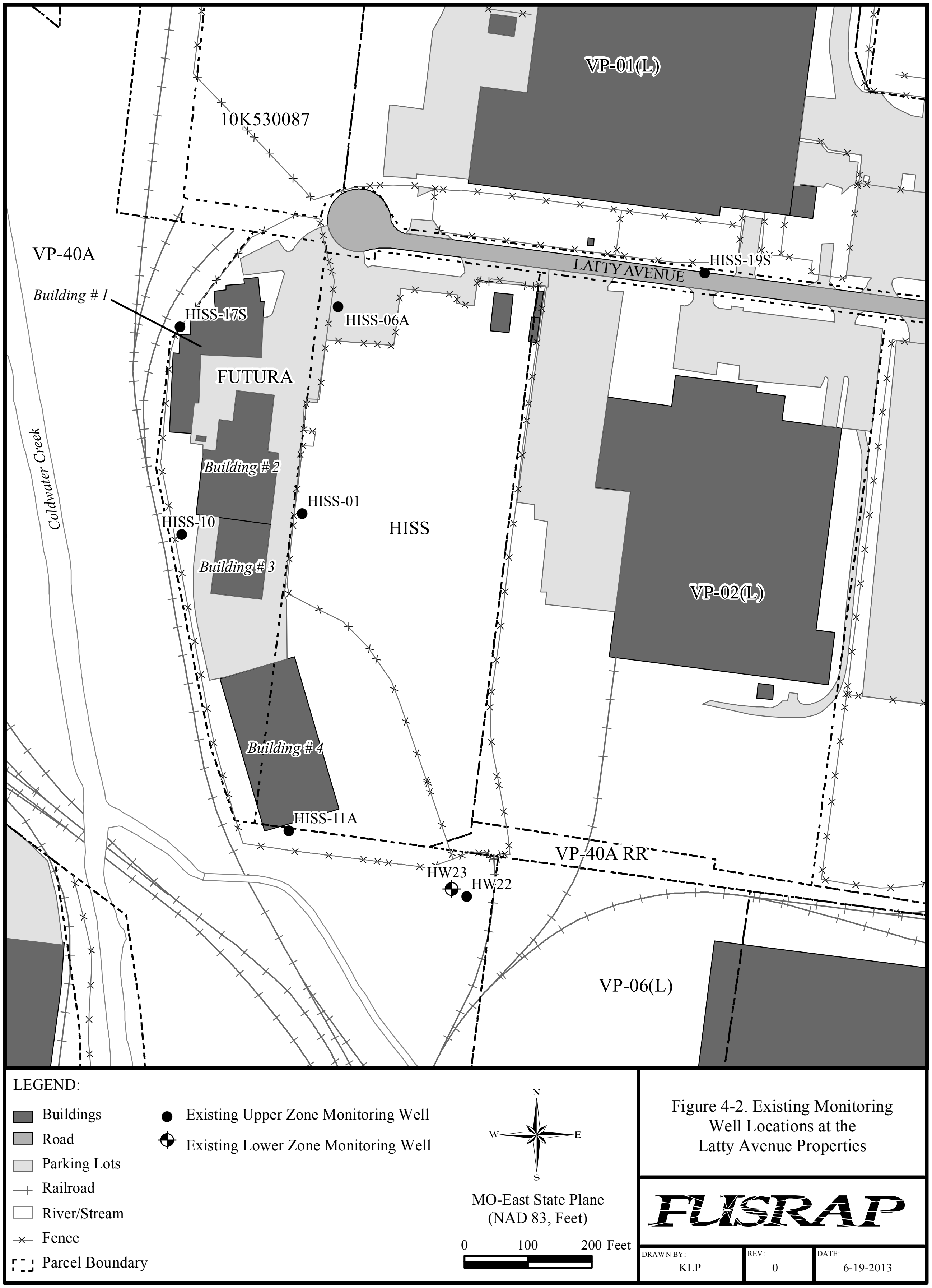

Figure 4-2. Existing Monitoring Well Locations at the Latty Avenue Properties

FUSRAP

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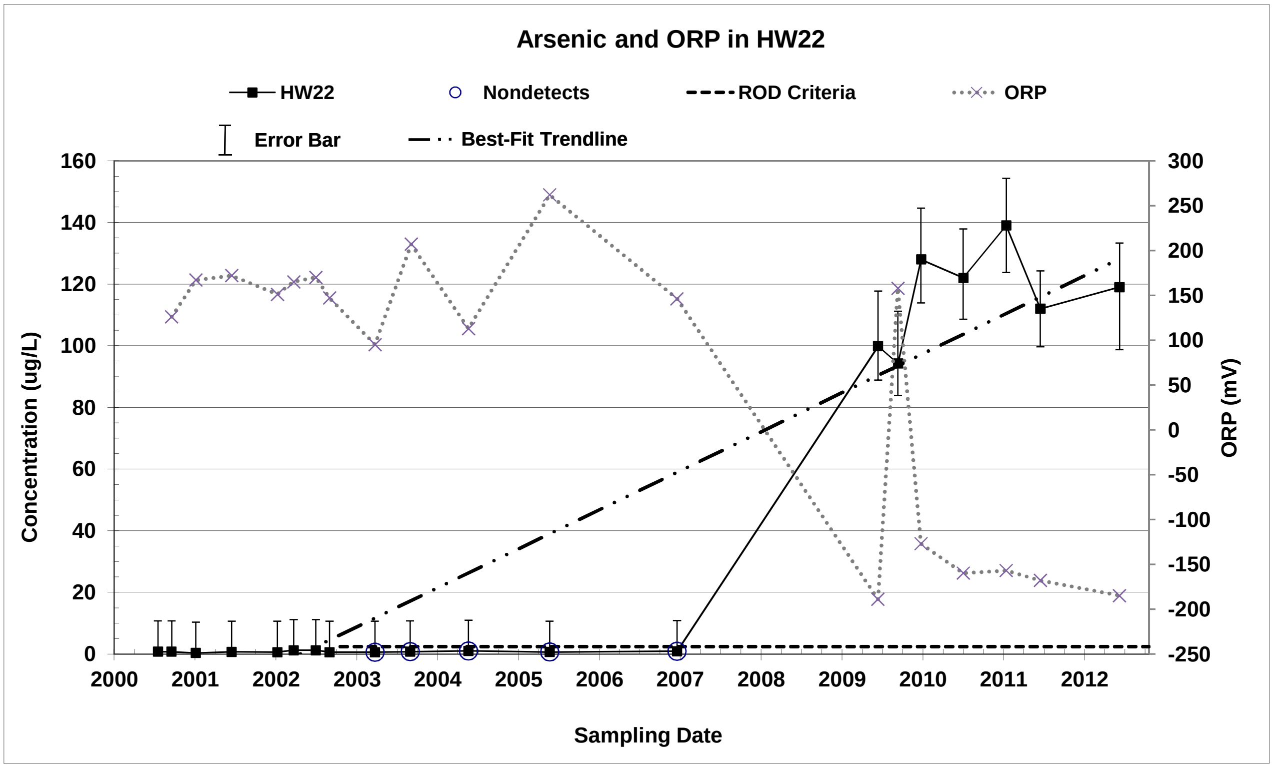

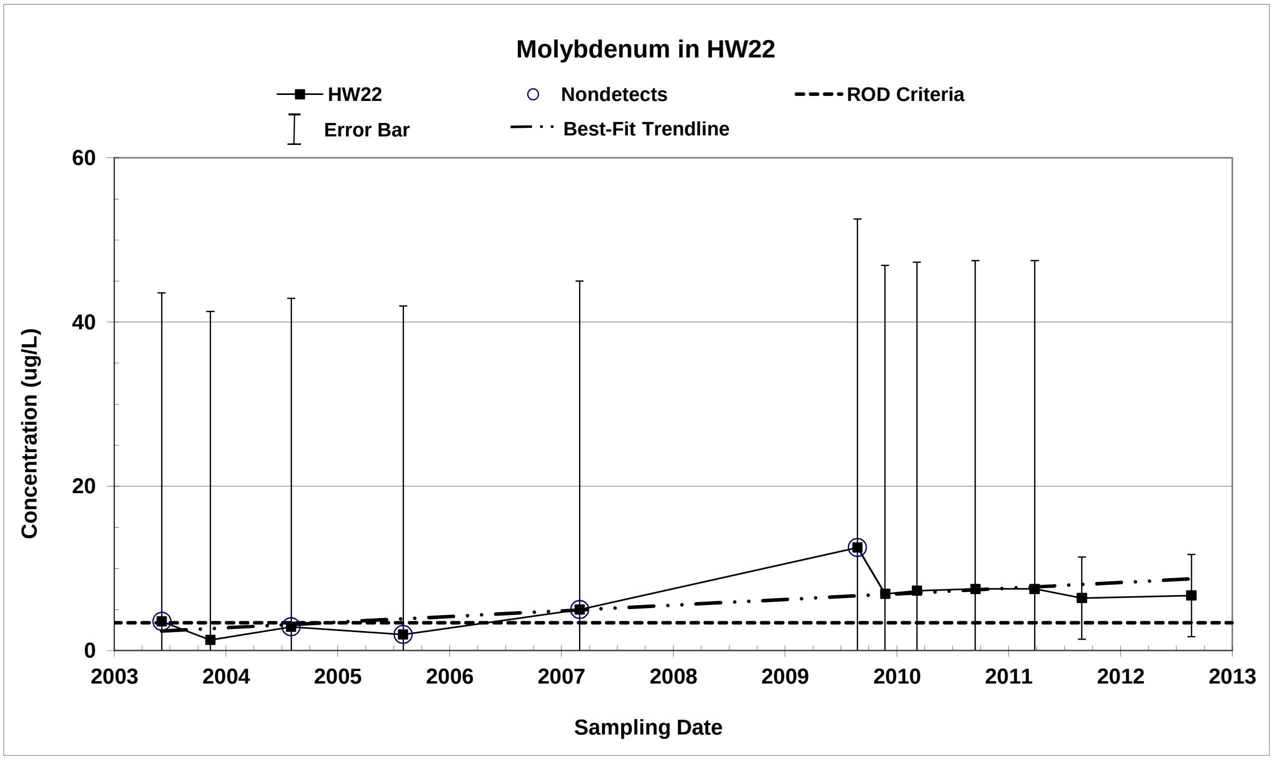

Notes:

For results < 3 times the reporting limit (RL), the error bar represents ± RL. For results exceeding 3 times the RL, the error bar represents the upper and lower control limits on the control spike samples.

For results reported as nondetect, the value plotted is 1/2 the detection limit.

Figure 4-3. Time-Versus-Concentration Graph for Arsenic and Molybdenum in Ground Water at HW22

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 4-4 Selenium Concentrations in Unfiltered HZ-A Ground Water at the Latty Avenue Properties.mxd

Legend

- Existing HZ-A Monitoring Well
- Existing HZ-C Monitoring Well
- River/Stream
- Parcel Boundary
- Fence
- Railroad
- Road
- Buildings
- Error Bars

MO-East State Plane
(NAD 83, Feet)

0 100 200 Feet

Figure 4-4. Total U Concentrations in Unfiltered Ground Water at the Latty Avenue Properties

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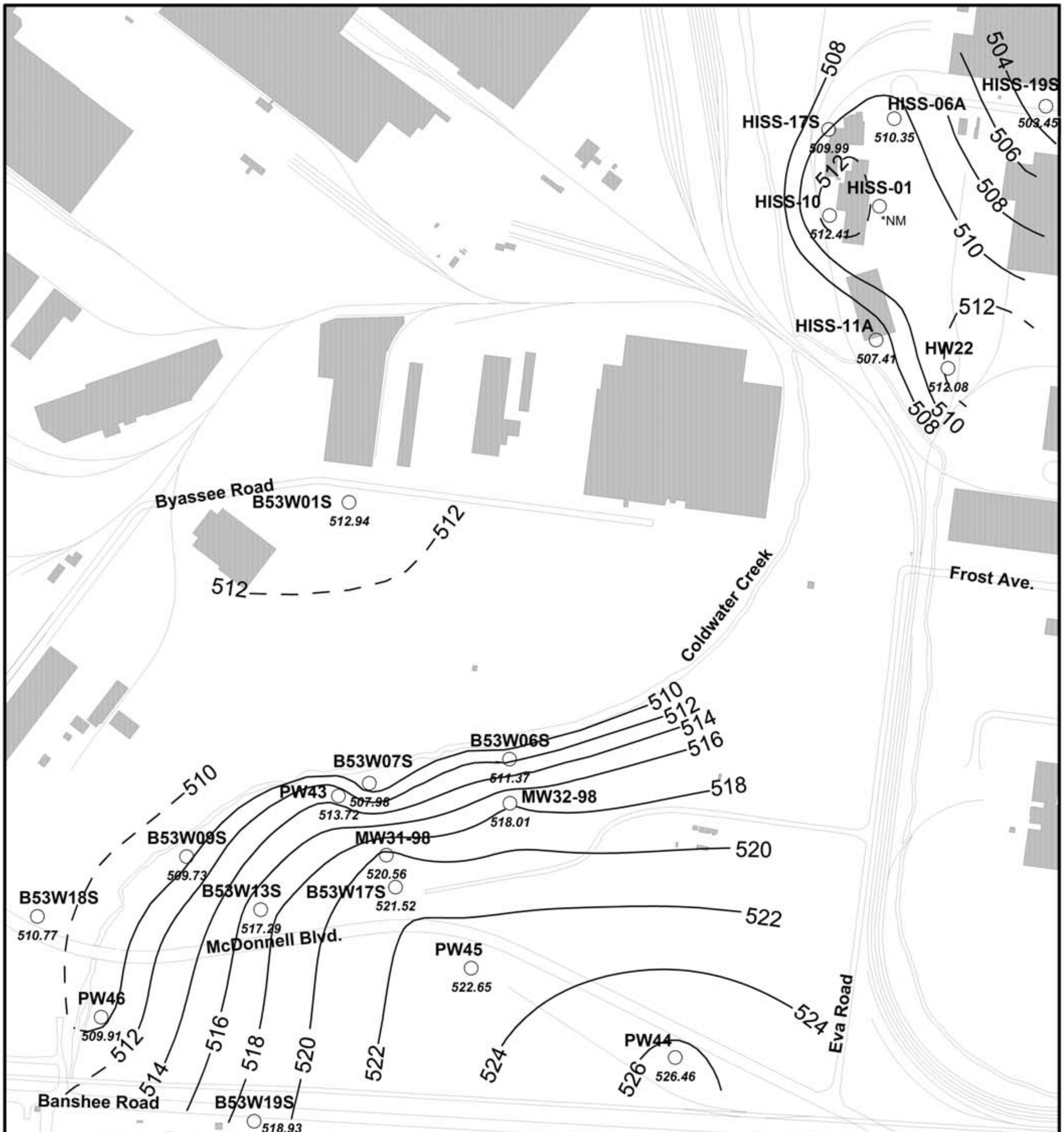


Legend:

—— HZ-A Ground-Water Elevation Contours

○ HZ-A Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 2 ft.

**NM = Not Measured*

Scale: 1 inch = 600 feet

0 300 600 900 1200

N

MO - East State Plane Coordinate System (NAD83, Feet)

FUSRAP

Figure 4-5. HZ-A Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (May 24, 2012)

DRAWN BY:	REV. - DATE:
CMW	1 - 2/27/2013

Legend:

——— HZ-C Ground-Water Elevation Contours

○ HZ-C Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 1 ft.

N

Scale: 1 inch = 600 feet

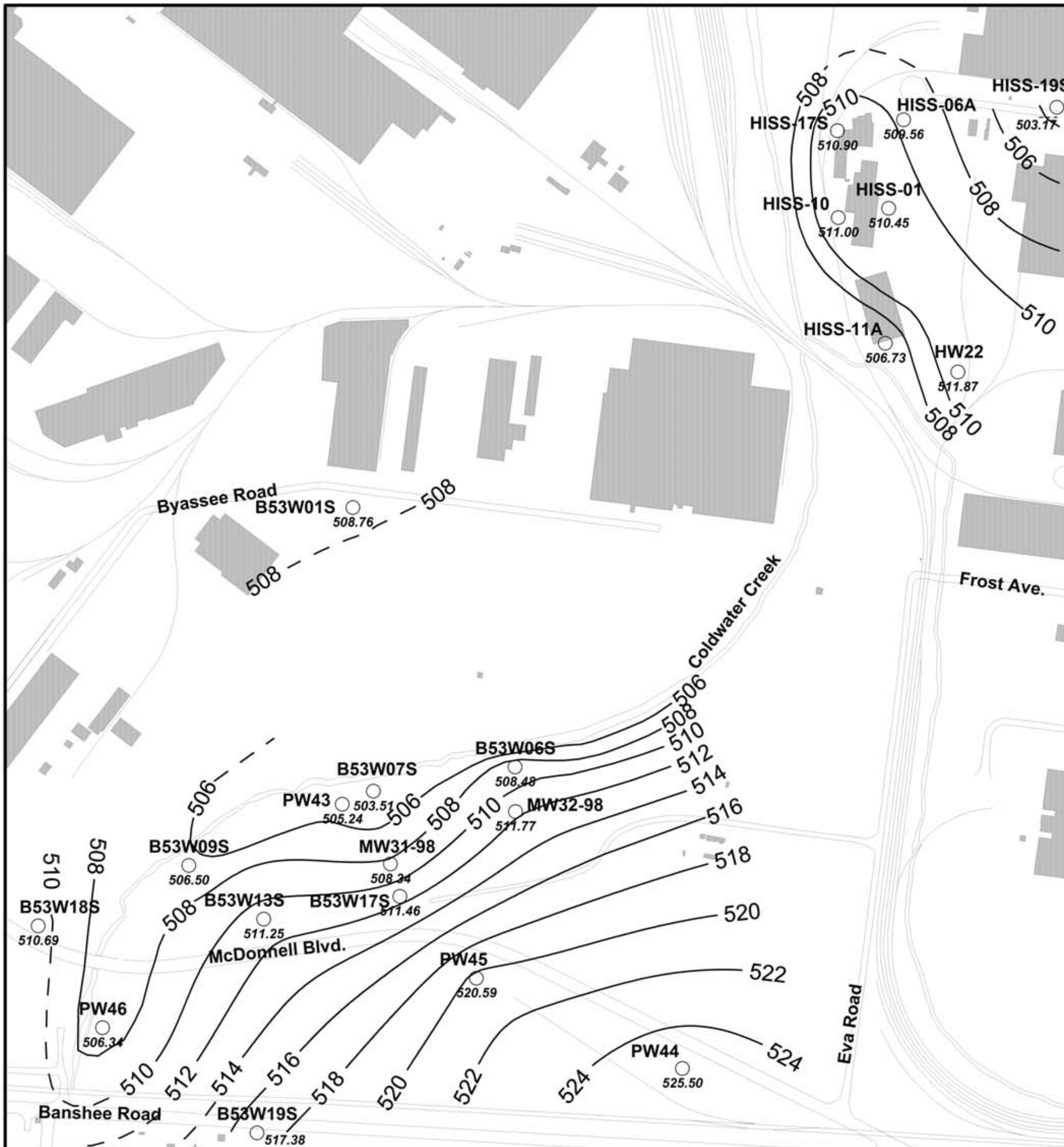
0 300 600 900 1200

MO - East State Plane Coordinate System (NAD83, Feet)

FUSRAP

Figure 4-6. HZ-C Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (May 24, 2012)

DRAWN BY:	REV. - DATE:
CMW	0 - 8/22/12



Legend:

HZ-A Ground-Water Elevation Contours

HZ-A Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 2 ft.

FUSRAP

Figure 4-7. HZ-A Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (December 7, 2012)

DRAWN BY:	REV. - DATE:
CMW	0 - 2/26/2013

Legend:

HZ-C Ground-Water Elevation Contours

HZ-C Monitoring Well Locations

Ground-water elevations in feet AMSL; contours dashed where inferred
Contour Interval = 1 ft.

Scale: 1 inch = 600 feet

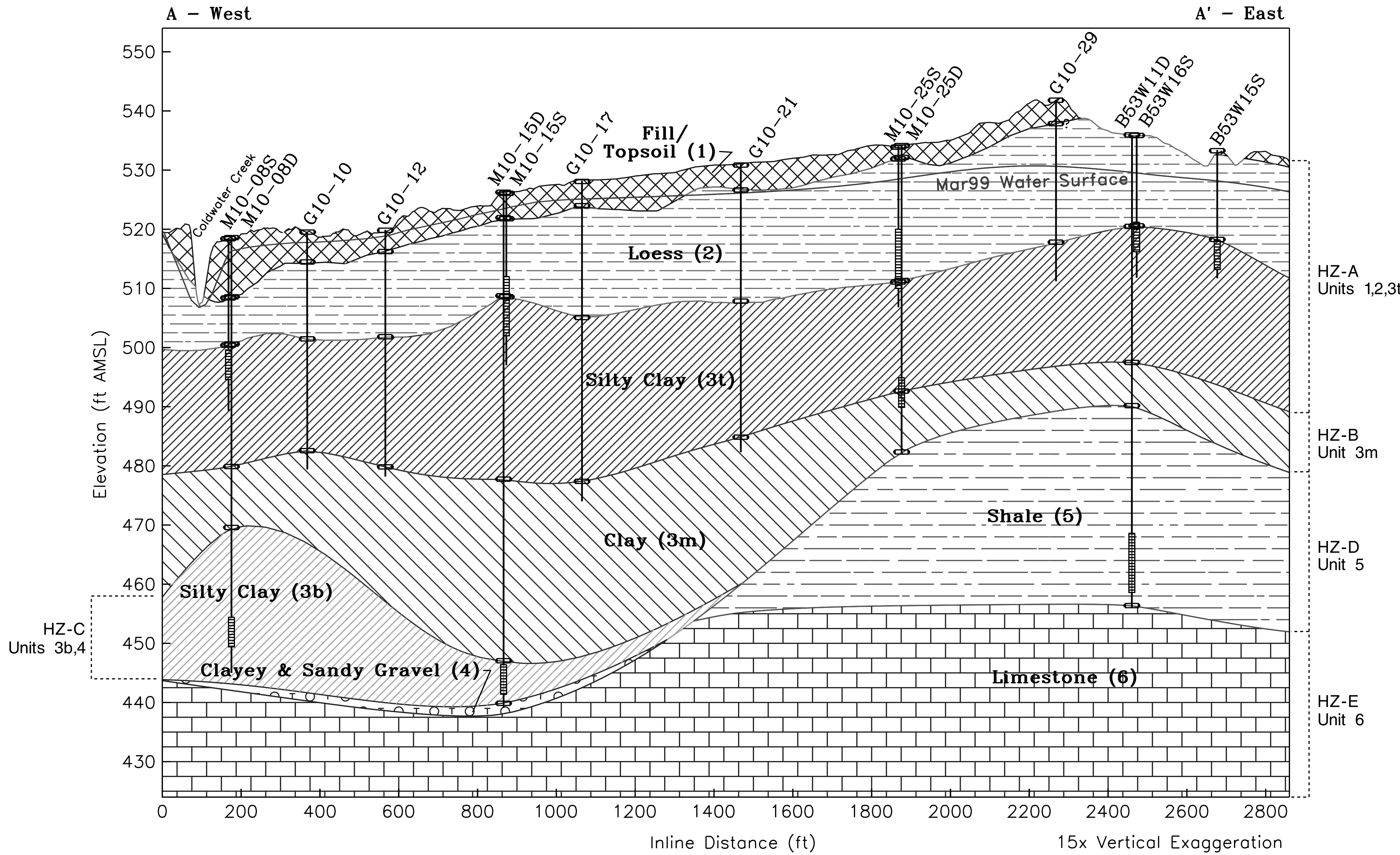
0 300 600 900 1200

MO - East State Plane Coordinate System (NAD83, Feet)

FUSRAP

Figure 4-8. HZ-C Potentiometric Surface at the Latty Avenue Properties and the SLAPS and SLAPS VPs (December 7, 2012)

DRAWN BY: CMW	REV. - DATE: 0 - 2/26/13



Notes

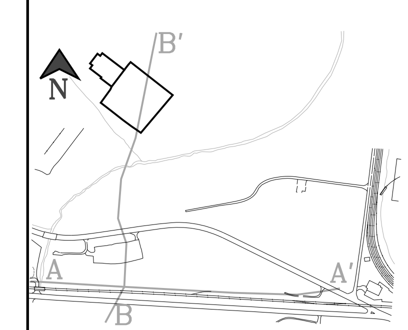
Geologic data used in the cross section collected through 2000.

Legend

Borehole pick

Well screen

Cross Section Location Map



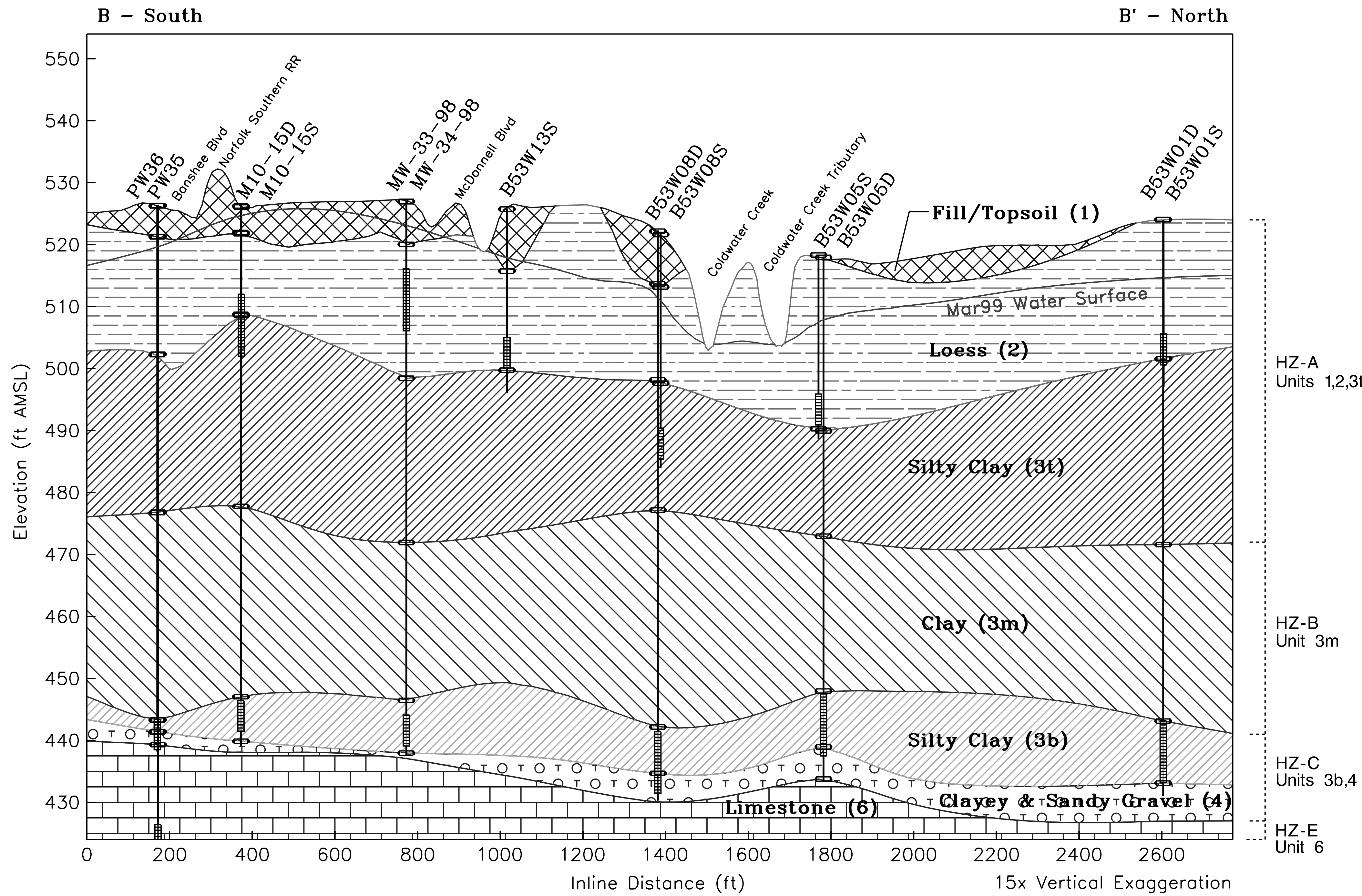
FUSRAP

Figure 4-9. Geologic Cross-Section A-A' at the SLAPS

Drawn By: N. Voorhies

Rev. No. - Date: 0 - 08/29/00

File: SLAPSGlg05ExtendedAAS.sho



Notes

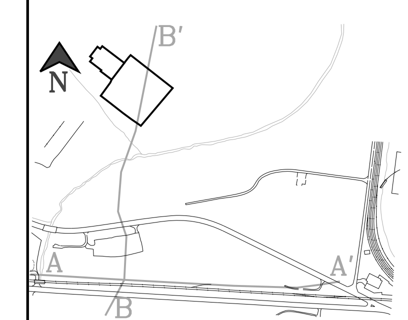
Geologic data used in the cross section collected through 2000.

Legend

Borehole pick

Well screen

Cross Section Location Map



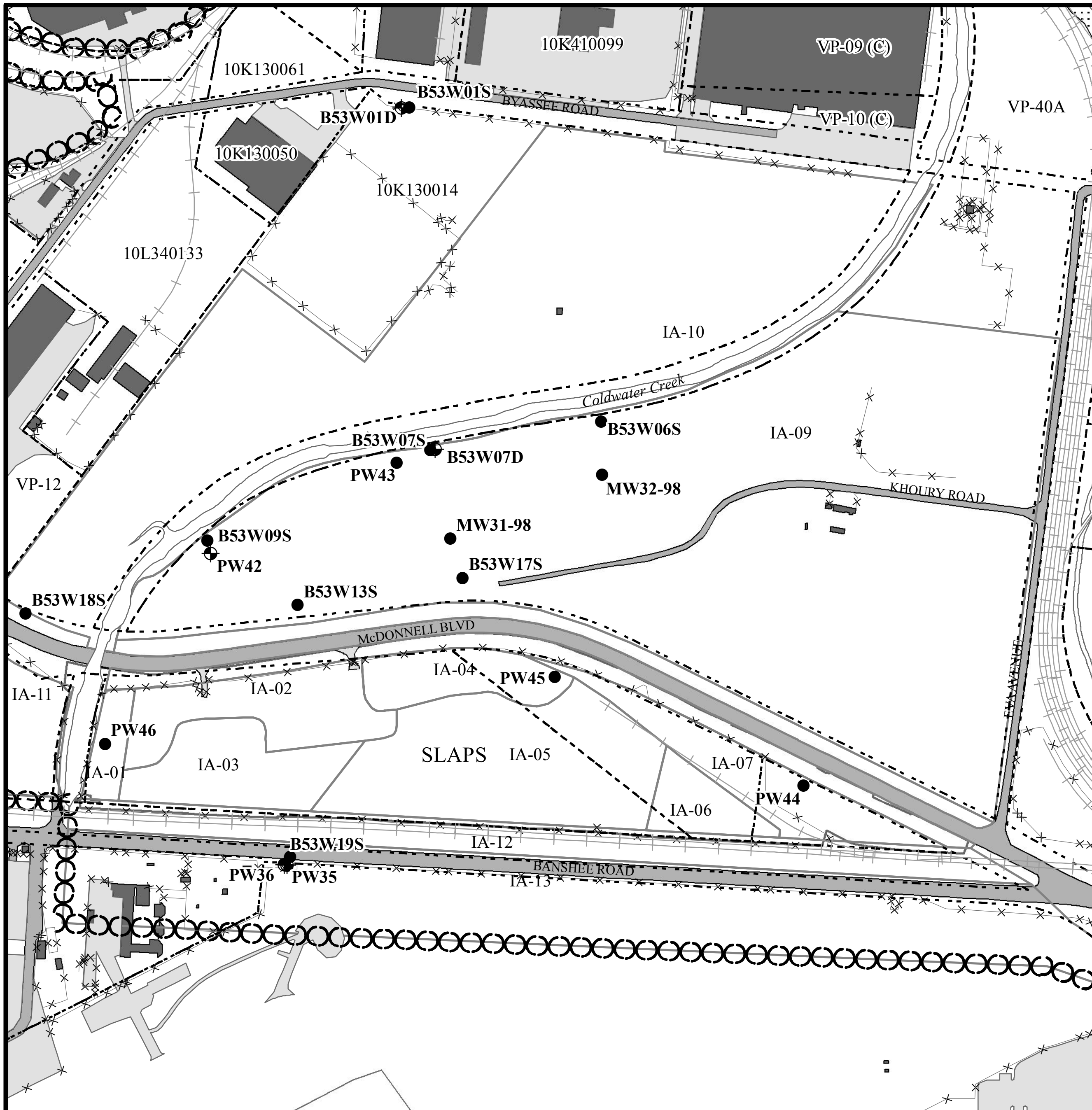
FUSRAP

Figure 4-10. Geologic Cross-Section B-B' at the SLAPS and SLAPS VPs

Drawn By: N. Voorhies

Rev. No.- Date: 0 - 08/29/00

File: SLAPSGlg05ExtendedBBS.sho

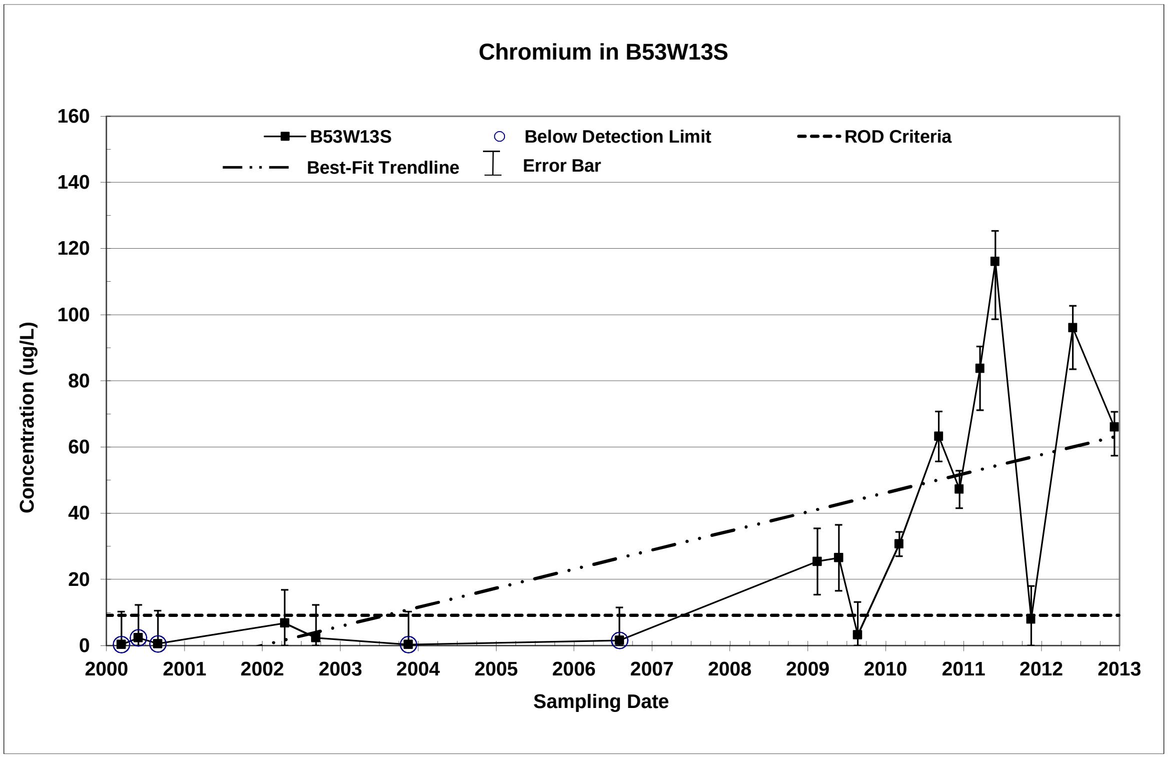


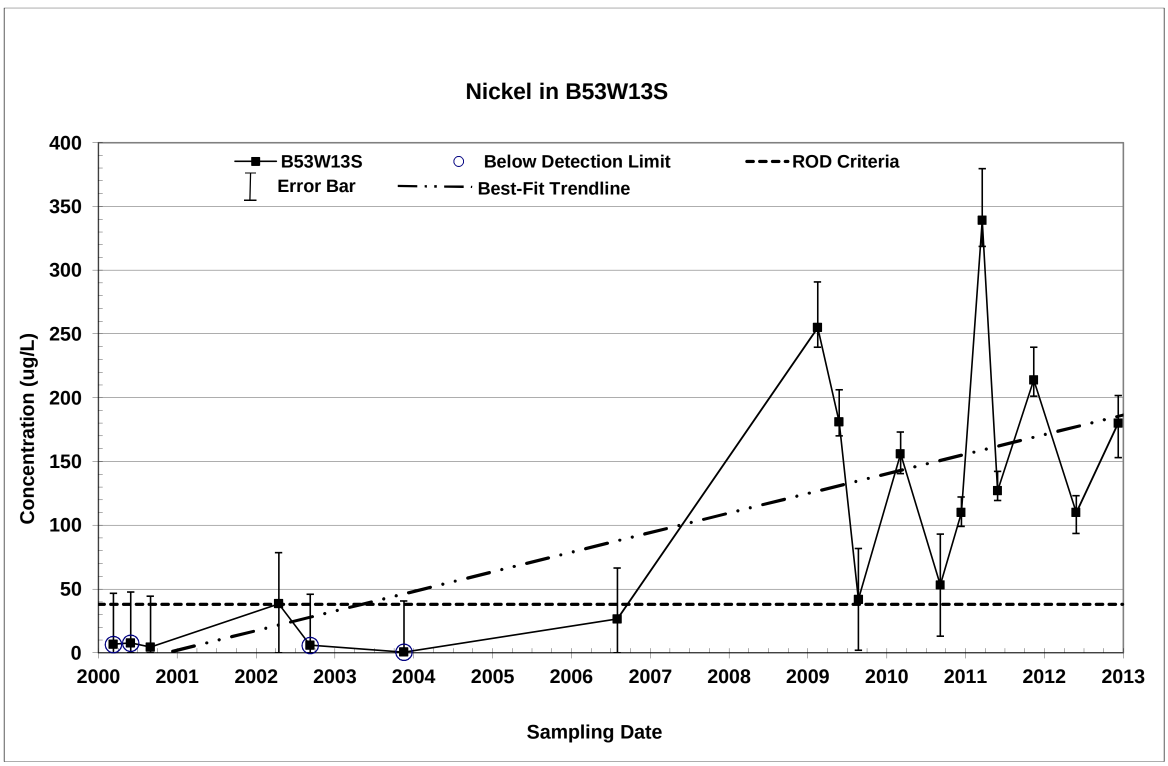
Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 4-11 Ground-Water Monitoring Locations at the SLAPS and Surrounding SLAPS VPs.mxd

Figure 4-11. Existing Ground-Water Monitoring Locations at the SLAPS and Surrounding SLAPS VPs

FUSRAP

DRAWN BY:	REV:	DATE:
RLH,TDC	0	6-19-2013



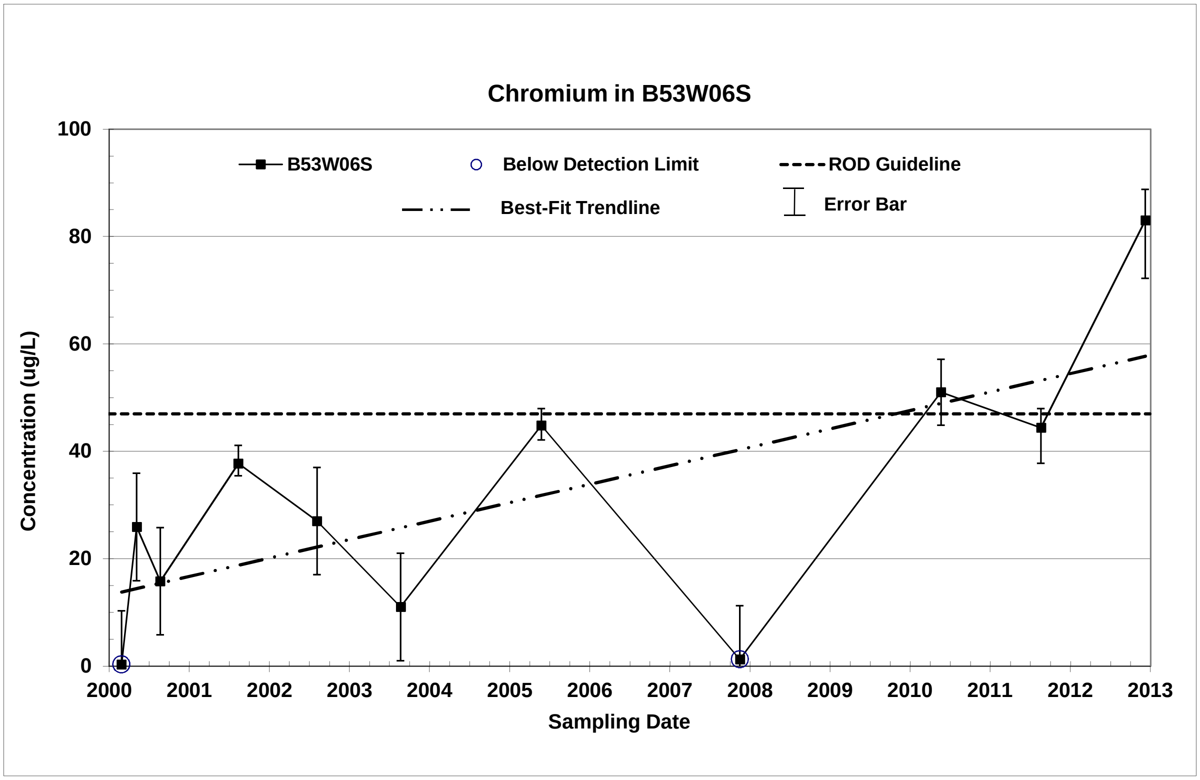


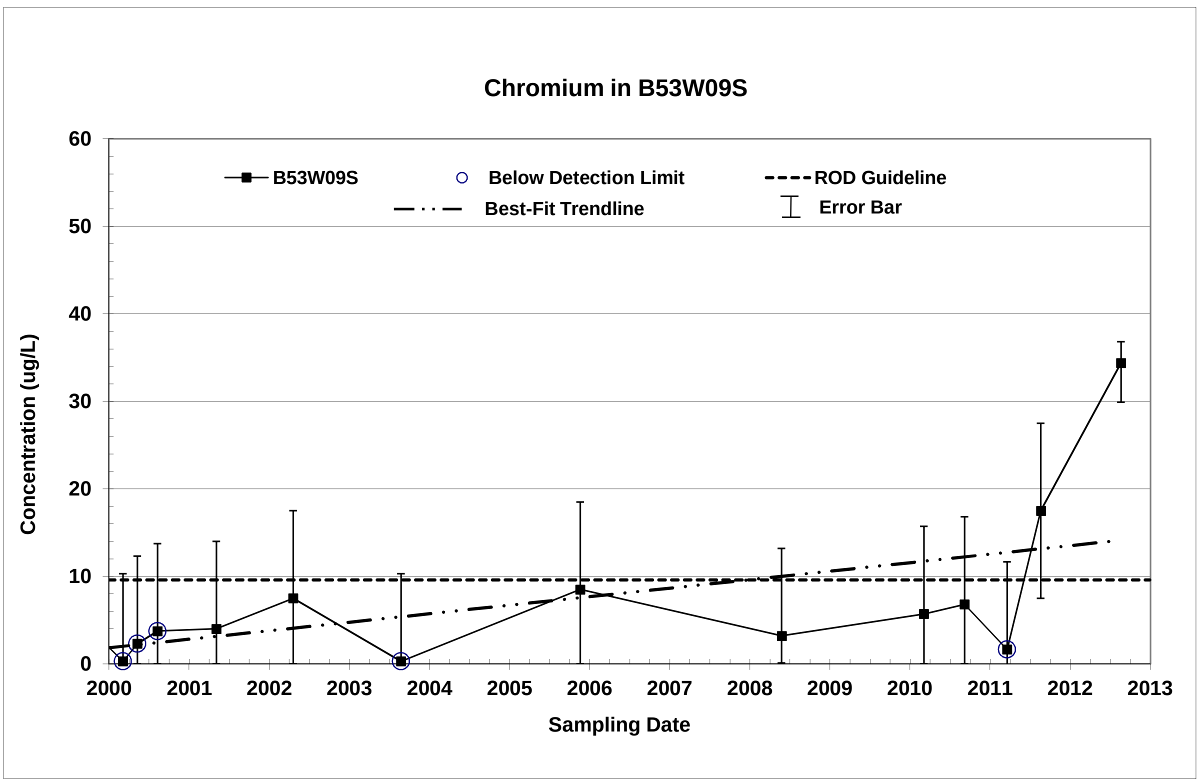
Notes:

For nickel results < 3 times the reporting limit (RL), the error bar represents ± RL. For results exceeding 3 times the RL, the error bar represents the upper and lower control limits on the control spike samples.

For nickel and chromium results reported as nondetect, the value plotted is 1/2 the detection limit.

Figure 4-12. Time-Versus-Concentration Graphs for Chromium and Nickel in Ground Water at B53W13S





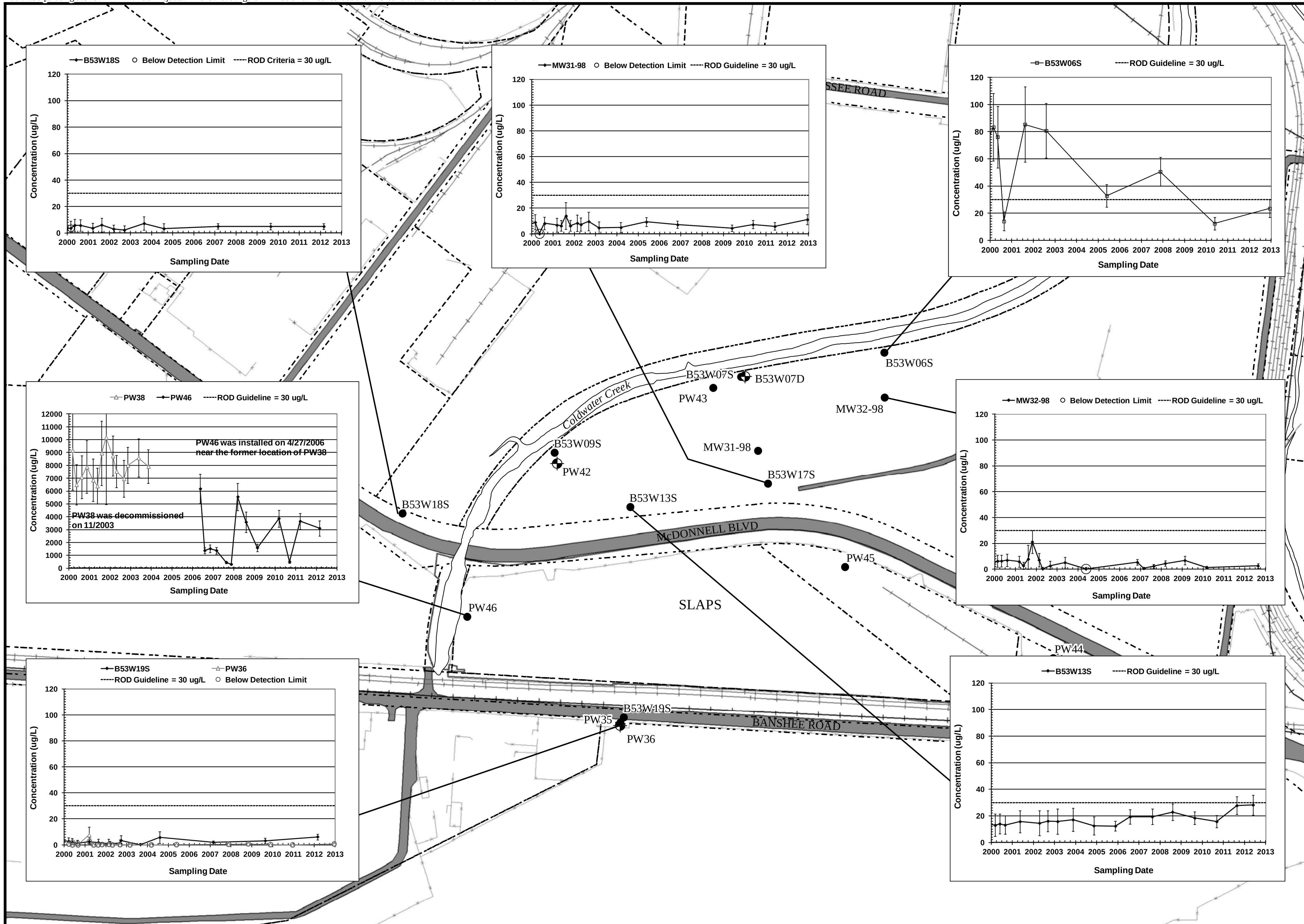
Notes:

For chromium results < 3 times the reporting limit (RL), the error bar represents ± RL. For results exceeding 3 times the RL, the error bar represents the upper and lower control limits on the control spike samples.

For chromium results reported as nondetect, the value plotted is 1/2 the detection limit.

Figure 4-13. Time-Versus-Concentration Graphs for Chromium in Ground Water at B53W06S and B53W09S

Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure 4-14 Selenium Concentrations in Ground Water at the SLAPS and SLAPS VPs.mxd



Legend

- Parcel Boundary
- River/Stream
- Road
- Fence
- Railroad
- Existing HZ-A Monitoring Well
- Existing HZ-C or HZ-E Monitoring Well
- Error Bars

N
W E
S

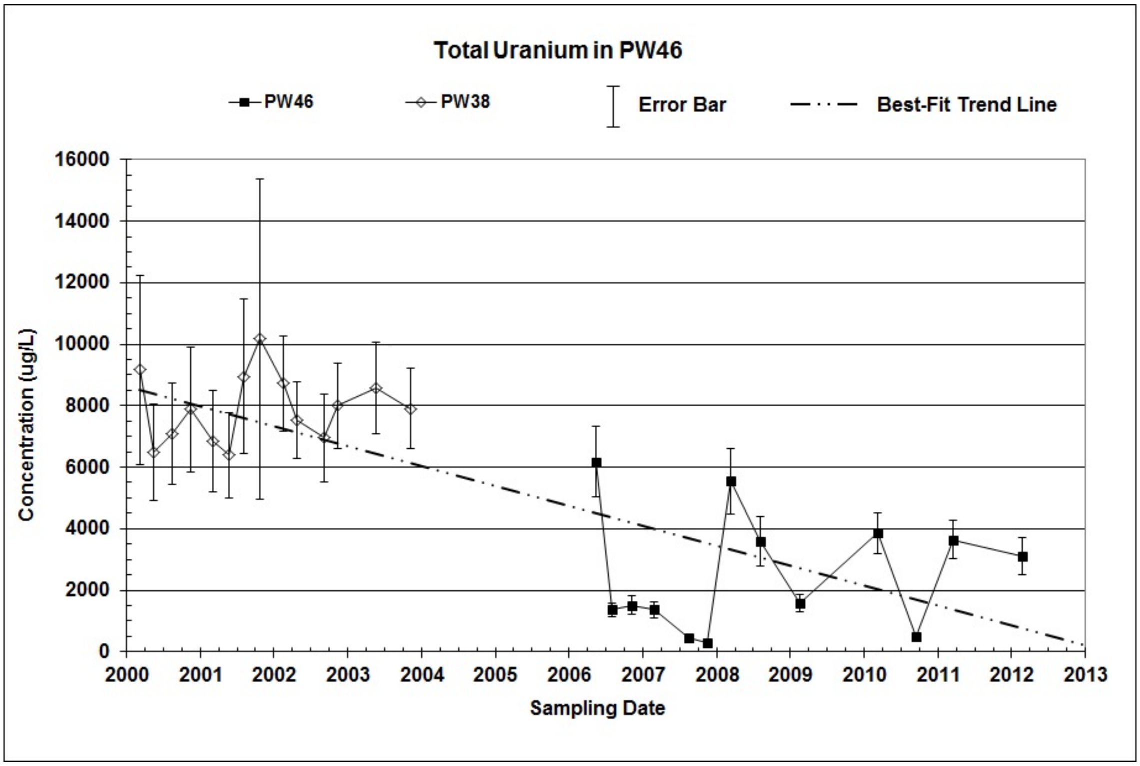
MO-East State Plane
(NAD 83, Feet)

0 195 390 Feet

Figure 4-14. Total Uranium Concentrations in Ground Water at the SLAPS and SLAPS VPs

FUSRAP

DRAWN BY:	REV:	DATE:
KLP	0	6-19-2013



Notes:
For total uranium, the error bar represents ± the sum of the measurement errors for U-234, U-235, and U-238, converted to µg/L.

Figure 4-15. Time-Versus-Concentration Graph for Total U in Ground Water at PW46

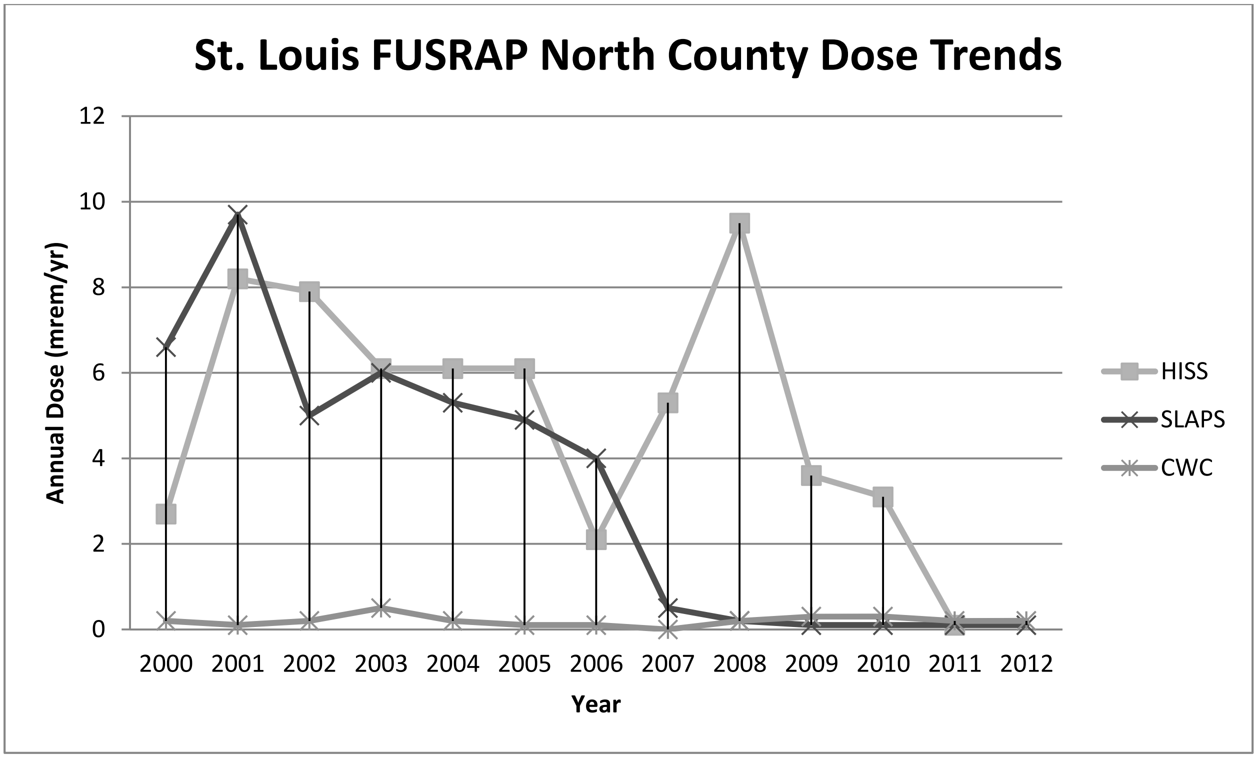


Figure 6-1. St. Louis FUSRAP North County Dose Trends

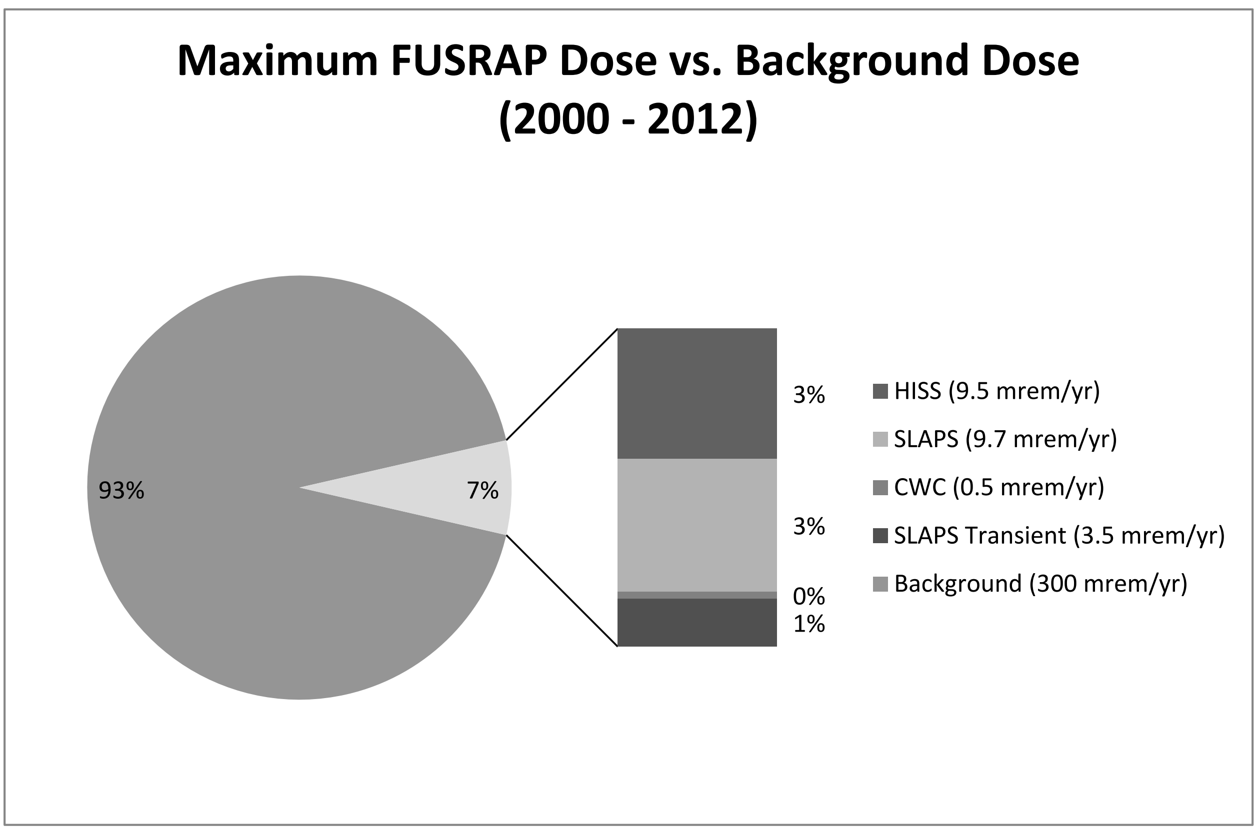


Figure 6-2. St. Louis FUSRAP North County Maximum Dose Vs. Background Dose

APPENDIX A

NORTH ST. LOUIS COUNTY FUSRAP SITES
2012 RADIONUCLIDE EMISSIONS NESHAP REPORT

SUBMITTED IN ACCORDANCE WITH REQUIREMENTS OF 40 *CFR* 61, SUBPART I

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ACRONYMS AND ABBREVIATIONS

$\mu Ci/cm^3$	microcurie per cubic centimeter
µCi/mL	microcurie per milliliter
Ac	actinium
AEC	Atomic Energy Commission
BNI	Bechtal National Inc.
°C	degrees Celsius (centigrade)
CFR	*Code of Federal Regulations*
Ci/yr	curie per year
cm	centimeter
cm^3	cubic centimeter
CY	calendar year
DOE	U.S. Department of Energy
EDE	effective dose equivalent
FS	*Feasibility Study for the St. Louis North County Site*
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
g	gram(s)
GIS	geographic information system
HEPA	high efficiency particulate air
HISS	Hazelwood Interim Storage Site
IA	investigation area
IAAAP	Iowa Army Ammunition Plant
kg	kilogram(s)
m	meter(s)
m^2	square meter
m/min	meters per minute
m^3/min	cubic meter(s) per minute
MED	Manhattan Engineer District
mL	milliliter(s)
mrem/yr	millirem per year
mSv/yr	millisievert(s) per year
NC	North St. Louis County
NESHAP	National Emission Standard for Hazardous Air Pollutants
Pa	protactinium
pCi/g	picocuries per gram
Ra	radium
RA	remedial action
SLAPS	St. Louis Airport Site
SLDS	St. Louis Downtown Site
STLAA	St. Louis Airport Authority
Th	thorium
U	uranium
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VP	vicinity property
yd^3	cubic yards

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EXECUTIVE SUMMARY AND DECLARATION STATEMENT

This report presents the results of National Emission Standard for Hazardous Air Pollutants (NESHAP) calculations for the St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) North St. Louis County (NC) Sites for calendar year (CY) 2012. NESHAP requires the calculation of the effective dose equivalent (EDE) from radionuclide emissions to critical receptors. The report follows the requirements and procedures contained in 40 *Code of Federal Regulation* (*CFR*) 61, Subpart I, *National Emission Standards for Radionuclide Emissions from Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H* (USEPA 1989).

This report evaluates sites at which a reasonable potential exists for radionuclide emissions due to St. Louis FUSRAP activities. These sites include: the St. Louis Airport Site (SLAPS), the Investigation Area (IA)-09 (Ballfields), vicinity property (VP)-16, and the SLAPS Loadout. This report also evaluates radionuclide emissions from the United States Army Corps of Engineers (USACE) radioanalytical laboratory operations. Emissions from the sites and laboratory were evaluated for the entire CY 2012 to provide a conservative estimate of total emissions.

The NESHAP standard of EDE to a critical receptor from radionuclide emissions is 10 millirem per year (mrem/yr) (0.1 millisievert per year [mSv/yr]). None of the sites exceeded this standard. The EDEs from radionuclide emissions at the sites were calculated using soil characterization data, air particulate monitoring data, and the U.S. Environmental Protection Agency (USEPA) CAP88-PC modeling code, which resulted in an EDE of less than 0.1 mrem/yr (<0.001 mSv/yr) from the SLAPS and SLAPS VPs. The EDE from the laboratory emissions was calculated using the methodology in Appendix D of 40 *CFR* 61, *Methods for Estimating Radionuclide Emissions*, soil characterization data, and the USEPA CAP88-PC modeling code (USEPA 2007), which resulted in an EDE of less than 0.1 mrem/yr (<0.001 mSv/yr).

Evaluations for the SLAPS VPs and the USACE radioanalytical laboratory resulted in less than 10 percent of the dose standard in 40 *CFR* 61.102. These sites are exempt from the reporting requirements of 40 *CFR* 61.104(a).

DECLARATION STATEMENT – 40 CFR 61.104(a)(xvi)

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 *U.S. Code* 1001.

________________________________ ____________

Signature Date

Office: U.S. Army Corps of Engineers, St. Louis District Office
Address: 8945 Latty Ave.
Berkeley, MO 63134
Contact: Jon Rankins

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1.0 PURPOSE

This report calculates the EDE from radionuclide emissions (exclusive of radon) to critical receptors from the USACE radioanalytical laboratory and the NC Sites at which a reasonable potential existed for radionuclide emissions due to St. Louis FUSRAP activities. These sites include: the Ballfields, Eva Loadout, and the SLAPS Loadout. The air emissions from the laboratory include fume hood stack releases of particulate radionuclides from sample preparation and separation activities. The air emissions from the other sites are ground releases of particulate radionuclides in soil as a result of windblown action and remedial activity in the form of excavation and off-site disposal of soil.

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2.0 METHOD

Emission rates for the sites were modeled using guidance documents referenced in 40 *CFR* 61, Appendix E, *Compliance Procedures Methods for Determining Compliance with Subpart I* (USEPA 1989), and measured by collection of environmental air samples. Emission rates for the laboratory were modeled using guidance in 40 *CFR* 61 Appendix D, *Methods for Estimating Radionuclide Emissions*. Emission rates were input into the USEPA computer code CAP88-PC, along with appropriate meteorological data and distances to critical receptors[1], to obtain the EDE from the air emissions.

Although 40 *CFR* 61.103 requires the use of the USEPA computer code COMPLY, USEPA no longer supplies technical support for COMPLY. However, the USEPA lists both COMPLY and CAP88-PC as "Atmospheric transport models for assessing dose and risk from radioactive air emissions" (USEPA 2007). The USEPA continues to maintain and update the CAP88-PC modeling program and has updated it as recently as December 9, 2007. In previous FUSRAP NESHAP reports, both COMPLY and CAP88-PC results have been compared. This comparison indicated that CAP88-PC is a comparable and conservative method of demonstrating compliance with 40 *CFR* 61 Subpart I. For these reasons, CAP88-PC was used in this report to demonstrate compliance with the NESHAP standard.

2.1 EMISSION RATE

Two methods were used to determine particulate radionuclide emission rates from the sites: (1) 40 *CFR* 61 Appendix D, *Methods for Estimating Radionuclide Emissions*, and (2) environmental air samples collected from the perimeter of a site. Emissions during excavations and waste loadout were evaluated using air sampling data at the excavation and waste loadout perimeters.

2.2 EFFECTIVE DOSE EQUIVALENT

The EDE to critical receptors[1] is obtained using USEPA computer code CAP88-PC, Version 3.0 (USEPA 2007). CAP88-PC uses a Gaussian plume equation to estimate the dispersion of radionuclides and is referenced by the USEPA to demonstrate compliance with the NESHAP emissions criterion in 40 *CFR* 61. An area ground release at a height of one meter (m) is modeled for the sites, and a stack release was modeled for the laboratory.

The EDE is calculated by combining doses from ingestion, inhalation, air immersion, and external ground surface. CAP88-PC contains historical weather data libraries for major airports across the country, and the results can be modeled for receptors at multiple distances from the emissions source.

[1] "Critical receptors," as used in this report, are the locations for the nearest residence, school, business, and farm.

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3.0 METEOROLOGICAL DATA

Meteorological data was obtained from the CAP88-PC code for the Lambert - St. Louis International Airport (wind file 13994.WND). Data in the file was accumulated from 1988 through 1992.

- Average Annual Wind Velocity: 4.446 m per second
- Average Annual Precipitation Rate: 111 centimeters (cm) per year
- Average Annual Air Temperature: 14.18 degrees Celsius (centigrade) (°C)

Wind speed frequency data was obtained from Lambert - St. Louis International Airport (see Table A.3-1).

Table A.3-1. St. Louis Wind Speed Frequency

Wind Speed Group, Knots[a]	Frequency
0 – 3	0.10
4 – 7	0.29
8 – 12	0.36
13 – 18	0.21
19 – 24	0.03
25 – 31	0.01

[a] knot – 1.151 miles per hour

Wind direction frequency was obtained from the CAP88-PC wind file, 13994.WND (see Table A.3-2).

Table A.3-2. St. Louis Wind Rose Frequency

Wind Direction (wind toward)	Wind From	Wind Frequency	Wind Direction (wind toward)	Wind From	Wind Frequency
N	S	0.131	S	N	0.056
NNW	SSE	0.074	SSE	NNW	0.043
NW	SE	0.068	SE	NW	0.061
WNW	ESE	0.069	ESE	WNW	0.087
W	E	0.055	E	W	0.090
WSW	ENE	0.028	ENE	WSW	0.068
SW	NE	0.031	NE	SW	0.054
SSW	NNE	0.037	NNE	SSW	0.050

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4.0 LATTY AVENUE PROPERTIES UNDER ACTIVE REMEDIATION

4.1 SITE HISTORY

In 1966, Continental Mining and Milling Company of Chicago, Illinois, purchased the wastes stored at the SLAPS and began moving them to a property at 9200 Latty Avenue for storage. In 1967, the Commercial Discount Corporation of Chicago, Illinois, purchased the residues, dried the materials, and shipped much of the material to Canon City, Colorado. Cotter Corporation purchased the remaining residues in 1969 and dried and shipped more material to Canon City during 1970. In 1973, the remaining undried material was shipped to Canon City, and leached barium sulfate was mixed with soil and transported to a St. Louis County landfill. During these activities, improper storage, handling, and transportation of materials caused the spread of materials along haul routes and to the adjacent VPs.

In 1979, the owner of the 9200 Latty Avenue property excavated approximately 13,000 cubic yards (yd^3) from the western half of the property prior to constructing a manufacturing facility. The material excavated at this time was stockpiled on the eastern half of the property, which now constitutes the Hazelwood Interim Storage Site (HISS). In 1984, Bechtel National Inc. (BNI) performed removal actions, including clearing, cleanup, and excavation of the property at 9200 Latty Avenue and the surrounding VPs. This action created approximately 14,000 yd^3 of additional contaminated soil, which was stockpiled on the HISS.

In 1986, the U.S. Department of Energy (DOE) provided radiological support to the cities of Hazelwood and Berkeley for a drainage and road improvement project. Soil with constituents in excess of DOE remedial action (RA) guidelines was excavated and stored at the HISS. This action resulted in an additional 4,600 yd^3 of material being placed at the HISS in a supplemental storage pile.

In 1996, the owner of the property to the east of the HISS, General Investment Funds Real Estate Holding Company, in consultation with the DOE, made commercial parking and drainage improvements on the property. This action resulted in the stockpiling of approximately 8,000 yd^3 of soil and debris in two interim storage piles located in the southwestern portion of the Latty Avenue VP-02(L). These piles were referred to as the Eastern Piles.

In 2000 and 2001, the USACE removed the main, supplemental, and Eastern piles and shipped the material by rail to properly permitted disposal facilities. The ground surface on which the piles were previously located was covered by a layer of plastic and approximately 6 inches of gravel.

4.2 MATERIAL HANDLING AND PROCESSING FOR CALENDAR YEAR 2012

Soil cleanup activities at the HISS and the Futura Coatings Company (Futura), which were the Latty Avenue Properties with the highest initial levels of residual contamination, were completed in CY 2011. No excavation or loadout activities for the Latty Avenue Properties occurred in CY 2012; therefore, radioactive particulate emissions were considered negligible, air sampling for particulate radionuclides was not conducted, and NESHAP calculations for these properties were not required.

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5.0 ST. LOUIS AIRPORT SITE AND ST. LOUIS AIRPORT SITE VICINITY PROPERTIES UNDER ACTIVE REMEDIATION

5.1 SITE HISTORY

The Manhattan Engineer District (MED) acquired the SLAPS in 1946 to store uranium-bearing residuals generated at the St. Louis Downtown Site (SLDS) from 1946 until 1966. In 1966, these residuals were purchased by Continental Mining and Milling Company of Chicago, removed from the SLAPS, and placed in storage at the Latty Avenue HISS under an Atomic Energy Commission (AEC) license. After most of the residuals were removed, site structures were demolished and buried on the property, along with approximately 60 truckloads of scrap metal and a vehicle that had become contaminated. In 1973, the U.S. Government and the City of St. Louis agreed to transfer ownership from the AEC to the St. Louis Airport Authority (STLAA). The USACE conducted cleanup operations on the SLAPS from 1998 to 2007. Although excavations have concluded at the SLAPS, a small portion of the site is still used to conduct waste storage and loadout activities.

5.2 MATERIAL HANDLING AND PROCESSING FOR CALENDAR YEAR 2012

During CY 2012, excavations were conducted on the Ballfields, Frost Avenue ROW, and Eva Loadout, and waste loadout activities were conducted at the SLAPS Loadout facility. For the purposes of this evaluation, the excavation at Frost Avenue ROW is included with the Eva Loadout excavation. Air particulate samples were collected around excavation perimeters during active excavation on the SLAPS VPs and around the SLAPS Loadout area throughout CY 2012. Analytical results of air particulate samples were used to determine windblown *in situ* emissions.

5.3 SOURCE DESCRIPTION – RADIONUCLIDE SOIL CONCENTRATIONS

The radionuclide concentrations for each site were obtained from data contained in Table D-5 of the *Feasibility Study for the St. Louis North County Site* (FS) (USACE 2003). Attachment A-1 contains a summary table of the radionuclide concentrations used to calculate the emission rate from the site.

5.4 LIST OF ASSUMED AIR RELEASES FOR CALENDAR YEAR 2012

Ground releases of particulate radionuclides in soil, as a result of windblown action and remedial activity in the form of excavation and off-site disposal of soil, are assumed for the particulate radionuclide emission determinations from the SLAPS VPs at which excavations occurred in CY 2012. Other SLAPS VPs do not contribute to the emission determinations for periods of inactivity due to the low activity and vegetative cover.

5.5 DISTANCES TO CRITICAL RECEPTORS

The distances to critical receptors are shown on Figure A-2 and presented in Table A.5-1. Distances and directions to critical receptors are determined by using tools in a geographic information system (GIS).

Table A.5-1. SLAPS Critical Receptors for CY 2012

Sources	Resident		Farm		Business		School	
	Dist.[a]	Dir.[a]	Dist.[a]	Dir.[a]	Dist.[a,b]	Dir.[a]	Dist.[a]	Dir.[a]
Ballfields	490	NE	1,485	NE	775	WSW	2,265	E
Eva Loadout	425	N	1,425	NNE	1060	W	1,915	W
SLAPS Loadout	770	NE	1,710	NE	500	WSW	2,580	E

[a] Dist. – Distance in m; Dir. – Direction.
[b] Distance from business receptor to fenceline is 160 m. Distance from business receptor to center of source from the SLAPS Loadout is 500 m for emissions determination.

5.6 EMISSIONS DETERMINATION

5.6.1 Measured Airborne Radioactive Particulate Emissions

Particulate air samples were collected from four locations around the perimeter of the SLAPS Loadout to measure the radionuclide emissions. The samples provide the basis for determining the radionuclide emission rates during all of CY 2012. The average gross alpha and gross beta concentrations in microcuries per milliliter (μCi/mL) are determined for each sample location for CY 2012. The site average concentrations are presented in Table A.5-2.

Table A.5-2. SLAPS Average Gross Alpha and Beta Airborne Particulate Emissions for CY 2012

Monitoring Location	Average Concentration (μCi/mL)	
	Gross Alpha	Gross Beta
Ballfields	3.55E-15	2.84E-14
Eva Loadout	5.43E-15	3.10E-14
SLAPS Loadout	3.77E-15	2.77E-14
Background Concentration[a]	4.24E-15	2.05E-14

[a] These concentrations are provided only for informational purposes. As a conservative approach, background values were not subtracted from the gross average concentration during the determination of EDE.

Radionuclide activity fractions are determined for alpha and beta from the average radionuclide concentration data contained in Table D-5 of the FS (USACE 2003). The product of each radionuclide activity fraction and the gross concentration provide the radionuclide emission concentration as measured in microcuries per cubic centimeters (μCi/cm^3). The gross average concentration (in μCi/cm^3) is converted to a release (emission) rate (in curies per year [Ci/yr]) using Equations (1) and (2). The emission rates are summarized in Table A.5-5.

USEPA 1989 (page 3-21, [2]) includes Equation (1) for determination of the effective diameter of a non-circular stack or vent.

$$D = (1.3\ A)^{1/2} \qquad \textbf{Equation (1)}$$

where:

D is the effective diameter of the release (m), and
A is the area of the stack, vent, or release point (square meters [m^2]).

Table A.5-3 provides the effective surface area available for release of airborne radionuclides normalized to one year and the effective diameter for the SLAPS and SLAPS VPs that were excavated in CY 2012. Calculation of the effective surface area can be referenced in Attachment A-1.

Table A.5-3. SLAPS/SLAPS VPs Excavation Effective Areas and Effective Diameters for CY 2012

Location	Effective Area (m^2)	Effective Diameters (m)
Ballfields	1,081	37
Eva Loadout	43	7
SLAPS Loadout	600	28

The average annual wind speed for the Lambert - St. Louis International Airport is provided in CAP88-PC as 4.446 m per second. Conversion of this wind speed to a flow rate through stacks with the listed effective diameters for each area is completed using Equation (2).

$$V = (4)\ F\ /\ \pi\ (D)^2 \qquad \textbf{Equation (2)}$$

where:

- V is the wind velocity (in meters per minute [m/min]) = 266.76 m/min,
- F is the flow rate (in cubic meters per minute [m^3/min]),
- π is a mathematical constant, and
- D is the effective diameter of the release determined using Equation (1) above (m).

Converting the velocity of emissions from the sites to an effective flow rate results in the following site release flow rates for the SLAPS and SLAPS VPs areas as listed in Table A.5-4. The product of the flow rate, the activity fraction associated with each radionuclide, and the appropriate conversion factors provide the site emission rate for each radionuclide as illustrated in Table A.5-5. Attachment A-1 can be referenced for flow rate and average radionuclide concentration data.

Table A.5-4. SLAPS/SLAPS VPs Site Release Flow Rates for CY 2012

Location	Site Release Flow Rate (m^3/min)
Ballfields	2.9E+05
Eva Loadout	1.2E+04
SLAPS Loadout	1.6E+05

5.6.2 St. Louis Airport Site and St. Louis Airport Site Vicinity Properties Total Airborne Radioactive Particulate Emission Rates

The SLAPS and SLAPS VPs' total CY 2012 emission/release rates that were input into the USEPA codes are shown in Table A.5-5 and are based on the measured emission rates from the air samples collected from the perimeter of the site or excavations as appropriate.

Table A.5-5. SLAPS/SLAPS VPs Total Airborne Radioactive Particulate Emission Rates for CY 2012

Radionuclide	Emission (Ci/yr)[a]		
	Ballfields	Eva Loadout	SLAPS Loadout
U-238	2.6E-05	3.9E-07	1.5E-05
U-235	3.5E-06	1.7E-08	2.0E-06
U-234	2.6E-05	3.9E-07	1.5E-05
Ra-226	1.3E-05	2.3E-07	7.3E-06
Th-232	6.7E-06	3.3E-08	3.8E-06
Th-230	4.1E-04	3.3E-05	2.4E-04
Th-228	6.1E-06	3.3E-08	3.5E-06

Table A.5-5. SLAPS/SLAPS VPs Total Airborne Radioactive Particulate Emission Rates for CY 2012 (Continued)

Radionuclide	Emission (Ci/yr)[a]		
	Ballfields	Eva Loadout	SLAPS Loadout
Ra-224	6.1E-06	3.3E-08	3.5E-06
Th-234	1.8E-03	9.3E-05	9.6E-04
Pa-234m	1.8E-03	9.3E-05	9.6E-04
Th-231	2.4E-04	4.0E-06	1.3E-04
Ra-228	2.7E-04	2.8E-06	1.4E-04
Ac-228	2.7E-04	2.8E-06	1.4E-04
Pa-231	2.4E-05	2.6E-07	1.3E-05
Ac-227	2.1E-05	2.3E-07	1.2E-05

[a] Release rate based on a 366-day period at a respective flow rate (as presented in Table A.5-4) as determined from the average annual wind speed (4.446 m per second) and the effective site area (as presented in Table A.5-3) for each location.

Ac – actinium; Pa – protactinium; Ra – radium; Th – thorium; U – uranium

5.7 CAP88-PC RESULTS

The CAP88-PC report is contained in Attachment A-2. The effective area factor input was taken from Table A.5-3. Results show compliance with the 10 mrem/yr (0.1 mSv/yr) criterion for all critical receptors. Table A.5-6 summarizes the results.

Table A.5-6. SLAPS/SLAPS VPs CAP88-PC Results for Critical Receptors for CY 2012

Source	Dose (mrem/yr)			
	Resident[a]	School[b]	Business[b]	Farm[a]
Ballfields	<0.1	<0.1	<0.1	<0.1
Eva Loadout	<0.1	<0.1	<0.1	<0.1
SLAPS Loadout[c]	<0.1	<0.1	<0.1	<0.1
SLAPS/SLAPS VPs	<0.1	<0.1	<0.1	<0.1

[a] Occupancy factor is 100 percent for resident and farm.

[b] Corrected for the 23 percent occupancy factor (50 weeks per year, 40 hours per week).

[c] Distance from business receptor to fenceline is 160 m. Distance from business receptor to center of source is 500 m for emissions determination.

6.0 U.S. ARMY CORPS OF ENGINEERS RADIOANALYTICAL LABORATORY

6.1 SITE DESCRIPTION

The USACE radioanalytical laboratory is located on VP-38. VP-38 is a SLAPS VP owned by SuperValue Inc. The USACE radioanalytical laboratory is bounded on the north, east, and west by SuperValue Inc. property and on the south by Latty Avenue. The laboratory site covers approximately 1 acre of VP-38.

6.2 LIST OF ASSUMED AIR RELEASES FOR CALENDAR YEAR 2012

Emissions from USACE radioanalytical laboratory operations are assumed for the particulate radionuclide emission determinations from the laboratory site. No active excavations occurred on VP-38 during CY 2012.

6.3 EFFLUENT CONTROLS

The effluent controls at the USACE radioanalytical laboratory during operations include performing all radioanalytical activities in fume hoods that exhaust to the outside air after passing through a high efficiency particulate air (HEPA) filter.

6.4 DISTANCES TO CRITICAL RECEPTORS

The distances to critical receptors are shown on Figure A-2 and listed in Table A.6-1. Distances and directions to critical receptors are determined by using tools in a GIS.

Table A.6-1. Laboratory Critical Receptors for CY 2012

Receptor	Distance (m)	Direction from Site
Nearest Resident	330	NE
School	1,830	SE
Business	110	S
Farm	310	NE

6.5 EMISSIONS DETERMINATIONS

6.5.1 Stack Emissions from U.S. Army Corps of Engineers Laboratory Operations

Two potential sources of emissions from laboratory operations exist:

1. The drying and grinding operations for soil samples, and
2. The dissolution of soil and water samples.

To obtain an estimate of the emissions that these operations can cause, the methodology in Appendix D of 40 *CFR* 61, *Methods for Estimating Radionuclide Emissions,* was utilized. For the drying and grinding operations, a factor of 0.001 (applicable to liquids and powders) was applied to the entire annual laboratory inventory to determine the emissions for the year. For the dissolution operation; however, only 5 grams (g) of any sample are used. Because the dissolution involved heating samples to near boiling temperatures, no adjustment was made to the dissolution inventory to determine the emissions (a factor of 1.0 as specified in Appendix D). To account for the small aliquot utilized, the annual inventory was adjusted by a factor of 0.005 (the ratio of the 5-g aliquot to the 1-kilogram [kg] sample mass) to estimate emissions. The two emission sources were then summed to determine the total laboratory source term.

Note that no credit is taken for emission controls serving the drying and grinding operations, even though Appendix D of 40 *CFR* 61 allows for credit to be taken for the HEPA filters installed on the grinder equipment. The calculated source term therefore provides a conservative basis on which to determine compliance with USEPA guidance in 40 *CFR* 61.

To determine whether the laboratory complies with the 10 mrem/yr (0.1 mSv/yr) limit specified in 40 *CFR* 61, Subpart I, the annual inventory handled by the laboratory had to be determined. The actual number of samples handled by the laboratory was reported as shown in Table A.6-2. With this data, the following equation was used to calculate laboratory emissions from the operations conducted in CY 2012.

$$Emission\ Rate\,(Ci/yr) = C * \left\lfloor N_1 * F_1 + N_2 * F_2 \right\rfloor * 1{,}000\ grams/sample\ *\ 1E-12\,(curies\ per\ picocuries)$$

where:

- C = the concentration of a radionuclide of concern in a sample type (picocuries per gram [pCi/g])
- N_1 = the number of samples involved in drying/grinding operation
- N_2 = the number of samples involved in separations operation
- F = the appropriate correction factor (i.e., 0.001 for drying/grinding [F_1] or 0.005 for dissolution [F_2])

Table A.6-2. Laboratory Annual Sample Inventory for CY 2012

Site	Type	Gamma	IsoRa[a]	IsoTh[a]	IsoU[a]	Total Drying and Grinding[b]	Total Separations[c]
HISS	soil	21	0	13	0	21	13
HISS	water	0	10	10	10	0	30
Latty Avenue Properties	soil	505	0	504	0	505	504
Latty Avenue Properties	water	0	0	0	0	0	0
IAAAP	soil	0	0	0	0	0	0
IAAAP	water	0	0	0	0	0	0
SLAPS	soil	11	0	11	0	11	11
SLAPS	water	0	11	11	11	0	33
SLAPS VPs	soil	2,545	0	2,328	0	2,545	2,328
SLAPS VPs	water	5	28	28	0	5	56
Coldwater Creek	sediment (soil)	665	0	661	0	665	661
Coldwater Creek	water	0	14	14	14	0	42
SLDS	soil	685	0	652	0	685	652
SLDS	water	0	45	45	8	0	98
		HISS and Latty Avenue Properties			**Total**	526	547
		IAAAP			**Total**	0	0
		SLAPS, SLAPS VPs, and Coldwater Creek			**Total**	3,221	3,131
		SLDS			**Total**	685	750

[a] Assumes isotopic radium, thorium, and uranium occur in separate and distinct processes.
[b] Assumes all soil samples went through a drying/grinding process.
[c] Assumes all soil and water samples for isotopic radium, thorium, and uranium went through a separations process.

Notes:
Coldwater Creek samples use SLAPS characterization data to determine release rates.
Gamma – Gamma Spectroscopy; IAAAP – Iowa Army Ammunition Plant; IsoRa – Isotopic Radium; IsoTh – Isotopic Thorium; IsoU – Isotopic Uranium.

6.5.2 Laboratory Total Airborne Radioactive Particulate Emission Rates

The laboratory total CY 2012 emission rate was input into the USEPA CAP88-PC code. The total emission rates are shown in Table A.6-3 as the calculated emissions from laboratory operations. The result was then used to calculate total dose to the hypothetical maximally exposed receptor. Calculation of emission rates can be referenced in Attachment A-1.

Table A.6-3. Laboratory Total Airborne Radioactive Particulate Emission Rates for CY 2012

Radionuclide	Emission (Ci/yr)[a]
U-238	4.7E-07
U-235	2.8E-08
U-234	4.7E-07
Ra-226	1.6E-07
Th-232	4.4E-08
Th-230	1.5E-06
Th-228	3.9E-08
Ra-224	3.9E-08
Th-234	4.7E-07
Pa-234m	4.7E-07
Th-231	2.8E-08
Ra-228	3.2E-08
Ac-228	3.2E-08
Pa-231	1.2E-07
Ac-227	1.0E-07

[a] Total emission rate is the sum of individual emission rates that were determined by using the calculation in Section 6.5.1.

6.6 CAP88-PC RESULTS

The CAP88-PC report is contained in Attachment A-2. The stack factor input was 3 m high and 0.3 m in diameter. This evaluation demonstrates that all USACE radioanalytical laboratory critical receptors receive less than 10 percent of the dose standard in 40 *CFR* 61.102, and therefore, the laboratory is exempt from the reporting requirement of 40 *CFR* 61.104(a). Table A.6-4 summarizes the results.

Table A.6-4. Laboratory CAP88-PC Results for Critical Receptors for CY 2012

Receptor	Distance (m)	Direction from Site	Dose (mrem/yr)
Nearest Resident[a]	330	NE	<0.1
School[b]	1,830	SE	<0.1
Business[b]	110	S	<0.1
Farm[a]	310	NE	<0.1

[a] Occupancy factor is 100 percent for resident and farm.
[b] Corrected for the 23 percent occupancy factor (50 weeks per year; 40 hours per week).

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7.0 REFERENCES

USACE 2003. U.S. Army Corps of Engineers, St. Louis District Office. *Feasibility Study for the St. Louis North County Site*. Final. May.

USACE 2012. *North St. Louis County Sites Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2011*, St. Louis Missouri, Revision 0, July 13, 2012.

USACE 2013. *St. Louis Downtown Site Annual Environmental Monitoring Data and Analysis Report for Calendar Year 2012*, St. Louis Missouri, Revision A, May 3, 2013.

USEPA 1989. U.S. Environmental Protection Agency, Office of Radiation Programs, Washington, D.C. *A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclide Emissions From NRC-Licensed and Non-DOE Federal Facilities*. EPA 520/1-89-002. October.

USEPA 2007. CAP88-PC Version 3.0 Computer Code, U.S. Environmental Protection Agency. December.

40 *CFR* 61, Subpart I. *National Emission Standards for Radionuclide Emissions From Federal Facilities Other Than Nuclear Regulatory Commission Licensees and Not Covered by Subpart H*.

40 *CFR* 61 Appendix D. *Method for Estimating Radionuclide Emissions.*

40 *CFR* 61 Appendix E. *Compliance Procedures Methods for Determining Compliance with Subpart I*.

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APPENDIX A

FIGURES

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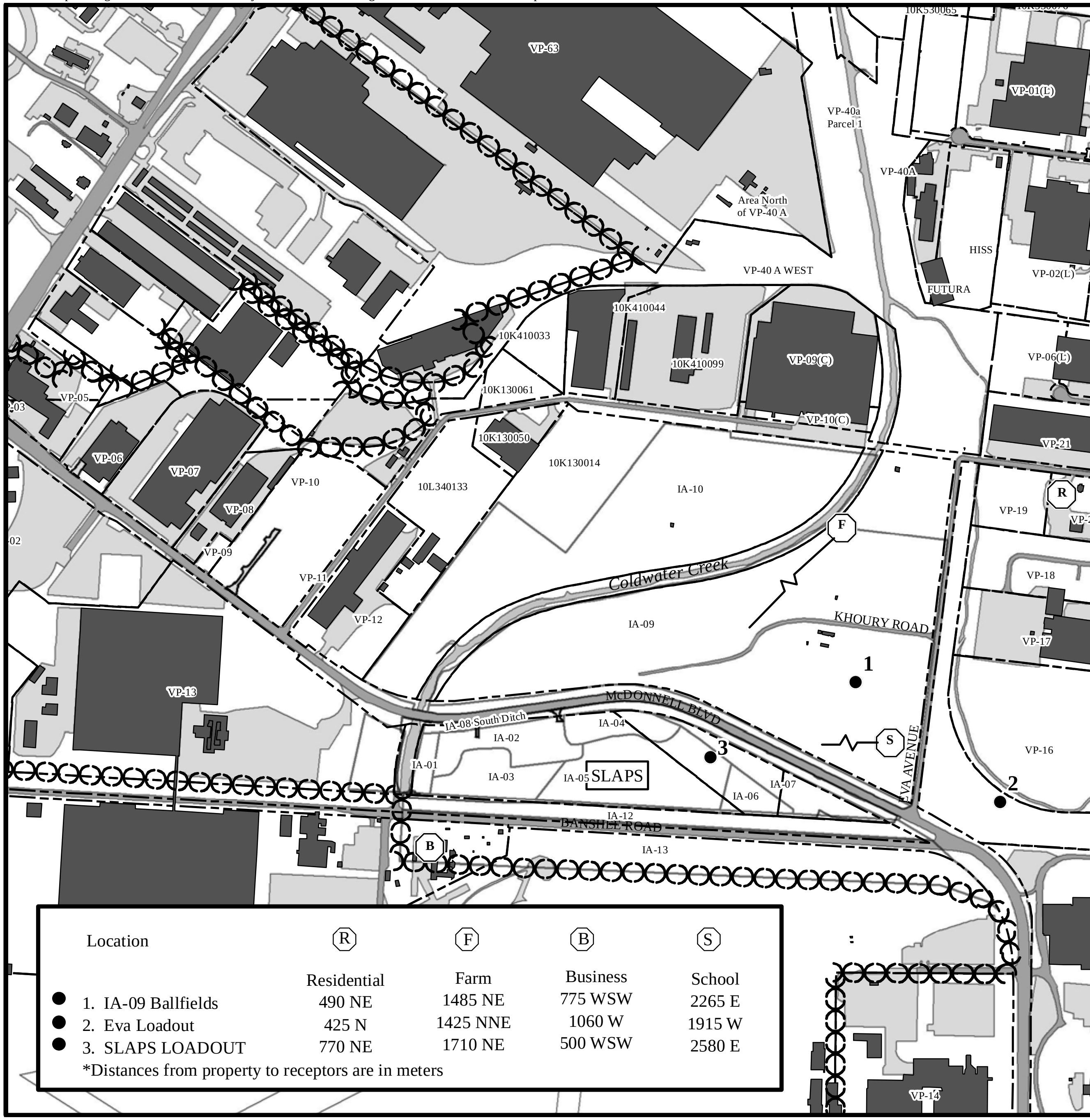

LEGEND:

- Parcel Boundaries
- ROD Boundary
- Buildings
- Parking Lots
- Road
- River/Stream

N W E S

MO-East State Plane
(NAD 83, Feet)

0 115 230 Meters

Location	R Residential	F Farm	B Business	S School
1. IA-09 Ballfields	490 NE	1485 NE	775 WSW	2265 E
2. Eva Loadout	425 N	1425 NNE	1060 W	1915 W
3. SLAPS LOADOUT	770 NE	1710 NE	500 WSW	2580 E

*Distances from property to receptors are in meters

Figure A-1.
SLAPS and SLAPS VPs
Critical Receptors

FUSRAP

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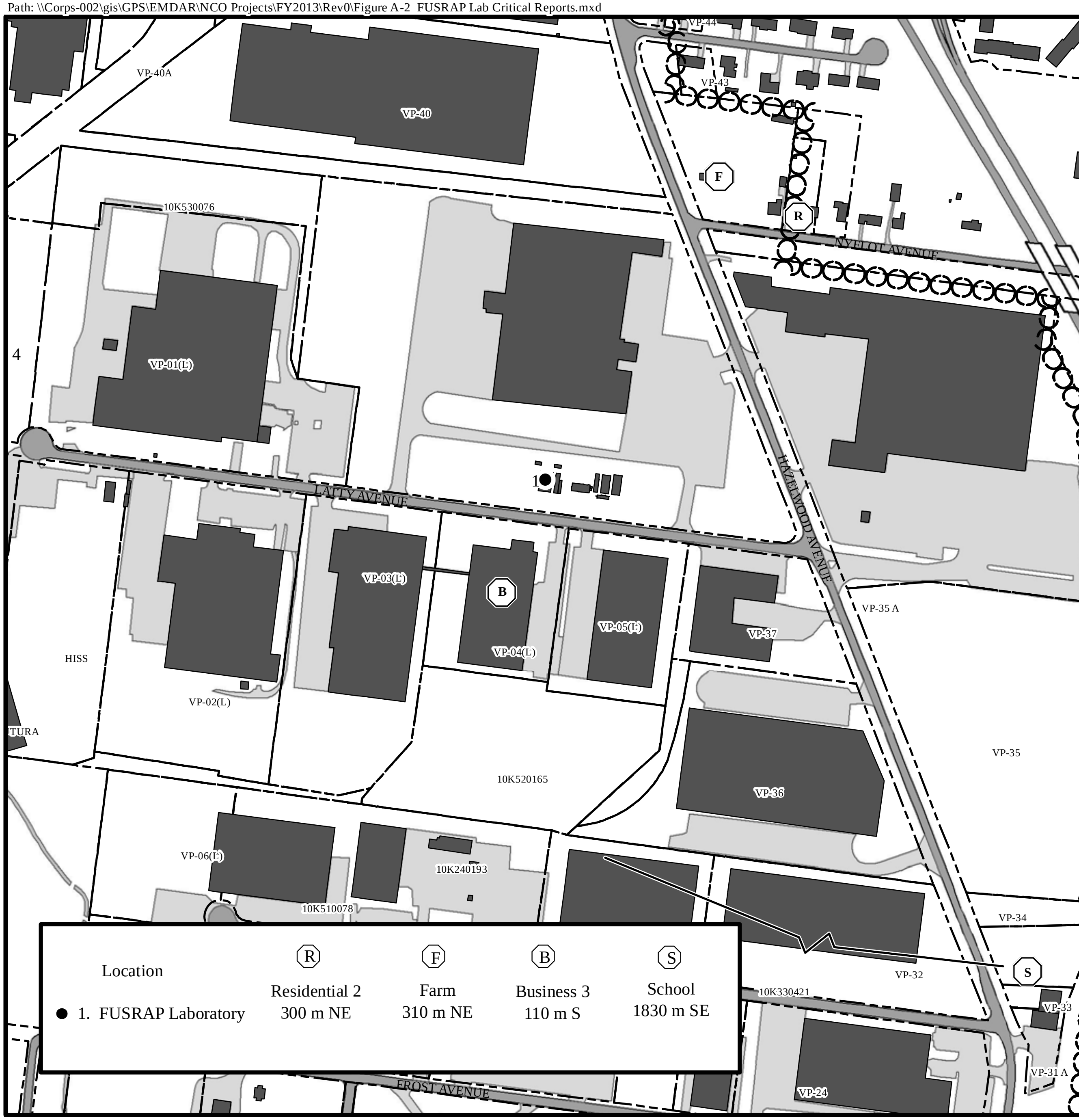
Path: \\Corps-002\gis\GPS\EMDAR\NCO Projects\FY2013\Rev0\Figure A-2 FUSRAP Lab Critical Reports.mxd



Location	R Residential 2	F Farm	B Business 3	S School
● 1. FUSRAP Laboratory	300 m NE	310 m NE	110 m S	1830 m SE

LEGEND:

- ROD Boundary
- Buildings
- Parcel Boundaries
- Parking Lots
- Road
- River/Stream

N
W E
S

MO-East State Plane
(NAD 83, Feet)

0 75 150 Meters

Figure A-2.
FUSRAP
Laboratory Critical Receptors

FUSRAP

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ATTACHMENT A-1

CALCULATED EMISSION RATES FROM NORTH ST. LOUIS COUNTY SITES PROPERTIES

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Table A1-1. SLAPS Properties Soil Radionuclide Concentrations for CY 2012

Property	Ballfields	Eva Loadout	SLAPS Loadout
Radionuclide	Average Concentration (pCi/g)[a]		
U-238	6.6	0.1	3.3
U-235	0.9	0.003	0.4
U-234	6.6	0.06	3.3
Ra-226	3.3	0.03	1.7
Ra-228	1.0	0.002	0.5
Th-232	1.7	0.005	0.9
Th-230	105	5.0	55
Th-228	1.6	0.005	0.8
Pa-231	6.1	0.04	3.0
Ac-227	5.3	0.03	2.7

[a] Radionuclides and concentrations from the FS, Appendix D, Attachment 5 (USACE 2003).

Table A1-2. SLAPS Properties Average Gross Alpha and Beta Airborne Particulate Emissions for CY 2012

Location	Average Concentration (μCi/mL) for Location[a]	
	Gross Alpha	Gross Beta
Ballfields	3.55E-15	2.84E-14
Eva Loadout	5.43E-15	3.10E-14
SLAPS Loadout	3.77E-15	2.77E-14
Background Concentration[b]	4.24E-15	2.05E-14

[a] Average concentration values for the sampling period by location.
[b] Negative gross alpha values were less than the laboratory instrument background value and were reported as zero.

Table A1-3. SLAPS Properties Excavation Data for CY 2012

Location	Area (m^2)	Excavation Start Date	Excavation End Date
Ballfields - Phase 1 - SU1D[a]	306	01/01/12	01/03/12
Ballfields - Phase 1 - SU1E[a]	262	01/01/12	02/01/12
Ballfields - Phase 1 - SU1F[a]	370	01/01/12	02/01/12
Ballfields - Phase 1 - SU2A	256	01/17/12	02/16/12
Ballfields - Phase 1 - SU2B	333	02/06/12	02/28/12
Ballfields - Phase 1 - SU2C	556	02/13/12	02/29/12
Ballfields - Phase 1 - SU2D	443	02/22/12	03/28/12
Ballfields - Phase 1 - SU2E	186	02/23/12	03/20/12
Ballfields - Phase 1 - SU2F	97	02/29/12	03/13/12
Ballfields - Phase 1 - SU2G	99	03/07/12	03/15/12
Ballfields - Phase 1 - SU2H	680	02/23/12	04/16/12
Ballfields - Phase 1 - SU2I	138	03/01/12	03/21/12
Ballfields - Phase 1 - SU2J	731	03/21/12	05/23/12
Ballfields - Phase 1 - SU2K	2.93	03/28/12	04/04/12
Ballfields - Phase 1 - SU2L	941	04/02/12	04/30/12
Ballfields - Phase 1 - SU2M	557	04/12/12	05/31/12
Ballfields - Phase 1 - SU2N	254	05/14/12	05/31/12
Ballfields - Phase 1 - SU2O	117	05/17/12	06/05/12

Table A1-3. SLAPS Properties Excavation Data for CY 2012 (Continued)

Location	Area (m^2)	Excavation Start Date	Excavation End Date
Ballfields - Phase 1 - SU3A	647	03/13/12	03/28/12
Ballfields - Phase 1 - SU3B	471	03/22/12	04/23/12
Ballfields - Phase 1 - SU3C	541	03/29/12	04/16/12
Ballfields - Phase 1 - SU3D	539	06/11/12	06/25/12
Ballfields - Phase 1 - SU3E	473	06/18/12	07/03/12
Ballfields - Phase 1 - SU3F	417	06/25/12	07/09/12
Ballfields - Phase 1 - SU3G	226	07/16/12	07/25/12
Ballfields - Phase 1 - Pole 1	21	04/18/12	04/18/12
Ballfields - Phase 1 - Pole 2	23	04/19/12	04/19/12
Ballfields - Phase 1 - Pole 3	18	04/23/12	04/24/12
Ballfields - Phase 1 - Pole 4	29	04/24/12	04/24/12
Ballfields - Phase 1 - Pole 5A	42	04/25/12	04/25/12
Ballfields - Phase 1 - Pole 5B	38	05/03/12	05/09/12
Ballfields - Phase 1 - Pole 5C	19	05/14/12	05/15/12
Ballfields - Phase 2 - SU-6A	382	06/27/12	07/24/12
Ballfields - Phase 2 - SU-6B	413	07/05/12	08/14/12
Ballfields - Phase 2 - SU-6C	493	07/23/12	08/06/12
Ballfields - Phase 2 - SU-6D	737	07/31/12	08/30/12
Ballfields - Phase 2 - SU-7A	558	08/07/12	09/18/12
Ballfields - Phase 2 - SU-7B	50	08/28/12	09/10/12
Ballfields - Phase 2 - SU-7C	378	08/29/12	10/17/12
Ballfields - Phase 2 - SU-7D	173	10/04/12	10/31/12
Ballfields - Phase 2 - SU-8A	303	11/06/12	11/26/12
Ballfields - Phase 2 - SU-8B[a]	347	12/19/12	12/31/12
Eva Loadout SU-1A	70	09/10/12	10/10/12
Eva Loadout SU-1B	69	09/19/12	10/23/12
Eva Loadout SU-1C	58	10/01/12	10/23/12
Eva Loadout SU-1D	87	10/16/12	11/13/12
Eva Loadout SU-1E	99	10/29/12	11/13/12
Eva Loadout SU-1F	80	11/05/12	12/04/12
Eva Loadout SU-1G	12	11/27/12	12/11/12
Eva Loadout SU-1H[a]	30	12/04/12	12/31/12
Eva Loadout SU-1I	61	12/05/12	12/26/12
Eva Loadout SU-1J[a]	2	12/12/12	12/31/12
Frost Avenue ROW SU-1	44	01/09/12	01/26/12

[a] Open/close dates set to start or stop at the calendar year boundary.

Table A1-4. SLAPS Properties Average Surface Area and Flow Rate per Location for CY 2012

Location	Total Days	Surface Area * Total Days	Average Surface Area/year (m^2)	Diameter of Stack $D=(1.3*A)^{1/2}$(m)	Flow Rate $F=V*Pi*(D)^2/4$ (m^3/min.)
Ballfields					
Ballfields - Phase 1 - SU1D	3	919			
Ballfields - Phase 1 - SU1E	32	8,387			
Ballfields - Phase 1 - SU1F	32	11,835			
Ballfields - Phase 1 - SU2A	31	7,941			
Ballfields - Phase 1 - SU2B	23	7,649			
Ballfields - Phase 1 - SU2C	17	9,458			
Ballfields - Phase 1 - SU2D	36	15,952			
Ballfields - Phase 1 - SU2E	27	5,011			
Ballfields - Phase 1 - SU2F	14	1,355			
Ballfields - Phase 1 - SU2G	9	893			
Ballfields - Phase 1 - SU2H	54	36,697			
Ballfields - Phase 1 - SU2I	21	2,899			
Ballfields - Phase 1 - SU2J	64	46,796			
Ballfields - Phase 1 - SU2K	8	23			
Ballfields - Phase 1 - SU2L	29	27,287			
Ballfields - Phase 1 - SU2M	50	27,842			
Ballfields - Phase 1 - SU2N	18	4,564			
Ballfields - Phase 1 - SU2O	20	2,334			
Ballfields - Phase 1 - SU3A	16	10,347			
Ballfields - Phase 1 - SU3B	33	15,543			
Ballfields - Phase 1 - SU3C	19	10,288			
Ballfields - Phase 1 - SU3D	15	8,080			
Ballfields - Phase 1 - SU3E	16	7,563			
Ballfields - Phase 1 - SU3F	15	6,258			
Ballfields - Phase 1 - SU3G	10	2,263			
Ballfields - Phase 1 - Pole 1	1	21			
Ballfields - Phase 1 - Pole 2	1	23			
Ballfields - Phase 1 - Pole 3	2	35			
Ballfields - Phase 1 - Pole 4	1	29			
Ballfields - Phase 1 - Pole 5A	1	42			
Ballfields - Phase 1 - Pole 5B	7	269			
Ballfields - Phase 1 - Pole 5C	2	38			
Ballfields - Phase 2 - SU-6A	28	10,688			
Ballfields - Phase 2 - SU-6B	41	16,933			
Ballfields - Phase 2 - SU-6C	15	7,402			
Ballfields - Phase 2 - SU-6D	31	22,837			
Ballfields - Phase 2 - SU-7A	43	24,010			
Ballfields - Phase 2 - SU-7B	14	696			
Ballfields - Phase 2 - SU-7C	50	18,900			
Ballfields - Phase 2 - SU-7D	28	4,837			
Ballfields - Phase 2 - SU-8A	21	6,357			
Ballfields - Phase 2 - SU-8B	13	4,515			
	Total	**395,815**	1,081	37	**2.9E+05**

Table A1-4. SLAPS Properties Average Surface Area and Flow Rate per Location for CY 2012 (Continued)

Location	Total Days	Surface Area * Total Days	Average Surface Area/year (m^2)	Diameter of Stack $D=(1.3*A)^{1/2}$(m)	Flow Rate $F=V*Pi*(D)^2/4$ (m^3/min.)
Eva Loadout					
Eva Loadout SU-1A	31	2,169			
Eva Loadout SU-1B	35	2,418			
Eva Loadout SU-1C	23	1,342			
Eva Loadout SU-1D	29	2,517			
Eva Loadout SU-1E	16	1,584			
Eva Loadout SU-1F	30	2,397			
Eva Loadout SU-1G	15	175			
Eva Loadout SU-1H	28	838			
Eva Loadout SU-1I	22	1,348			
Eva Loadout SU-1J	20	40			
Frost Avenue ROW SU-1	18	792			
	Total	**15,619**	43	7	**1.2E+04**
SLAPS Loadout					
SLAPS Loadout	366	219,600			
	Total	**219,600**	600	28	**1.6E+05**

Table A1-5. SLAPS Properties Airborne Radioactive Particulate Emissions Based on Site Perimeter Air Samples for CY 2012[a]

Property	Ballfields			Eva Loadout			SLAPS Loadout		
Radionuclide	Activity Fraction[a]	Emission Conc. (µCi/cm^3)[b]	Release Rate (Ci/yr)[c]	Activity Fraction[a]	Emission Conc. (µCi/cm^3)[b]	Release Rate (Ci/yr)[c]	Activity Fraction[a]	Emission Conc. (µCi/cm^3)[b]	Release Rate (Ci/yr)[c]
U-238	0.05	1.7E-16	2.6E-05	0.01	6.2E-17	3.9E-07	4.7E-02	1.8E-16	1.5E-05
U-235	0.01	2.3E-17	3.5E-06	0.0005	2.7E-18	1.7E-08	6.1E-03	2.3E-17	2.0E-06
U-234	0.05	1.7E-16	2.6E-05	0.01	6.2E-17	3.9E-07	4.7E-02	1.8E-16	1.5E-05
Ra-226	0.02	8.4E-17	1.3E-05	0.01	3.6E-17	2.3E-07	2.3E-02	8.7E-17	7.3E-06
Th-232	0.01	4.4E-17	6.7E-06	0.001	5.2E-18	3.3E-08	1.2E-02	4.5E-17	3.8E-06
Th-230	0.76	2.7E-15	4.1E-04	0.95	5.2E-15	3.3E-05	7.6E-01	2.9E-15	2.4E-04
Th-228	0.01	4.0E-17	6.1E-06	0.001	5.2E-18	3.3E-08	1.1E-02	4.1E-17	3.5E-06
Ra-224[d]	0.01	4.0E-17	6.1E-06	0.001	5.2E-18	3.3E-08	1.1E-02	4.1E-17	3.5E-06
Th-234[d]	0.41	1.2E-14	1.8E-03	0.48	1.5E-14	9.3E-05	4.1E-01	1.1E-14	9.6E-04
Pa-234m[d]	0.41	1.2E-14	1.8E-03	0.48	1.5E-14	9.3E-05	4.1E-01	1.1E-14	9.6E-04
Th-231[d]	0.05	1.5E-15	2.4E-04	0.02	6.4E-16	4.0E-06	5.4E-02	1.5E-15	1.3E-04
Ra-228	0.06	1.8E-15	2.7E-04	0.01	4.4E-16	2.8E-06	6.2E-02	1.7E-15	1.4E-04
Ac-228[d]	0.06	1.8E-15	2.7E-04	0.01	4.4E-16	2.8E-06	6.2E-02	1.7E-15	1.4E-04
Pa-231	0.04	1.6E-16	2.4E-05	0.01	4.1E-17	2.6E-07	4.2E-02	1.6E-16	1.3E-05
Ac-227	0.04	1.4E-16	2.1E-05	0.01	3.6E-17	2.3E-07	3.7E-02	1.4E-16	1.2E-05

[a] Derived from the average soil radionuclide concentrations from the FS, Table D-5 (USACE 2003). Average soil radionuclide concentrations are presented in Table A1-1. Activity fractions have been rounded; non-rounded values were used in calculations.
[b] Emission concentration is equal to the activity fraction * the gross alpha or gross beta airborne particulate concentrations listed in Table A1-2.
[c] Release rate based on 366-day period at measured flow rate (Table A1-4) for each site as determined from the average annual wind speed (4.446 m per second) and calculated site area (Table A1-4). (Note: 1 milliliter [mL] = 1 cubic centimeter [cm^3]).
[d] Note: When data was not available, the radionuclide was assumed to be in secular equilibrium with the parent.

Table A1-6. FUSRAP Laboratory Lab Analyses for CY 2012[a]

Site	Type	Gamma	IsoRa[b]	IsoTh[b]	IsoU[b]	Total Drying and Grinding[c]	Total Separations[d]
HISS	soil	21	0	13	0	21	13
HISS	water	0	10	10	10	0	30
Latty Avenue Properties	soil	505	0	504	0	505	504
Latty Avenue Properties	water	0	0	0	0	0	0
IAAAP	soil	0	0	0	0	0	0
IAAAP	water	0	0	0	0	0	0
SLAPS	soil	11	0	11	0	11	11
SLAPS	water	0	11	11	11	0	33
SLAPS VPs	soil	2,545	0	2,328	0	2,545	2,328
SLAPS VPs	water	5	28	28	0	5	56
Coldwater Creek	sediment (soil)	665	0	661	0	665	661
Coldwater Creek	water	0	14	14	14	0	42
SLDS	soil	685	0	652	0	685	652
SLDS	water	0	45	45	8	0	98

HISS and Latty Avenue Properties	**Total**	526	547
IAAAP	**Total**	0	0
SLAPS, SLAPS VPs, and Coldwater Creek	**Total**	3,221	3,131
SLDS	**Total**	685	750

[a] Data provided by the USACE radioanalytical laboratory for CY 2012.
[b] Assumes isotopic radium, thorium, and uranium occur in separate and distinct processes.
[c] Assumes all soil samples went through a drying/grinding process.
[d] Assumes all soil and water samples for isotopic radium, thorium, and uranium went through a separations process.

Notes:
Coldwater Creek samples use SLAPS characterization data to determine release rates.
Gamma – Gamma Spectroscopy; IAAAP – Iowa Army Ammunition Plant; IsoRa – Isotopic Radium; IsoTh – Isotopic Thorium; IsoU – Isotopic Uranium.

Table A1-7. SLDS Property Laboratory Samples for CY 2012

Radionuclide	Avg. (pCi/g)	No. Samples[b]	No. Samples[c]	Emission Rate[d] (Ci/yr)
U-238[a]	79	685	750	3.5E-07
U-235[a]	4	685	750	1.7E-08
U-234[a]	78	685	750	3.5E-07
Ra-226[a]	20	685	750	8.9E-08
Th-232[a]	5	685	750	2.1E-08
Th-230[a]	28	685	750	1.3E-07
Th-228[a]	5	685	750	2.1E-08
Ra-224[e]	5	685	750	2.1E-08
Th-234[e]	79	685	750	3.5E-07
Pa-234m[e]	79	685	750	3.5E-07
Th-231[e]	4	685	750	1.7E-08
Ra-228[e]	5	685	750	2.1E-08
Ac-228[e]	5	685	750	2.1E-08
Pa-231[e]	4	685	750	1.7E-08
Ac-227[e]	4	685	750	1.7E-08

[a] Average soil concentration from Table A1-1 of the SLDS EMDAR CY 2012, Appendix A, Attachment A-1 (USACE 2013).
[b] Number of samples involved in drying/grinding operations.
[c] Number of samples involved in separations operations.
[d] Emission Rate = (0.001*Avg * No. Samples [drying & grinding]+ 0.005*Avg * No. Samples [separations])*(1,000 g * 1E-12Ci/pCi).
[e] Note: When data was not available, the radionuclide was assumed to be in secular equilibrium with the parent.

Table A1-8. SLAPS and SLAPS VPs Laboratory Samples for CY 2012

Radionuclide	Avg. (pCi/g)	No. Samples[b]	No. Samples[c]	Emission Rate[d] (Ci/yr)
U-238[a]	3.35	3221	3131	6.3E-08
U-235[a]	0.44	3221	3131	8.3E-09
U-234[a]	3.35	3221	3131	6.3E-08
Ra-226[a]	1.66	3221	3131	3.1E-08
Th-232[a]	0.85	3221	3131	1.6E-08
Th-230[a]	54.98	3221	3131	1.0E-06
Th-228[a]	0.78	3221	3131	1.5E-08
Ra-224[e]	0.78	3221	3131	1.5E-08
Th-234[e]	3.35	3221	3131	6.3E-08
Pa-234m[e]	3.35	3221	3131	6.3E-08
Th-231[e]	0.44	3221	3131	8.3E-09
Ra-228[e]	0.50	3221	3131	9.5E-09
Ac-228[e]	0.50	3221	3131	9.5E-09
Pa-231[a]	3.04	3221	3131	5.7E-08
Ac-227[a]	2.67	3221	3131	5.0E-08

[a] Average soil concentration from Table A1-1.
[b] Number of samples involved in drying/grinding operations.
[c] Number of samples involved in separations operations.
[d] Emission Rate = (0.001*Avg * No. Samples [drying &grinding]+ 0.005*Avg * No. Samples [separations])*(1,000 g * 1E-12Ci/pCi).
[e] Note: When data was not available, the radionuclide was assumed to be in secular equilibrium with the parent.

Table A1-9. Latty Avenue Property Laboratory Samples for CY 2012

Radionuclide	Avg. (pCi/g)[a]	No. Samples[b]	No. Samples[c]	Emission Rate[d] (Ci/yr)
U-238	18	526	547	6.0E-08
U-235	1	526	547	3.1E-09
U-234	17	526	547	5.5E-08
Ra-226	13	526	547	4.4E-08
Th-232	2	526	547	6.5E-09
Th-230	93	526	547	3.0E-07
Th-228	1	526	547	3.4E-09
Ra-224	1	526	547	3.4E-09
Th-234	18	526	547	6.0E-08
Pa-234m	18	526	547	6.0E-08
Th-231	1	526	547	3.1E-09
Ra-228	0.6	526	547	2.0E-09
Ac-228	0.6	526	547	2.0E-09
Pa-231	13	526	547	4.2E-08
Ac-227	11	526	547	3.6E-08

[a] Average soil concentration from Table A1-15 of the NC Sites EMDAR CY 2011, Appendix A, Attachment A-1 (USACE 2012).
[b] Number of samples involved in drying/grinding operations.
[c] Number of samples involved in separations operations.
[d] Emission Rate = (0.001*Avg * No. Samples [drying & grinding]+ 0.005*Avg * No. Samples [separations])*(1,000 g * 1E-12Ci/pCi).

Table A1-10. Total Laboratory Airborne Radioactive Particulate Emission Rate for CY 2012

Radionuclides	Emission Rate (Ci/yr)			
	SLDS	SLAPS/ SLAPS VPs	Latty Avenue Properties	Total Across Lab[a]
U-238	3.5E-07	6.3E-08	6.0E-08	4.7E-07
U-235	1.7E-08	8.3E-09	3.1E-09	2.8E-08
U-234	3.5E-07	6.3E-08	5.5E-08	4.7E-07
Ra-226	8.9E-08	3.1E-08	4.4E-08	1.6E-07
Th-232	2.1E-08	1.6E-08	6.5E-09	4.4E-08
Th-230	1.3E-07	1.0E-06	3.0E-07	1.5E-06
Th-228	2.1E-08	1.5E-08	3.4E-09	3.9E-08
Ra-224	2.1E-08	1.5E-08	3.4E-09	3.9E-08
Th-234	3.5E-07	6.3E-08	6.0E-08	4.7E-07
Pa-234m	3.5E-07	6.3E-08	6.0E-08	4.7E-07
Th-231	1.7E-08	8.3E-09	3.1E-09	2.8E-08
Ra-228	2.1E-08	9.5E-09	2.0E-09	3.2E-08
Ac-228	2.1E-08	9.5E-09	2.0E-09	3.2E-08
Pa-231	1.7E-08	5.7E-08	4.2E-08	1.2E-07
Ac-227	1.7E-08	5.0E-08	3.6E-08	1.0E-07

[a] Total emission rate is the sum of the SLDS, SLAPS and SLAPS VPs, and Latty Avenue Properties emission rates.

ATTACHMENT A-2

CAP88-PC RUNS FOR NORTH ST. LOUIS COUNTY SITES PROPERTIES

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CAP88-PC RUNS FOR THE SLAPS PROPERTIES

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CAP88 OUTPUT RESULTS

Ballfields

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                          Version 3.0


             Clean Air Act Assessment Package - 1988


 D O S E   A N D   R I S K   E Q U I V A L E N T   S U M M A R I E S

                 Non-Radon Individual Assessment
                      Mar  8, 2013  09:53 am



      Facility:  Ballfields
       Address:  SLAPS
          City:  Hazelwood
         State:  MO          Zip:    63042


      Source Category:
          Source Type:  Area
        Emission Year:  2012


      Comments:  Air
                 Air


         Dataset Name:  Ballfields 12
         Dataset Date:  3/8/2013 9:52:00 AM
            Wind File:  .   C:\Program Files\CAP88-PC30\WindLib\13994.WND
```

Mar 8, 2013 09:53 am

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	5.00E-04
B Surfac	1.50E-01
Breasts	5.23E-04
St Wall	5.09E-04
ULI Wall	5.55E-04
Kidneys	2.37E-03
Lungs	2.10E-02
Ovaries	1.61E-03
R Marrow	6.80E-03
Spleen	5.12E-04
Thymus	5.06E-04
Uterus	5.05E-04
Bld Wall	5.12E-04
Brain	5.08E-04
Esophagu	9.15E-03
SI Wall	5.08E-04
LLI Wall	6.46E-04
Liver	7.04E-03
Muscle	5.28E-04
Pancreas	4.99E-04
Skin	3.71E-03
Testes	1.65E-03
Thyroid	5.17E-04
EFFEC	1.13E-01

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	6.16E-03
INHALATION	1.07E-01
AIR IMMERSION	5.78E-07
GROUND SURFACE	1.80E-04
INTERNAL	1.13E-01
EXTERNAL	1.80E-04
TOTAL	1.13E-01

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-238	7.43E-04
Th-234	1.47E-04
Pa-234m	2.89E-05
Pa-234	6.62E-07
U-234	9.02E-04
Th-230	5.71E-02
Ra-226	5.40E-04
Rn-222	1.01E-14
Po-218	5.37E-11
Pb-214	1.49E-06
Bi-214	8.95E-06
Po-214	4.91E-10
Pb-210	6.53E-07
Bi-210	1.75E-09
Po-210	5.50E-08
At-218	0.00E+00
U-235	1.08E-04
Th-231	8.15E-07
Pa-231	2.22E-02
Ac-227	1.51E-02
Th-227	1.75E-06
Ra-223	1.16E-05
Rn-219	0.00E+00
Po-215	1.01E-09
Pb-211	5.69E-07
Bi-211	2.64E-07
Tl-207	3.32E-07
Po-211	1.22E-10
Fr-223	1.77E-08
Th-232	1.65E-03
Ra-228	1.19E-02
Ac-228	1.51E-04
Th-228	2.39E-03
Ra-224	1.80E-04
Rn-220	4.35E-12
Po-216	1.80E-10
Pb-212	1.58E-06
Bi-212	2.50E-06
Po-212	0.00E+00
Tl-208	1.18E-05
TOTAL	1.13E-01

Mar 8, 2013 09:53 am SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	6.52E-11
Stomach	1.96E-10
Colon	6.41E-10
Liver	1.73E-09
LUNG	3.90E-08
Bone	2.04E-09
Skin	8.16E-12
Breast	1.11E-10
Ovary	2.95E-10
Bladder	1.51E-10
Kidneys	1.95E-10
Thyroid	1.47E-11
Leukemia	4.01E-10
Residual	7.05E-10
Total	4.55E-08
TOTAL	9.11E-08

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	2.11E-09
INHALATION	4.33E-08
AIR IMMERSION	2.97E-13
GROUND SURFACE	8.47E-11
INTERNAL	4.55E-08
EXTERNAL	8.50E-11
TOTAL	4.55E-08

Mar 8, 2013 09:53 am **SUMMARY**
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	6.12E-10
Th-234	1.40E-10
Pa-234m	4.64E-12
Pa-234	3.61E-13
U-234	7.45E-10
Th-230	2.92E-08
Ra-226	4.08E-10
Rn-222	5.48E-21
Po-218	2.95E-17
Pb-214	7.95E-13
Bi-214	4.75E-12
Po-214	2.70E-16
Pb-210	2.17E-13
Bi-210	9.38E-16
Po-210	2.11E-14
At-218	0.00E+00
U-235	8.91E-11
Th-231	7.72E-13
Pa-231	2.09E-09
Ac-227	3.97E-09
Th-227	1.44E-12
Ra-223	6.32E-12
Rn-219	0.00E+00
Po-215	5.53E-16
Pb-211	1.89E-13
Bi-211	1.45E-13
Tl-207	4.25E-14
Po-211	6.68E-17
Fr-223	9.93E-15
Th-232	7.25E-10
Ra-228	5.26E-09
Ac-228	8.35E-11
Th-228	2.04E-09
Ra-224	1.55E-10
Rn-220	2.38E-18
Po-216	9.87E-17
Pb-212	8.84E-13
Bi-212	1.12E-12
Po-212	0.00E+00
Tl-208	6.46E-12
TOTAL	4.55E-08

Mar 8, 2013 09:53 am

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	490	775	1485	2265	
N	1.1E-01	5.0E-02	1.9E-02	1.2E-02	
NNW	6.0E-02	2.8E-02	1.2E-02	8.2E-03	
NW	7.0E-02	3.2E-02	1.3E-02	8.8E-03	
WNW	8.4E-02	3.8E-02	1.5E-02	9.7E-03	
W	6.5E-02	3.0E-02	1.2E-02	8.4E-03	
WSW	3.3E-02	1.7E-02	8.4E-03	6.4E-03	Business
SW	4.5E-02	2.2E-02	9.9E-03	7.2E-03	
SSW	5.5E-02	2.6E-02	1.1E-02	7.8E-03	
S	4.9E-02	2.3E-02	1.0E-02	7.5E-03	
SSE	3.6E-02	1.8E-02	8.7E-03	6.6E-03	
SE	5.0E-02	2.4E-02	1.1E-02	7.5E-03	
ESE	8.2E-02	3.7E-02	1.5E-02	9.6E-03	
E	1.1E-01	4.7E-02	1.8E-02	1.1E-02	School
ENE	8.8E-02	3.9E-02	1.5E-02	9.9E-03	
NE	5.6E-02	2.6E-02	1.1E-02	7.9E-03	Residence / Farm
NNE	4.8E-02	2.3E-02	1.0E-02	7.4E-03	

Mar 8, 2013 09:53 am

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	490	775	1485	2265
N	4.6E-08	2.0E-08	7.4E-09	4.4E-09
NNW	2.4E-08	1.1E-08	4.6E-09	3.1E-09
NW	2.8E-08	1.3E-08	5.1E-09	3.3E-09
WNW	3.4E-08	1.5E-08	5.8E-09	3.6E-09
W	2.6E-08	1.2E-08	4.8E-09	3.1E-09
WSW	1.3E-08	6.5E-09	3.1E-09	2.3E-09
SW	1.8E-08	8.4E-09	3.7E-09	2.6E-09
SSW	2.2E-08	1.0E-08	4.2E-09	2.9E-09
S	2.0E-08	9.1E-09	4.0E-09	2.7E-09
SSE	1.4E-08	6.9E-09	3.3E-09	2.4E-09
SE	2.0E-08	9.3E-09	4.0E-09	2.8E-09
ESE	3.3E-08	1.5E-08	5.7E-09	3.6E-09
E	4.3E-08	1.9E-08	6.9E-09	4.1E-09
ENE	3.6E-08	1.6E-08	6.0E-09	3.7E-09
NE	2.2E-08	1.0E-08	4.3E-09	2.9E-09
NNE	1.9E-08	8.9E-09	3.9E-09	2.7E-09

CAP88 OUTPUT RESULTS

Eva Loadout

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                          C A P 8 8 - P C

                            Version 3.0


                Clean Air Act Assessment Package - 1988


    D O S E   A N D   R I S K   E Q U I V A L E N T   S U M M A R I E S

                    Non-Radon Individual Assessment
                         Apr  25, 2013  10:12 am



          Facility:  Eva Loadout
           Address:  SLAPS
              City:  Berkeley
             State:  MO          Zip:    63134


          Source Category:  Area
              Source Type:  Area
            Emission Year:  2012


          Comments:  Air
                     Air


             Dataset Name:  VP16CY12
             Dataset Date:  4/25/2013 10:11:00 AM
             Wind File:  .   C:\Program Files (x86)\CAP88-
PC30\WindLib\13994.WND
```

Apr 25, 2013 10:12 am

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.36E-05
B Surfac	7.80E-03
Breasts	1.41E-05
St Wall	1.38E-05
ULI Wall	1.53E-05
Kidneys	1.22E-04
Lungs	1.70E-03
Ovaries	6.93E-05
R Marrow	3.01E-04
Spleen	1.38E-05
Thymus	1.37E-05
Uterus	1.37E-05
Bld Wall	1.38E-05
Brain	1.38E-05
Esophagu	7.79E-04
SI Wall	1.39E-05
LLI Wall	1.82E-05
Liver	1.76E-04
Muscle	1.41E-05
Pancreas	1.36E-05
Skin	1.87E-04
Testes	7.08E-05
Thyroid	1.39E-05
EFFEC	6.93E-03

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.93E-04
INHALATION	6.63E-03
AIR IMMERSION	1.35E-08
GROUND SURFACE	4.13E-06
INTERNAL	6.92E-03
EXTERNAL	4.14E-06
TOTAL	6.93E-03

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-238	1.49E-05
Th-234	1.34E-05
Pa-234m	1.88E-06
Pa-234	3.98E-08
U-234	1.80E-05
Th-230	6.12E-03
Ra-226	1.51E-05
Rn-222	0.00E+00
Po-218	1.24E-12
Pb-214	3.44E-08
Bi-214	2.07E-07
Po-214	1.14E-11
Pb-210	0.00E+00
Bi-210	0.00E+00
Po-210	0.00E+00
At-218	0.00E+00
U-235	7.01E-07
Th-231	1.74E-08
Pa-231	3.17E-04
Ac-227	2.17E-04
Th-227	1.05E-08
Ra-223	1.01E-08
Rn-219	0.00E+00
Po-215	1.40E-11
Pb-211	7.90E-09
Bi-211	3.66E-09
Tl-207	4.61E-09
Po-211	0.00E+00
Fr-223	0.00E+00
Th-232	1.07E-05
Ra-228	1.72E-04
Ac-228	2.02E-06
Th-228	1.69E-05
Ra-224	1.26E-06
Rn-220	3.06E-14
Po-216	2.13E-12
Pb-212	1.77E-08
Bi-212	2.96E-08
Po-212	0.00E+00
Tl-208	1.40E-07
TOTAL	6.93E-03

Apr 25, 2013 10:12 am

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.77E-12
Stomach	4.84E-12
Colon	2.55E-11
Liver	3.88E-11
LUNG	3.10E-09
Bone	8.78E-11
Skin	2.99E-13
Breast	2.65E-12
Ovary	1.18E-11
Bladder	4.17E-12
Kidneys	8.62E-12
Thyroid	3.63E-13
Leukemia	1.41E-11
Residual	1.69E-11
Total	3.32E-09
TOTAL	6.64E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	5.95E-11
INHALATION	3.26E-09
AIR IMMERSION	6.18E-15
GROUND SURFACE	1.49E-12
INTERNAL	3.32E-09
EXTERNAL	1.50E-12
TOTAL	3.32E-09

Apr 25, 2013 10:12 am **SUMMARY**
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.21E-11
Th-234	1.46E-11
Pa-234m	3.03E-13
Pa-234	2.17E-14
U-234	1.47E-11
Th-230	3.08E-09
Ra-226	1.03E-11
Rn-222	0.00E+00
Po-218	6.81E-19
Pb-214	1.84E-14
Bi-214	1.10E-13
Po-214	6.23E-18
Pb-210	0.00E+00
Bi-210	0.00E+00
Po-210	0.00E+00
At-218	0.00E+00
U-235	5.71E-13
Th-231	1.66E-14
Pa-231	2.99E-11
Ac-227	5.70E-11
Th-227	5.68E-15
Ra-223	5.46E-15
Rn-219	0.00E+00
Po-215	7.67E-18
Pb-211	2.62E-15
Bi-211	2.01E-15
Tl-207	5.89E-16
Po-211	0.00E+00
Fr-223	0.00E+00
Th-232	4.68E-12
Ra-228	7.58E-11
Ac-228	1.12E-12
Th-228	1.44E-11
Ra-224	1.09E-12
Rn-220	1.67E-20
Po-216	1.17E-18
Pb-212	9.66E-15
Bi-212	1.33E-14
Po-212	0.00E+00
Tl-208	7.65E-14
TOTAL	3.32E-09

Apr 25, 2013 10:12 am SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	425	1060	1425	1915	
N	6.9E-03	1.4E-03	9.4E-04	6.5E-04	Residence
NNW	3.6E-03	8.3E-04	5.8E-04	4.3E-04	
NW	4.3E-03	9.3E-04	6.4E-04	4.7E-04	
WNW	5.2E-03	1.1E-03	7.3E-04	5.2E-04	
W	3.9E-03	8.6E-04	6.0E-04	4.5E-04	Business / School
WSW	2.0E-03	5.2E-04	4.0E-04	3.2E-04	
SW	2.7E-03	6.5E-04	4.7E-04	3.7E-04	
SSW	3.3E-03	7.6E-04	5.4E-04	4.0E-04	
S	2.9E-03	7.0E-04	5.0E-04	3.9E-04	
SSE	2.1E-03	5.5E-04	4.2E-04	3.3E-04	
SE	3.0E-03	7.1E-04	5.1E-04	3.9E-04	
ESE	5.0E-03	1.1E-03	7.2E-04	5.2E-04	
E	6.5E-03	1.3E-03	8.7E-04	6.0E-04	
ENE	5.4E-03	1.1E-03	7.6E-04	5.4E-04	
NE	3.4E-03	7.7E-04	5.5E-04	4.1E-04	
NNE	2.9E-03	6.8E-04	4.9E-04	3.8E-04	Farm

Apr 25, 2013 10:12 am

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	425	1060	1425	1915
N	3.3E-09	6.3E-10	4.0E-10	2.6E-10
NNW	1.7E-09	3.5E-10	2.3E-10	1.5E-10
NW	2.0E-09	3.9E-10	2.5E-10	1.7E-10
WNW	2.5E-09	4.7E-10	3.0E-10	2.0E-10
W	1.9E-09	3.6E-10	2.4E-10	1.6E-10
WSW	9.1E-10	2.0E-10	1.4E-10	9.8E-11
SW	1.3E-09	2.6E-10	1.7E-10	1.2E-10
SSW	1.6E-09	3.1E-10	2.0E-10	1.4E-10
S	1.4E-09	2.8E-10	1.9E-10	1.3E-10
SSE	9.8E-10	2.1E-10	1.4E-10	1.0E-10
SE	1.4E-09	2.9E-10	1.9E-10	1.3E-10
ESE	2.4E-09	4.6E-10	2.9E-10	1.9E-10
E	3.1E-09	5.8E-10	3.7E-10	2.4E-10
ENE	2.6E-09	4.9E-10	3.1E-10	2.0E-10
NE	1.6E-09	3.2E-10	2.1E-10	1.4E-10
NNE	1.3E-09	2.7E-10	1.8E-10	1.3E-10

CAP88 OUTPUT RESULTS

SLAPS Loadout

```
                         C A P 8 8 - P C

                          Version 3.0

             Clean Air Act Assessment Package - 1988


 D O S E   A N D   R I S K   E Q U I V A L E N T   S U M M A R I E S

                  Non-Radon Individual Assessment
                     Mar  19, 2013  03:24 pm


     Facility:  SLAPS Loadout
      Address:  SLAPS
         City:  Berkeley
        State:  MO         Zip:    63134


     Source Category:  Area
         Source Type:  Area
       Emission Year:  2012


     Comments:  Air
                Air


        Dataset Name:  SLAPS Loadout 12
        Dataset Date:  3/19/2013 3:24:00 PM
           Wind File:  .   C:\Program Files\CAP88-PC30\WindLib\13994.WND
```

Mar 19, 2013 03:24 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.62E-04
B Surfac	8.09E-02
Breasts	2.74E-04
St Wall	2.67E-04
ULI Wall	2.91E-04
Kidneys	1.27E-03
Lungs	1.16E-02
Ovaries	8.67E-04
R Marrow	3.63E-03
Spleen	2.68E-04
Thymus	2.65E-04
Uterus	2.65E-04
Bld Wall	2.68E-04
Brain	2.66E-04
Esophagu	5.08E-03
SI Wall	2.66E-04
LLI Wall	3.39E-04
Liver	3.80E-03
Muscle	2.76E-04
Pancreas	2.62E-04
Skin	1.91E-03
Testes	8.87E-04
Thyroid	2.71E-04
EFFEC	6.17E-02

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	3.13E-03
INHALATION	5.85E-02
AIR IMMERSION	2.90E-07
GROUND SURFACE	9.13E-05
INTERNAL	6.16E-02
EXTERNAL	9.16E-05
TOTAL	6.17E-02

Mar 19, 2013 03:24 pm **SUMMARY**
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-238	4.12E-04
Th-234	7.54E-05
Pa-234m	1.49E-05
Pa-234	3.43E-07
U-234	5.01E-04
Th-230	3.22E-02
Ra-226	2.92E-04
Rn-222	5.45E-15
Po-218	2.91E-11
Pb-214	8.07E-07
Bi-214	4.84E-06
Po-214	2.66E-10
Pb-210	3.51E-07
Bi-210	9.44E-10
Po-210	2.96E-08
At-218	0.00E+00
U-235	5.95E-05
Th-231	4.25E-07
Pa-231	1.16E-02
Ac-227	8.29E-03
Th-227	9.63E-07
Ra-223	6.36E-06
Rn-219	0.00E+00
Po-215	5.55E-10
Pb-211	3.13E-07
Bi-211	1.45E-07
Tl-207	1.83E-07
Po-211	6.70E-11
Fr-223	9.74E-09
Th-232	8.98E-04
Ra-228	5.92E-03
Ac-228	7.53E-05
Th-228	1.32E-03
Ra-224	9.93E-05
Rn-220	2.40E-12
Po-216	9.25E-11
Pb-212	8.12E-07
Bi-212	1.28E-06
Po-212	0.00E+00
Tl-208	6.08E-06
TOTAL	6.17E-02

Mar 19, 2013 03:24 pm **SUMMARY**
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	3.41E-11
Stomach	1.01E-10
Colon	3.30E-10
Liver	9.25E-10
LUNG	2.16E-08
Bone	1.08E-09
Skin	4.22E-12
Breast	5.74E-11
Ovary	1.57E-10
Bladder	7.89E-11
Kidneys	1.03E-10
Thyroid	7.60E-12
Leukemia	2.10E-10
Residual	3.64E-10
Total	2.51E-08
TOTAL	5.02E-08

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.06E-09
INHALATION	2.40E-08
AIR IMMERSION	1.49E-13
GROUND SURFACE	4.29E-11
INTERNAL	2.51E-08
EXTERNAL	4.30E-11
TOTAL	2.51E-08

Mar 19, 2013 03:24 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	3.40E-10
Th-234	7.19E-11
Pa-234m	2.39E-12
Pa-234	1.87E-13
U-234	4.14E-10
Th-230	1.64E-08
Ra-226	2.20E-10
Rn-222	2.96E-21
Po-218	1.60E-17
Pb-214	4.31E-13
Bi-214	2.57E-12
Po-214	1.46E-16
Pb-210	1.16E-13
Bi-210	5.05E-16
Po-210	1.13E-14
At-218	0.00E+00
U-235	4.90E-11
Th-231	4.03E-13
Pa-231	1.09E-09
Ac-227	2.18E-09
Th-227	7.92E-13
Ra-223	3.46E-12
Rn-219	0.00E+00
Po-215	3.04E-16
Pb-211	1.04E-13
Bi-211	7.96E-14
Tl-207	2.34E-14
Po-211	3.67E-17
Fr-223	5.46E-15
Th-232	3.96E-10
Ra-228	2.62E-09
Ac-228	4.17E-11
Th-228	1.13E-09
Ra-224	8.53E-11
Rn-220	1.31E-18
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	5.75E-13
Po-212	0.00E+00
Tl-208	3.31E-12
TOTAL	2.51E-08

Mar 19, 2013 03:24 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m) 500	770	1710	2580	
N	6.2E-02	2.9E-02	8.8E-03	5.5E-03	
NNW	3.3E-02	1.6E-02	5.7E-03	4.0E-03	
NW	3.8E-02	1.8E-02	6.2E-03	4.2E-03	
WNW	4.6E-02	2.2E-02	7.0E-03	4.6E-03	
W	3.5E-02	1.7E-02	5.8E-03	4.1E-03	
WSW	1.8E-02	9.3E-03	4.0E-03	3.2E-03	Business
SW	2.5E-02	1.2E-02	4.7E-03	3.5E-03	
SSW	3.0E-02	1.4E-02	5.2E-03	3.8E-03	
S	2.7E-02	1.3E-02	5.0E-03	3.6E-03	
SSE	1.9E-02	9.9E-03	4.2E-03	3.3E-03	
SE	2.7E-02	1.3E-02	5.0E-03	3.7E-03	
ESE	4.5E-02	2.1E-02	6.9E-03	4.6E-03	
E	5.8E-02	2.7E-02	8.2E-03	5.2E-03	School
ENE	4.8E-02	2.2E-02	7.2E-03	4.7E-03	
NE	3.0E-02	1.5E-02	5.3E-03	3.8E-03	Residence / Farm
NNE	2.6E-02	1.3E-02	4.9E-03	3.6E-03	

Mar 19, 2013 03:24 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	500	770	1710	2580
N	2.5E-08	1.2E-08	3.4E-09	2.1E-09
NNW	1.3E-08	6.3E-09	2.2E-09	1.5E-09
NW	1.5E-08	7.2E-09	2.4E-09	1.6E-09
WNW	1.9E-08	8.6E-09	2.7E-09	1.7E-09
W	1.4E-08	6.7E-09	2.2E-09	1.5E-09
WSW	7.2E-09	3.6E-09	1.5E-09	1.1E-09
SW	9.9E-09	4.8E-09	1.8E-09	1.3E-09
SSW	1.2E-08	5.7E-09	2.0E-09	1.4E-09
S	1.1E-08	5.2E-09	1.9E-09	1.3E-09
SSE	7.7E-09	3.9E-09	1.5E-09	1.2E-09
SE	1.1E-08	5.3E-09	1.9E-09	1.3E-09
ESE	1.8E-08	8.4E-09	2.7E-09	1.7E-09
E	2.3E-08	1.1E-08	3.2E-09	2.0E-09
ENE	2.0E-08	9.0E-09	2.8E-09	1.8E-09
NE	1.2E-08	5.8E-09	2.0E-09	1.4E-09
NNE	1.0E-08	5.0E-09	1.8E-09	1.3E-09

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CAP88-PC RUNS FOR THE USACE LAB

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CAP88 OUTPUT RESULTS

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E   A N D   R I S K   E Q U I V A L E N T   S U M M A R I E S

Non-Radon Individual Assessment
Mar 21, 2013 09:01 am

```
     Facility:  HISS Laboratory
      Address:  Latty Avenue
         City:  Berkeley
        State:  MO          Zip:    63134

     Source Category:  Area
         Source Type:  Stack
       Emission Year:  2012

     Comments:  Air
                Air

        Dataset Name:  Lab 2012
        Dataset Date:  3/21/2013 9:01:00 AM
           Wind File:      C:\Program Files\CAP88-PC30\WindLib\13994.WND
```

Mar 21, 2013 09:01 am **SUMMARY**
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.48E-05
B Surfac	5.64E-03
Breasts	1.51E-05
St Wall	1.50E-05
ULI Wall	1.66E-05
Kidneys	8.45E-05
Lungs	8.42E-04
Ovaries	5.87E-05
R Marrow	2.25E-04
Spleen	1.50E-05
Thymus	1.49E-05
Uterus	1.49E-05
Bld Wall	1.50E-05
Brain	1.49E-05
Esophagu	3.36E-04
SI Wall	1.50E-05
LLI Wall	1.98E-05
Liver	2.80E-04
Muscle	1.52E-05
Pancreas	1.49E-05
Skin	4.44E-05
Testes	5.95E-05
Thyroid	1.50E-05
EFFEC	4.33E-03

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	5.57E-05
INHALATION	4.28E-03
AIR IMMERSION	9.57E-10
GROUND SURFACE	2.05E-06
INTERNAL	4.33E-03
EXTERNAL	2.05E-06
TOTAL	4.33E-03

Mar 21, 2013 09:01 am

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-238	1.27E-04
Th-234	4.13E-07
Pa-234m	2.18E-07
Pa-234	0.00E+00
U-234	1.54E-04
Th-230	1.98E-03
Ra-226	6.89E-05
Rn-222	0.00E+00
Po-218	6.65E-12
Pb-214	1.85E-07
Bi-214	1.11E-06
Po-214	6.08E-11
Pb-210	0.00E+00
Bi-210	0.00E+00
Po-210	0.00E+00
At-218	0.00E+00
U-235	8.17E-06
Th-231	2.75E-09
Pa-231	1.05E-03
Ac-227	6.80E-04
Th-227	5.32E-08
Ra-223	4.42E-07
Rn-219	0.00E+00
Po-215	4.21E-11
Pb-211	2.38E-08
Bi-211	1.10E-08
Tl-207	1.39E-08
Po-211	0.00E+00
Fr-223	0.00E+00
Th-232	1.02E-04
Ra-228	1.27E-05
Ac-228	1.66E-07
Th-228	1.44E-04
Ra-224	1.08E-05
Rn-220	2.45E-13
Po-216	2.68E-12
Pb-212	2.23E-08
Bi-212	3.72E-08
Po-212	0.00E+00
Tl-208	1.74E-07
TOTAL	4.33E-03

Mar 21, 2013 09:01 am **SUMMARY**
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.77E-12
Stomach	3.90E-12
Colon	1.15E-11
Liver	6.17E-11
LUNG	1.58E-09
Bone	6.04E-11
Skin	1.43E-13
Breast	2.23E-12
Ovary	9.77E-12
Bladder	4.24E-12
Kidneys	5.88E-12
Thyroid	3.16E-13
Leukemia	9.77E-12
Residual	1.44E-11
Total	1.77E-09
TOTAL	3.53E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.11E-11
INHALATION	1.75E-09
AIR IMMERSION	4.76E-16
GROUND SURFACE	9.98E-13
INTERNAL	1.76E-09
EXTERNAL	9.98E-13
TOTAL	1.77E-09

Mar 21, 2013 09:01 am **SUMMARY**
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.05E-10
Th-234	4.10E-13
Pa-234m	3.49E-14
Pa-234	0.00E+00
U-234	1.27E-10
Th-230	1.01E-09
Ra-226	5.28E-11
Rn-222	0.00E+00
Po-218	3.65E-18
Pb-214	9.84E-14
Bi-214	5.88E-13
Po-214	3.34E-17
Pb-210	0.00E+00
Bi-210	0.00E+00
Po-210	0.00E+00
At-218	0.00E+00
U-235	6.74E-12
Th-231	1.69E-15
Pa-231	9.91E-11
Ac-227	1.79E-10
Th-227	4.22E-14
Ra-223	2.41E-13
Rn-219	0.00E+00
Po-215	2.31E-17
Pb-211	7.90E-15
Bi-211	6.04E-15
Tl-207	1.78E-15
Po-211	0.00E+00
Fr-223	0.00E+00
Th-232	4.51E-11
Ra-228	5.65E-12
Ac-228	9.21E-14
Th-228	1.23E-10
Ra-224	9.30E-12
Rn-220	1.34E-19
Po-216	1.47E-18
Pb-212	1.22E-14
Bi-212	1.67E-14
Po-212	0.00E+00
Tl-208	9.50E-14
TOTAL	1.77E-09

Mar 21, 2013 09:01 am SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m) 110	300	310	1830	
N	4.3E-03	1.1E-03	1.0E-03	8.3E-05	
NNW	2.4E-03	5.8E-04	5.5E-04	6.2E-05	
NW	2.4E-03	6.7E-04	6.4E-04	6.5E-05	
WNW	2.8E-03	8.1E-04	7.7E-04	7.1E-05	
W	2.3E-03	6.2E-04	5.9E-04	6.3E-05	
WSW	1.2E-03	3.2E-04	3.1E-04	5.1E-05	
SW	1.5E-03	4.3E-04	4.1E-04	5.5E-05	
SSW	1.7E-03	5.3E-04	5.0E-04	5.9E-05	
S	1.9E-03	4.7E-04	4.5E-04	5.7E-05	Business
SSE	1.4E-03	3.4E-04	3.3E-04	5.2E-05	
SE	1.9E-03	4.8E-04	4.6E-04	5.8E-05	School
ESE	2.9E-03	7.9E-04	7.5E-04	7.0E-05	
E	3.4E-03	1.0E-03	9.7E-04	7.9E-05	
ENE	2.7E-03	8.4E-04	8.0E-04	7.2E-05	
NE	1.9E-03	5.3E-04	5.1E-04	6.0E-05	Residence / Farm
NNE	1.7E-03	4.6E-04	4.4E-04	5.6E-05	

Mar 21, 2013 09:01 am

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)			
Direction	110	300	310	1830
N	1.8E-09	4.4E-10	4.2E-10	2.6E-11
NNW	9.6E-10	2.3E-10	2.2E-10	1.7E-11
NW	9.9E-10	2.7E-10	2.5E-10	1.9E-11
WNW	1.2E-09	3.2E-10	3.1E-10	2.1E-11
W	9.3E-10	2.5E-10	2.3E-10	1.8E-11
WSW	4.6E-10	1.2E-10	1.2E-10	1.3E-11
SW	5.9E-10	1.7E-10	1.6E-10	1.5E-11
SSW	7.0E-10	2.1E-10	2.0E-10	1.6E-11
S	7.6E-10	1.9E-10	1.8E-10	1.5E-11
SSE	5.5E-10	1.3E-10	1.3E-10	1.3E-11
SE	7.7E-10	1.9E-10	1.8E-10	1.5E-11
ESE	1.2E-09	3.1E-10	3.0E-10	2.1E-11
E	1.4E-09	4.1E-10	3.9E-10	2.4E-11
ENE	1.1E-09	3.4E-10	3.2E-10	2.1E-11
NE	7.9E-10	2.1E-10	2.0E-10	1.6E-11
NNE	7.0E-10	1.8E-10	1.7E-10	1.5E-11

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APPENDIX B

ENVIRONMENTAL TLD, ALPHA TRACK, AND PERIMETER AIR DATA

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Table B-1. Background Air Particulate Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
HIS133569	BAP-001	01/03/12	Gross Alpha/Beta	Gross Alpha	5.298E-15	1.167E-15	4.51E-16	µCi/mL	=		HISS (General Area)-Perimeter Air
HIS133569	BAP-001	01/03/12	Gross Alpha/Beta	Gross Beta	1.651E-14	1.783E-15	1.396E-15	µCi/mL	=		HISS (General Area)-Perimeter Air
HIS141262	BAP-001	01/09/12	Gross Alpha/Beta	Gross Alpha	4.899E-15	1.15E-15	4.72E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141262	BAP-001	01/09/12	Gross Alpha/Beta	Gross Beta	2.033E-14	1.998E-15	1.46E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141263	BAP-001	01/17/12	Gross Alpha/Beta	Gross Alpha	6.719E-15	1.232E-15	4.01E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141263	BAP-001	01/17/12	Gross Alpha/Beta	Gross Beta	2.426E-14	1.968E-15	1.238E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141264	BAP-001	01/23/12	Gross Alpha/Beta	Gross Alpha	8.092E-15	1.675E-15	6.11E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141264	BAP-001	01/23/12	Gross Alpha/Beta	Gross Beta	2.738E-14	2.63E-15	1.89E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141265	BAP-001	01/30/12	Gross Alpha/Beta	Gross Alpha	4.281E-15	1.033E-15	4.36E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141265	BAP-001	01/30/12	Gross Alpha/Beta	Gross Beta	2.134E-14	1.948E-15	1.346E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141266	BAP-001	02/06/12	Gross Alpha/Beta	Gross Alpha	3.851E-15	1.005E-15	4.55E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141266	BAP-001	02/06/12	Gross Alpha/Beta	Gross Beta	1.789E-14	1.852E-15	1.406E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141267	BAP-001	02/13/12	Gross Alpha/Beta	Gross Alpha	3.77E-15	9.92E-16	4.53E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141267	BAP-001	02/13/12	Gross Alpha/Beta	Gross Beta	2.026E-14	1.947E-15	1.399E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141268	BAP-001	02/20/12	Gross Alpha/Beta	Gross Alpha	3.367E-15	9.18E-16	4.32E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141268	BAP-001	02/20/12	Gross Alpha/Beta	Gross Beta	2.018E-14	1.894E-15	1.337E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141269	BAP-001	02/27/12	Gross Alpha/Beta	Gross Alpha	2.672E-15	8.79E-16	4.89E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141269	BAP-001	02/27/12	Gross Alpha/Beta	Gross Beta	1.715E-14	1.897E-15	1.51E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141270	BAP-001	03/05/12	Gross Alpha/Beta	Gross Alpha	3.731E-15	9.74E-16	4.41E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141270	BAP-001	03/05/12	Gross Alpha/Beta	Gross Beta	1.977E-14	1.897E-15	1.362E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141271	BAP-001	03/12/12	Gross Alpha/Beta	Gross Alpha	2.442E-15	8.26E-16	4.7E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141271	BAP-001	03/12/12	Gross Alpha/Beta	Gross Beta	1.593E-14	1.799E-15	1.452E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141272	BAP-001	03/19/12	Gross Alpha/Beta	Gross Alpha	1.454E-15	6.32E-16	4.42E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141272	BAP-001	03/19/12	Gross Alpha/Beta	Gross Beta	1.36E-14	1.627E-15	1.366E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141273	BAP-001	03/26/12	Gross Alpha/Beta	Gross Alpha	7.57E-16	4.91E-16	4.57E-16	µCi/mL	J	T04	HISS Air (Particulate Air)-Environmental Monitoring
HIS141273	BAP-001	03/26/12	Gross Alpha/Beta	Gross Beta	1.273E-14	1.618E-15	1.413E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141274	BAP-001	04/02/12	Gross Alpha/Beta	Gross Alpha	5.907E-15	1.258E-15	4.98E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141274	BAP-001	04/02/12	Gross Alpha/Beta	Gross Beta	1.996E-14	2.003E-15	1.511E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141275	BAP-001	04/09/12	Gross Alpha/Beta	Gross Alpha	4.008E-15	1.048E-15	5.02E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141275	BAP-001	04/09/12	Gross Alpha/Beta	Gross Beta	1.51E-14	1.797E-15	1.522E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141276	BAP-001	04/16/12	Gross Alpha/Beta	Gross Alpha	5.083E-15	1.164E-15	4.93E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141276	BAP-001	04/16/12	Gross Alpha/Beta	Gross Beta	1.257E-14	1.657E-15	1.495E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141277	BAP-001	04/24/12	Gross Alpha/Beta	Gross Alpha	3.968E-15	9.66E-16	4.34E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141277	BAP-001	04/24/12	Gross Alpha/Beta	Gross Beta	1.425E-14	1.609E-15	1.316E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141278	BAP-001	04/30/12	Gross Alpha/Beta	Gross Alpha	5.059E-15	1.198E-15	5.24E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141278	BAP-001	04/30/12	Gross Alpha/Beta	Gross Beta	1.51E-14	1.845E-15	1.588E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141279	BAP-001	05/07/12	Gross Alpha/Beta	Gross Alpha	3.061E-15	9.16E-16	4.96E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141279	BAP-001	05/07/12	Gross Alpha/Beta	Gross Beta	1.048E-14	1.555E-15	1.503E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141280	BAP-001	05/14/12	Gross Alpha/Beta	Gross Alpha	3.102E-15	9.08E-16	4.82E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141280	BAP-001	05/14/12	Gross Alpha/Beta	Gross Beta	1.411E-14	1.708E-15	1.462E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141281	BAP-001	05/21/12	Gross Alpha/Beta	Gross Alpha	3.275E-15	9.39E-16	4.89E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141281	BAP-001	05/21/12	Gross Alpha/Beta	Gross Beta	1.977E-14	1.974E-15	1.484E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

Table B-1. Background Air Particulate Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
HIS141282	BAP-001	05/28/12	Gross Alpha/Beta	Gross Alpha	2.882E-15	8.82E-16	4.87E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141282	BAP-001	05/28/12	Gross Alpha/Beta	Gross Beta	1.967E-14	1.965E-15	1.477E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141283	BAP-001	06/04/12	Gross Alpha/Beta	Gross Alpha	2.695E-15	9.56E-16	5.99E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141283	BAP-001	06/04/12	Gross Alpha/Beta	Gross Beta	1.641E-14	2.069E-15	1.817E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141284	BAP-001	06/11/12	Gross Alpha/Beta	Gross Alpha	2.367E-15	8.03E-16	4.85E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141284	BAP-001	06/11/12	Gross Alpha/Beta	Gross Beta	1.247E-14	1.634E-15	1.469E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141285	BAP-001	06/18/12	Gross Alpha/Beta	Gross Alpha	1.822E-15	7.16E-16	4.89E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141285	BAP-001	06/18/12	Gross Alpha/Beta	Gross Beta	1.748E-14	1.877E-15	1.484E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141286	BAP-001	06/24/12	Gross Alpha/Beta	Gross Alpha	1.141E-15	6.54E-16	5.96E-16	µCi/mL	J	T04	HISS Air (Particulate Air)-Environmental Monitoring
HIS141286	BAP-001	06/24/12	Gross Alpha/Beta	Gross Beta	1.499E-14	1.992E-15	1.806E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141287	BAP-001	07/02/12	Gross Alpha/Beta	Gross Alpha	6.963E-15	1.367E-15	5.32E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141287	BAP-001	07/02/12	Gross Alpha/Beta	Gross Beta	2.105E-14	2.09E-15	1.422E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141288	BAP-001	07/09/12	Gross Alpha/Beta	Gross Alpha	5.888E-15	1.242E-15	5.17E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141288	BAP-001	07/09/12	Gross Alpha/Beta	Gross Beta	2.322E-14	2.141E-15	1.383E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141289	BAP-001	07/16/12	Gross Alpha/Beta	Gross Alpha	5.58E-15	1.204E-15	5.12E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141289	BAP-001	07/16/12	Gross Alpha/Beta	Gross Beta	1.646E-14	1.853E-15	1.369E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141290	BAP-001	07/23/12	Gross Alpha/Beta	Gross Alpha	5.13E-15	1.154E-15	5.11E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141290	BAP-001	07/23/12	Gross Alpha/Beta	Gross Beta	1.725E-14	1.884E-15	1.366E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141291	BAP-001	07/30/12	Gross Alpha/Beta	Gross Alpha	4.258E-15	1.047E-15	5.04E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141291	BAP-001	07/30/12	Gross Alpha/Beta	Gross Beta	1.665E-14	1.842E-15	1.346E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141293	BAP-001	08/13/12	Gross Alpha/Beta	Gross Alpha	3.685E-15	1.009E-15	5.36E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141293	BAP-001	08/13/12	Gross Alpha/Beta	Gross Beta	2.026E-14	2.068E-15	1.433E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141294	BAP-001	08/20/12	Gross Alpha/Beta	Gross Alpha	4.166E-15	1.032E-15	5E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141294	BAP-001	08/20/12	Gross Alpha/Beta	Gross Beta	2.467E-14	2.153E-15	1.336E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141295	BAP-001	08/27/12	Gross Alpha/Beta	Gross Alpha	3.996E-15	1.005E-15	4.94E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141295	BAP-001	08/27/12	Gross Alpha/Beta	Gross Beta	2.674E-14	2.214E-15	1.32E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141296	BAP-001	09/04/12	Gross Alpha/Beta	Gross Alpha	3.416E-15	8.59E-16	4.22E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141296	BAP-001	09/04/12	Gross Alpha/Beta	Gross Beta	1.924E-14	1.759E-15	1.129E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141297	BAP-001	09/10/12	Gross Alpha/Beta	Gross Alpha	1.606E-15	7.24E-16	5.88E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141297	BAP-001	09/10/12	Gross Alpha/Beta	Gross Beta	1.895E-14	2.129E-15	1.572E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141298	BAP-001	09/17/12	Gross Alpha/Beta	Gross Alpha	1.599E-15	6.87E-16	5.38E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141298	BAP-001	09/17/12	Gross Alpha/Beta	Gross Beta	2.33E-14	2.193E-15	1.437E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141299	BAP-001	09/24/12	Gross Alpha/Beta	Gross Alpha	1.136E-15	5.55E-16	4.8E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141299	BAP-001	09/24/12	Gross Alpha/Beta	Gross Beta	1.973E-14	1.916E-15	1.283E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141300	BAP-001	10/01/12	Gross Alpha/Beta	Gross Alpha	6.359E-15	1.294E-15	4.97E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141300	BAP-001	10/01/12	Gross Alpha/Beta	Gross Beta	2.099E-14	2.008E-15	1.334E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141301	BAP-001	10/08/12	Gross Alpha/Beta	Gross Alpha	6.569E-15	1.355E-15	5.28E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141301	BAP-001	10/08/12	Gross Alpha/Beta	Gross Beta	2.183E-14	2.115E-15	1.418E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141302	BAP-001	10/15/12	Gross Alpha/Beta	Gross Alpha	7.838E-15	1.446E-15	5.01E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141302	BAP-001	10/15/12	Gross Alpha/Beta	Gross Beta	2.833E-14	2.278E-15	1.344E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141303	BAP-001	10/22/12	Gross Alpha/Beta	Gross Alpha	6.563E-15	1.38E-15	5.49E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141303	BAP-001	10/22/12	Gross Alpha/Beta	Gross Beta	2.185E-14	2.166E-15	1.473E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

Table B-1. Background Air Particulate Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
HIS141304	BAP-001	10/29/12	Gross Alpha/Beta	Gross Alpha	5.324E-15	1.2E-15	5.12E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141304	BAP-001	10/29/12	Gross Alpha/Beta	Gross Beta	1.966E-14	1.991E-15	1.373E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141305	BAP-001	11/05/12	Gross Alpha/Beta	Gross Alpha	5.94E-15	1.316E-15	5.52E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141305	BAP-001	11/05/12	Gross Alpha/Beta	Gross Beta	1.932E-14	2.072E-15	1.481E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141306	BAP-001	11/13/12	Gross Alpha/Beta	Gross Alpha	5.061E-15	1.07E-15	4.28E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141306	BAP-001	11/13/12	Gross Alpha/Beta	Gross Beta	2.276E-14	1.896E-15	1.147E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141307	BAP-001	11/19/12	Gross Alpha/Beta	Gross Alpha	6.938E-15	1.474E-15	5.92E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141307	BAP-001	11/19/12	Gross Alpha/Beta	Gross Beta	3.372E-14	2.701E-15	1.589E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141308	BAP-001	11/26/12	Gross Alpha/Beta	Gross Alpha	8.031E-15	1.476E-15	5.09E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141308	BAP-001	11/26/12	Gross Alpha/Beta	Gross Beta	4.369E-14	2.773E-15	1.366E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141309	BAP-001	12/03/12	Gross Alpha/Beta	Gross Alpha	5.305E-15	1.209E-15	5.22E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141309	BAP-001	12/03/12	Gross Alpha/Beta	Gross Beta	3.221E-14	2.462E-15	1.4E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141310	BAP-001	12/10/12	Gross Alpha/Beta	Gross Alpha	3.855E-15	1.015E-15	5.03E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141310	BAP-001	12/10/12	Gross Alpha/Beta	Gross Beta	2.338E-14	2.111E-15	1.35E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141311	BAP-001	12/17/12	Gross Alpha/Beta	Gross Alpha	3.044E-15	9.52E-16	5.52E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141311	BAP-001	12/17/12	Gross Alpha/Beta	Gross Beta	2.577E-14	2.32E-15	1.481E-15	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141312	BAP-001	12/27/12	Gross Alpha/Beta	Gross Alpha	2.088E-15	6.31E-16	3.55E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring
HIS141312	BAP-001	12/27/12	Gross Alpha/Beta	Gross Beta	3.25E-14	1.991E-15	9.54E-16	µCi/mL	=		HISS Air (Particulate Air)-Environmental Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141348	SLAPS Loadout	01/03/12	Gross Alpha/Beta	Gross Alpha	8.899E-15	8.828E-15	1.263E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	1.816E-14	1.424E-14	2.062E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141349	SLAPS Loadout	01/03/12	Gross Alpha/Beta	Gross Alpha	-2.28E-16	5.801E-15	1.329E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.701E-14	1.589E-14	2.169E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141350	SLAPS Loadout	01/03/12	Gross Alpha/Beta	Gross Alpha	-2.06E-16	5.244E-15	1.201E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.33E-14	1.307E-14	1.961E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141351	SLAPS Loadout	01/03/12	Gross Alpha/Beta	Gross Alpha	-1.551E-15	4.962E-15	1.289E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.365E-14	1.513E-14	2.105E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141352	SLAPS Loadout	01/03/12	Gross Alpha/Beta	Gross Alpha	3.907E-15	7.545E-15	1.337E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.039E-14	1.4E-14	2.183E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141353	SLAPS Loadout	01/04/12	Gross Alpha/Beta	Gross Alpha	-2.632E-15	3.827E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.55E-14	1.425E-14	1.923E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141354	SLAPS Loadout	01/04/12	Gross Alpha/Beta	Gross Alpha	3.442E-15	6.645E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.55E-14	1.425E-14	1.923E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141355	SLAPS Loadout	01/04/12	Gross Alpha/Beta	Gross Alpha	3.442E-15	6.645E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.927E-15	1.243E-14	1.923E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141356	SLAPS Loadout	01/04/12	Gross Alpha/Beta	Gross Alpha	-2.24E-16	5.691E-15	1.303E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.028E-14	1.705E-14	2.128E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141357	SLAPS Loadout	01/04/12	Gross Alpha/Beta	Gross Alpha	5.664E-15	7.218E-15	1.136E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.263E-14	1.561E-14	1.855E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141358	SLAPS Loadout	01/05/12	Gross Alpha/Beta	Gross Alpha	-1.304E-15	4.172E-15	1.084E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.415E-14	1.206E-14	1.77E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141359	SLAPS Loadout	01/05/12	Gross Alpha/Beta	Gross Alpha	6.823E-15	7.575E-15	1.134E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.055E-14	1.437E-14	1.852E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141360	SLAPS Loadout	01/05/12	Gross Alpha/Beta	Gross Alpha	5.653E-15	7.205E-15	1.134E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.88E-14	1.521E-14	1.852E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141361	SLAPS Loadout	01/05/12	Gross Alpha/Beta	Gross Alpha	-2.27E-16	5.777E-15	1.323E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.728E-14	1.472E-14	2.16E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141362	SLAPS Loadout	01/05/12	Gross Alpha/Beta	Gross Alpha	-3.546E-15	2.728E-15	1.086E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.633E-14	1.233E-14	1.773E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141363	SLAPS Loadout	01/11/12	Gross Alpha/Beta	Gross Alpha	8.061E-15	7.691E-15	9.596E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.811E-15	1.834E-14	2.716E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141364	SLAPS Loadout	01/11/12	Gross Alpha/Beta	Gross Alpha	5.642E-15	6.888E-15	9.596E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.647E-14	2.239E-14	2.716E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141365	SLAPS Loadout	01/11/12	Gross Alpha/Beta	Gross Alpha	9.212E-15	8.789E-15	1.097E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.614E-14	2.429E-14	3.104E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141366	SLAPS Loadout	01/11/12	Gross Alpha/Beta	Gross Alpha	5.589E-15	6.822E-15	9.505E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.124E-14	2.254E-14	2.69E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141367	SLAPS Loadout	01/11/12	Gross Alpha/Beta	Gross Alpha	1.169E-14	8.758E-15	9.596E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	7.946E-14	2.392E-14	2.716E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141368	SLAPS Loadout	01/10/12	Gross Alpha/Beta	Gross Alpha	-1.552E-15	3.384E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.821E-14	1.891E-14	2.615E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141369	SLAPS Loadout	01/10/12	Gross Alpha/Beta	Gross Alpha	5.384E-15	6.572E-15	9.156E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.462E-14	1.924E-14	2.591E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141370	SLAPS Loadout	01/10/12	Gross Alpha/Beta	Gross Alpha	5.589E-15	6.822E-15	9.505E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.847E-14	2.094E-14	2.69E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141371	SLAPS Loadout	01/10/12	Gross Alpha/Beta	Gross Alpha	8.4E-16	5.112E-15	1.001E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.611E-14	2.097E-14	2.832E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141372	SLAPS Loadout	01/10/12	Gross Alpha/Beta	Gross Alpha	-3.85E-16	4.07E-15	9.156E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.995E-15	1.81E-14	2.591E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141373	SLAPS Loadout	01/09/12	Gross Alpha/Beta	Gross Alpha	6.21E-15	7.58E-15	1.056E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.49E-14	2.115E-14	2.989E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141374	SLAPS Loadout	01/09/12	Gross Alpha/Beta	Gross Alpha	8.926E-15	7.764E-15	9.241E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.699E-14	2.104E-14	2.615E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141375	SLAPS Loadout	01/09/12	Gross Alpha/Beta	Gross Alpha	1.941E-15	5.265E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.076E-14	1.987E-14	2.615E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141376	SLAPS Loadout	01/09/12	Gross Alpha/Beta	Gross Alpha	1.941E-15	5.265E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.747E-14	1.885E-14	2.615E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141377	SLAPS Loadout	01/09/12	Gross Alpha/Beta	Gross Alpha	7.68E-16	4.67E-15	9.139E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.874E-14	1.876E-14	2.587E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141378	SLAPS Loadout	01/12/12	Gross Alpha/Beta	Gross Alpha	6.113E-15	7.041E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.163E-14	1.915E-14	2.831E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141379	SLAPS Loadout	01/12/12	Gross Alpha/Beta	Gross Alpha	-4.03E-16	3.605E-15	9.596E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.303E-14	1.787E-14	2.613E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141380	SLAPS Loadout	01/12/12	Gross Alpha/Beta	Gross Alpha	8.22E-16	4.426E-15	9.784E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.767E-14	2.097E-14	2.664E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141381	SLAPS Loadout	01/12/12	Gross Alpha/Beta	Gross Alpha	4.476E-15	6.091E-15	9.689E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.56E-14	1.988E-14	2.638E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141382	SLAPS Loadout	01/16/12	Gross Alpha/Beta	Gross Alpha	6.251E-15	6.327E-15	8.755E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.126E-14	1.866E-14	2.384E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141383	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	-3.72E-16	3.324E-15	8.848E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.746E-14	1.854E-14	2.409E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141384	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	5.589E-15	6.437E-15	9.505E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.998E-14	2.137E-14	2.588E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141385	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	2.015E-15	4.969E-15	9.596E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.836E-14	1.914E-14	2.613E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141386	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	-3.99E-16	3.571E-15	9.505E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.1E-14	1.997E-14	2.588E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141387	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	7.55E-16	4.067E-15	8.991E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.95E-14	1.895E-14	2.448E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141388	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	4.269E-15	5.809E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.026E-14	1.867E-14	2.516E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141389	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	-1.552E-15	2.575E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.402E-14	1.734E-14	2.516E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141390	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	7.76E-16	4.18E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.979E-14	2.088E-14	2.516E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141391	SLAPS Loadout	01/18/12	Gross Alpha/Beta	Gross Alpha	3.417E-15	6.605E-15	1.051E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.907E-14	1.385E-14	1.692E-14	µCi/mL	=		SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141392	SLAPS Loadout	01/18/12	Gross Alpha/Beta	Gross Alpha	5.633E-15	7.311E-15	1.051E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.486E-14	1.23E-14	1.692E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141393	SLAPS Loadout	01/19/12	Gross Alpha/Beta	Gross Alpha	6.104E-15	7.923E-15	1.139E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.31E-14	1.402E-14	1.833E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141394	SLAPS Loadout	01/19/12	Gross Alpha/Beta	Gross Alpha	7.223E-15	8.186E-15	1.126E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.338E-14	1.499E-14	1.812E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141395	SLAPS Loadout	01/19/12	Gross Alpha/Beta	Gross Alpha	3.613E-15	6.984E-15	1.111E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.103E-14	1.238E-14	1.789E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141396	SLAPS Loadout	01/19/12	Gross Alpha/Beta	Gross Alpha	6.07E-15	7.878E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.281E-14	1.599E-14	1.823E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141397	SLAPS Loadout	01/23/12	Gross Alpha/Beta	Gross Alpha	3.627E-15	7.01E-15	1.115E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.524E-14	1.508E-14	1.796E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141398	SLAPS Loadout	01/23/12	Gross Alpha/Beta	Gross Alpha	1.244E-15	6.024E-15	1.089E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.496E-14	1.918E-14	1.753E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141399	SLAPS Loadout	01/23/12	Gross Alpha/Beta	Gross Alpha	3.593E-15	6.946E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.631E-14	1.509E-14	1.779E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141400	SLAPS Loadout	01/12/12	Gross Alpha/Beta	Gross Alpha	-4.37E-16	3.905E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.564E-14	2.265E-14	2.831E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141401	SLAPS Loadout	01/23/12	Gross Alpha/Beta	Gross Alpha	5.556E-15	6.203E-15	9.173E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.829E-14	1.71E-14	1.811E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141402	SLAPS Loadout	01/23/12	Gross Alpha/Beta	Gross Alpha	9.696E-15	7.363E-15	8.69E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	5.025E-14	1.575E-14	1.716E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141403	SLAPS Loadout	01/24/12	Gross Alpha/Beta	Gross Alpha	5.556E-15	6.203E-15	9.173E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.705E-14	1.607E-14	1.811E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141404	SLAPS Loadout	01/24/12	Gross Alpha/Beta	Gross Alpha	4.386E-15	5.744E-15	9.173E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.455E-14	1.38E-14	1.811E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141405	SLAPS Loadout	01/24/12	Gross Alpha/Beta	Gross Alpha	5.535E-15	6.18E-15	9.139E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.658E-14	1.69E-14	1.805E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141406	SLAPS Loadout	01/24/12	Gross Alpha/Beta	Gross Alpha	4.268E-15	5.589E-15	8.925E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.286E-14	1.536E-14	1.762E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141407	SLAPS Loadout	01/17/12	Gross Alpha/Beta	Gross Alpha	1.842E-14	9.942E-15	9.173E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	1.1E-13	2.12E-14	1.811E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141408	SLAPS Loadout	01/25/12	Gross Alpha/Beta	Gross Alpha	1.009E-14	9.945E-15	1.376E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.583E-14	2.166E-14	2.717E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141409	SLAPS Loadout	01/25/12	Gross Alpha/Beta	Gross Alpha	1.236E-14	1.101E-14	1.436E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	5.486E-14	2.332E-14	2.835E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141410	SLAPS Loadout	01/25/12	Gross Alpha/Beta	Gross Alpha	3.35E-15	7.683E-15	1.501E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.981E-14	2.463E-14	2.964E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141411	SLAPS Loadout	01/25/12	Gross Alpha/Beta	Gross Alpha	9.092E-15	1.015E-14	1.501E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.368E-14	2.401E-14	2.964E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141412	SLAPS Loadout	01/25/12	Gross Alpha/Beta	Gross Alpha	1.436E-15	6.661E-15	1.501E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-3.07E-16	1.763E-14	2.964E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141413	SLAPS Loadout	01/26/12	Gross Alpha/Beta	Gross Alpha	5.556E-15	6.203E-15	9.173E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.559E-15	1.206E-14	1.811E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141414	SLAPS Loadout	01/26/12	Gross Alpha/Beta	Gross Alpha	3.309E-15	5.396E-15	9.435E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.145E-14	1.586E-14	1.863E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141415	SLAPS Loadout	01/26/12	Gross Alpha/Beta	Gross Alpha	3.217E-15	5.246E-15	9.173E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.706E-14	1.296E-14	1.811E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141416	SLAPS Loadout	01/26/12	Gross Alpha/Beta	Gross Alpha	9.02E-16	4.187E-15	9.435E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.523E-14	1.306E-14	1.863E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141417	SLAPS Loadout	01/26/12	Gross Alpha/Beta	Gross Alpha	1.024E-14	7.772E-15	9.173E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	1.256E-14	1.242E-14	1.811E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141418	SLAPS Loadout	01/31/12	Gross Alpha/Beta	Gross Alpha	4.311E-15	6.803E-15	1.087E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.889E-14	1.353E-14	1.889E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141419	SLAPS Loadout	01/31/12	Gross Alpha/Beta	Gross Alpha	6.99E-16	5.355E-15	1.083E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.417E-14	1.612E-14	1.882E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141420	SLAPS Loadout	01/31/12	Gross Alpha/Beta	Gross Alpha	6.82E-16	5.226E-15	1.057E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.872E-15	1.189E-14	1.837E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141421	SLAPS Loadout	01/31/12	Gross Alpha/Beta	Gross Alpha	6.82E-16	5.226E-15	1.057E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.162E-14	1.236E-14	1.837E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141422	SLAPS Loadout	01/31/12	Gross Alpha/Beta	Gross Alpha	-1.688E-15	4.122E-15	1.077E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.934E-14	1.558E-14	1.871E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141423	SLAPS Loadout	02/01/12	Gross Alpha/Beta	Gross Alpha	2.94E-15	6.019E-15	1.028E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.903E-14	1.503E-14	1.787E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141424	SLAPS Loadout	02/01/12	Gross Alpha/Beta	Gross Alpha	-4.83E-16	4.63E-15	1.047E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-6.314E-15	9.843E-15	1.82E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141425	SLAPS Loadout	02/01/12	Gross Alpha/Beta	Gross Alpha	-4.92E-16	4.717E-15	1.067E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.097E-14	1.238E-14	1.854E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141426	SLAPS Loadout	02/01/12	Gross Alpha/Beta	Gross Alpha	-1.657E-15	4.046E-15	1.057E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.123E-15	1.18E-14	1.837E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141427	SLAPS Loadout	02/02/12	Gross Alpha/Beta	Gross Alpha	7.02E-16	5.375E-15	1.087E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.044E-14	1.37E-14	1.889E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141428	SLAPS Loadout	02/02/12	Gross Alpha/Beta	Gross Alpha	6.46E-16	4.951E-15	1.001E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.516E-14	1.435E-14	1.74E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141429	SLAPS Loadout	02/02/12	Gross Alpha/Beta	Gross Alpha	4.378E-15	6.908E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.407E-14	1.535E-14	1.919E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141430	SLAPS Loadout	02/02/12	Gross Alpha/Beta	Gross Alpha	4.386E-15	6.921E-15	1.106E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.393E-14	1.429E-14	1.922E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141431	SLAPS Loadout	02/02/12	Gross Alpha/Beta	Gross Alpha	7.11E-16	5.448E-15	1.102E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.207E-15	1.24E-14	1.915E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141432	SLAPS Loadout	02/01/12	Gross Alpha/Beta	Gross Alpha	2.863E-15	5.86E-15	1.001E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.445E-14	1.428E-14	1.74E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141433	SLAPS Loadout	02/06/12	Gross Alpha/Beta	Gross Alpha	4.192E-15	5.532E-15	8.263E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.663E-14	1.831E-14	2.599E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141434	SLAPS Loadout	02/06/12	Gross Alpha/Beta	Gross Alpha	7.568E-15	6.723E-15	8.034E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.635E-14	1.786E-14	2.527E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141435	SLAPS Loadout	02/06/12	Gross Alpha/Beta	Gross Alpha	4.192E-15	5.532E-15	8.263E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.3E-15	1.588E-14	2.599E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141436	SLAPS Loadout	02/06/12	Gross Alpha/Beta	Gross Alpha	2.994E-15	4.986E-15	8.263E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.297E-14	1.714E-14	2.599E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141437	SLAPS Loadout	02/06/12	Gross Alpha/Beta	Gross Alpha	2.994E-15	4.986E-15	8.263E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.043E-14	1.862E-14	2.599E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141438	SLAPS Loadout	02/07/12	Gross Alpha/Beta	Gross Alpha	1.886E-15	4.592E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.999E-14	2.094E-14	2.729E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141439	SLAPS Loadout	02/07/12	Gross Alpha/Beta	Gross Alpha	3.082E-15	5.133E-15	8.506E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.943E-14	1.98E-14	2.675E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141440	SLAPS Loadout	02/07/12	Gross Alpha/Beta	Gross Alpha	8.256E-15	7.335E-15	8.764E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	5.254E-14	2.053E-14	2.756E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141441	SLAPS Loadout	02/07/12	Gross Alpha/Beta	Gross Alpha	4.401E-15	5.808E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.049E-14	1.855E-14	2.729E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141442	SLAPS Loadout	02/07/12	Gross Alpha/Beta	Gross Alpha	6.16E-16	3.766E-15	8.506E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.49E-14	2.023E-14	2.675E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141443	SLAPS Loadout	02/08/12	Gross Alpha/Beta	Gross Alpha	5.52E-16	3.37E-15	7.611E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.416E-14	1.515E-14	2.394E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141444	SLAPS Loadout	02/08/12	Gross Alpha/Beta	Gross Alpha	4.075E-15	5.378E-15	8.034E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.159E-14	1.659E-14	2.527E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141445	SLAPS Loadout	02/08/12	Gross Alpha/Beta	Gross Alpha	5.82E-16	3.557E-15	8.034E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.454E-14	1.686E-14	2.527E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141446	SLAPS Loadout	02/08/12	Gross Alpha/Beta	Gross Alpha	7.568E-15	6.723E-15	8.034E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.488E-14	1.774E-14	2.527E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141447	SLAPS Loadout	02/08/12	Gross Alpha/Beta	Gross Alpha	1.715E-15	4.174E-15	7.888E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.41E-14	1.655E-14	2.481E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141448	SLAPS Loadout	02/09/12	Gross Alpha/Beta	Gross Alpha	5.64E-16	3.449E-15	7.789E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.453E-14	1.726E-14	2.45E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141449	SLAPS Loadout	02/09/12	Gross Alpha/Beta	Gross Alpha	4.038E-15	5.329E-15	7.96E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.26E-14	1.824E-14	2.503E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141450	SLAPS Loadout	02/09/12	Gross Alpha/Beta	Gross Alpha	6.345E-15	6.249E-15	7.96E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.505E-14	1.676E-14	2.503E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141451	SLAPS Loadout	02/09/12	Gross Alpha/Beta	Gross Alpha	6.345E-15	6.249E-15	7.96E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.871E-14	1.708E-14	2.503E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141452	SLAPS Loadout	02/09/12	Gross Alpha/Beta	Gross Alpha	2.782E-15	4.633E-15	7.678E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.416E-14	1.617E-14	2.415E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141453	SLAPS Loadout	02/13/12	Gross Alpha/Beta	Gross Alpha	2.077E-15	5.057E-15	9.556E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.602E-14	1.886E-14	3.005E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141454	SLAPS Loadout	02/13/12	Gross Alpha/Beta	Gross Alpha	-6.76E-16	3.123E-15	9.329E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.564E-14	1.841E-14	2.934E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141455	SLAPS Loadout	02/13/12	Gross Alpha/Beta	Gross Alpha	5.982E-15	6.691E-15	9.172E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.897E-14	2.018E-14	2.885E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141456	SLAPS Loadout	02/13/12	Gross Alpha/Beta	Gross Alpha	-7.48E-16	3.457E-15	1.033E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.301E-14	2.091E-14	3.249E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141457	SLAPS Loadout	02/13/12	Gross Alpha/Beta	Gross Alpha	3.38E-15	5.63E-15	9.329E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.679E-14	1.942E-14	2.934E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141458	SLAPS Loadout	02/14/12	Gross Alpha/Beta	Gross Alpha	6.29E-16	3.842E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.73E-14	1.827E-14	2.729E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141459	SLAPS Loadout	02/14/12	Gross Alpha/Beta	Gross Alpha	1.886E-15	4.592E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.694E-14	1.734E-14	2.729E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141460	SLAPS Loadout	02/14/12	Gross Alpha/Beta	Gross Alpha	-6.29E-16	2.904E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.779E-15	1.628E-14	2.729E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141461	SLAPS Loadout	02/14/12	Gross Alpha/Beta	Gross Alpha	6.29E-16	3.842E-15	8.676E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.056E-14	1.675E-14	2.729E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141462	SLAPS Loadout	02/14/12	Gross Alpha/Beta	Gross Alpha	-4.54E-16	4.548E-15	9.84E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.457E-15	1.181E-14	1.658E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141463	SLAPS Loadout	02/15/12	Gross Alpha/Beta	Gross Alpha	5.525E-15	7.377E-15	1.089E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.183E-14	1.471E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141464	SLAPS Loadout	02/15/12	Gross Alpha/Beta	Gross Alpha	1.818E-15	5.793E-15	1.038E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.595E-14	1.455E-14	1.748E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141465	SLAPS Loadout	02/15/12	Gross Alpha/Beta	Gross Alpha	1.842E-15	5.868E-15	1.051E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.598E-14	1.569E-14	1.771E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141466	SLAPS Loadout	02/15/12	Gross Alpha/Beta	Gross Alpha	4.184E-15	6.753E-15	1.055E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.835E-14	1.596E-14	1.777E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141467	SLAPS Loadout	02/15/12	Gross Alpha/Beta	Gross Alpha	2.994E-15	6.289E-15	1.047E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.767E-14	1.483E-14	1.764E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141468	SLAPS Loadout	02/16/12	Gross Alpha/Beta	Gross Alpha	1.081E-14	8.553E-15	1.019E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	5.947E-14	1.741E-14	1.717E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141469	SLAPS Loadout	02/16/12	Gross Alpha/Beta	Gross Alpha	7.412E-15	7.592E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.152E-14	1.756E-14	1.714E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141470	SLAPS Loadout	02/16/12	Gross Alpha/Beta	Gross Alpha	4.034E-15	6.512E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.08E-14	1.75E-14	1.714E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141471	SLAPS Loadout	02/16/12	Gross Alpha/Beta	Gross Alpha	6.4E-15	7.381E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.999E-14	1.848E-14	1.745E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141472	SLAPS Loadout	02/16/12	Gross Alpha/Beta	Gross Alpha	4.115E-15	6.642E-15	1.038E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.95E-14	1.677E-14	1.748E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141473	SLAPS Loadout	02/20/12	Gross Alpha/Beta	Gross Alpha	1.361E-15	5.744E-15	1.017E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.377E-15	1.242E-14	1.662E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141474	SLAPS Loadout	02/20/12	Gross Alpha/Beta	Gross Alpha	6.962E-15	7.705E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.214E-14	1.415E-14	1.701E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141475	SLAPS Loadout	02/20/12	Gross Alpha/Beta	Gross Alpha	8.076E-15	8.021E-15	1.04E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.356E-14	1.526E-14	1.701E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141476	SLAPS Loadout	02/20/12	Gross Alpha/Beta	Gross Alpha	-8.37E-16	4.968E-15	1.042E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.931E-14	1.388E-14	1.704E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141477	SLAPS Loadout	02/20/12	Gross Alpha/Beta	Gross Alpha	-8.33E-16	4.941E-15	1.037E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.135E-14	1.403E-14	1.695E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141478	SLAPS Loadout	02/21/12	Gross Alpha/Beta	Gross Alpha	2.429E-15	6.09E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.007E-14	1.357E-14	1.648E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141479	SLAPS Loadout	02/21/12	Gross Alpha/Beta	Gross Alpha	5.767E-15	7.272E-15	1.026E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.309E-14	1.505E-14	1.677E-14	µCi/mL	=		SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141480	SLAPS Loadout	02/21/12	Gross Alpha/Beta	Gross Alpha	3.57E-15	6.574E-15	1.026E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.746E-14	1.451E-14	1.677E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141481	SLAPS Loadout	02/21/12	Gross Alpha/Beta	Gross Alpha	9.062E-15	8.21E-15	1.026E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.746E-14	1.451E-14	1.677E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141482	SLAPS Loadout	02/21/12	Gross Alpha/Beta	Gross Alpha	5.818E-15	7.336E-15	1.035E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.35E-14	1.318E-14	1.692E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141483	SLAPS Loadout	02/22/12	Gross Alpha/Beta	Gross Alpha	7.895E-15	7.841E-15	1.017E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	1.745E-14	1.34E-14	1.662E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141484	SLAPS Loadout	02/22/12	Gross Alpha/Beta	Gross Alpha	9.142E-15	8.282E-15	1.035E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	1.208E-14	1.303E-14	1.692E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141485	SLAPS Loadout	02/22/12	Gross Alpha/Beta	Gross Alpha	8.034E-15	7.979E-15	1.035E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.48E-14	1.532E-14	1.692E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141486	SLAPS Loadout	02/22/12	Gross Alpha/Beta	Gross Alpha	1.385E-15	5.844E-15	1.035E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.918E-14	1.378E-14	1.692E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141487	SLAPS Loadout	02/22/12	Gross Alpha/Beta	Gross Alpha	1.043E-14	8.727E-15	1.053E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.037E-14	1.511E-14	1.722E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141488	SLAPS Loadout	02/23/12	Gross Alpha/Beta	Gross Alpha	1.436E-15	6.057E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.429E-14	1.474E-14	1.753E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141489	SLAPS Loadout	02/23/12	Gross Alpha/Beta	Gross Alpha	6.029E-15	7.603E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.871E-14	1.517E-14	1.753E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141490	SLAPS Loadout	02/23/12	Gross Alpha/Beta	Gross Alpha	1.41E-15	5.949E-15	1.053E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.892E-14	1.497E-14	1.722E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141491	SLAPS Loadout	02/23/12	Gross Alpha/Beta	Gross Alpha	1.072E-14	8.967E-15	1.082E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.452E-14	1.487E-14	1.769E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141492	SLAPS Loadout	02/23/12	Gross Alpha/Beta	Gross Alpha	3.794E-15	6.003E-15	8.803E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.119E-14	1.624E-14	2.494E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141493	SLAPS Loadout	02/27/12	Gross Alpha/Beta	Gross Alpha	6.322E-15	7.148E-15	9.334E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.453E-14	1.976E-14	2.644E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141494	SLAPS Loadout	02/27/12	Gross Alpha/Beta	Gross Alpha	2.874E-15	5.936E-15	9.334E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.437E-15	1.581E-14	2.644E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141495	SLAPS Loadout	02/27/12	Gross Alpha/Beta	Gross Alpha	8.13E-15	7.406E-15	8.803E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.7E-14	1.753E-14	2.494E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141496	SLAPS Loadout	02/27/12	Gross Alpha/Beta	Gross Alpha	-5.52E-16	4.224E-15	8.957E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.597E-14	1.605E-14	2.537E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141497	SLAPS Loadout	02/27/12	Gross Alpha/Beta	Gross Alpha	5.7E-16	4.921E-15	9.249E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.443E-14	1.725E-14	2.62E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141498	SLAPS Loadout	02/28/12	Gross Alpha/Beta	Gross Alpha	2.782E-15	5.747E-15	9.036E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.022E-14	1.738E-14	2.56E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141499	SLAPS Loadout	02/28/12	Gross Alpha/Beta	Gross Alpha	1.28E-14	8.812E-15	9.036E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	3.092E-14	1.743E-14	2.56E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141500	SLAPS Loadout	02/28/12	Gross Alpha/Beta	Gross Alpha	3.895E-15	6.163E-15	9.036E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.362E-14	1.844E-14	2.56E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141501	SLAPS Loadout	02/28/12	Gross Alpha/Beta	Gross Alpha	-5.56E-16	4.262E-15	9.036E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.669E-14	1.709E-14	2.56E-14	µCi/mL	J	T04	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141502	SLAPS Loadout	02/28/12	Gross Alpha/Beta	Gross Alpha	3.794E-15	6.003E-15	8.803E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.15E-14	1.709E-14	2.494E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141503	SLAPS Loadout	02/29/12	Gross Alpha/Beta	Gross Alpha	2.515E-15	7.982E-15	1.362E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.152E-14	2.325E-14	3.857E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141504	SLAPS Loadout	02/29/12	Gross Alpha/Beta	Gross Alpha	2.096E-15	6.652E-15	1.135E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.288E-14	2.056E-14	3.214E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141505	SLAPS Loadout	02/29/12	Gross Alpha/Beta	Gross Alpha	4.585E-15	7.254E-15	1.064E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.474E-14	2.039E-14	3.013E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141506	SLAPS Loadout	02/29/12	Gross Alpha/Beta	Gross Alpha	7.676E-15	9.757E-15	1.276E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.179E-14	1.471E-14	2.148E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141507	SLAPS Loadout	02/29/12	Gross Alpha/Beta	Gross Alpha	3.713E-15	8.59E-15	1.271E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.33E-14	1.365E-14	2.139E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141508	SLAPS Loadout	03/01/12	Gross Alpha/Beta	Gross Alpha	4.526E-15	8.091E-15	1.145E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.652E-14	1.284E-14	1.927E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141509	SLAPS Loadout	03/01/12	Gross Alpha/Beta	Gross Alpha	9.68E-16	6.865E-15	1.126E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.146E-14	1.323E-14	1.895E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141510	SLAPS Loadout	03/01/12	Gross Alpha/Beta	Gross Alpha	-3.663E-15	5.038E-15	1.122E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.471E-14	1.241E-14	1.888E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA141511	SLAPS Loadout	03/01/12	Gross Alpha/Beta	Gross Alpha	3.29E-15	7.611E-15	1.126E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.89E-14	1.405E-14	1.895E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141512	SLAPS Loadout	03/01/12	Gross Alpha/Beta	Gross Alpha	3.112E-15	7.201E-15	1.065E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.889E-14	1.236E-14	1.793E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA141513	SLAPS Loadout	03/05/12	Gross Alpha/Beta	Gross Alpha	1.669E-15	5.298E-15	9.036E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.526E-15	1.524E-14	2.56E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141514	SLAPS Loadout	03/05/12	Gross Alpha/Beta	Gross Alpha	2.858E-15	5.903E-15	9.283E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.582E-14	1.657E-14	2.63E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141515	SLAPS Loadout	03/05/12	Gross Alpha/Beta	Gross Alpha	-1.715E-15	3.734E-15	9.283E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.075E-14	1.612E-14	2.63E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141516	SLAPS Loadout	03/05/12	Gross Alpha/Beta	Gross Alpha	1.796E-15	5.702E-15	9.725E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.278E-14	1.702E-14	2.755E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141517	SLAPS Loadout	03/05/12	Gross Alpha/Beta	Gross Alpha	1.684E-15	5.345E-15	9.117E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.045E-14	1.833E-14	2.583E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA141518	SLAPS Loadout	03/06/12	Gross Alpha/Beta	Gross Alpha	3.506E-15	1.113E-14	1.898E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.346E-14	3.308E-14	5.377E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141519	SLAPS Loadout	03/06/12	Gross Alpha/Beta	Gross Alpha	5.931E-15	1.225E-14	1.927E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.774E-15	3.221E-14	5.458E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141520	SLAPS Loadout	03/06/12	Gross Alpha/Beta	Gross Alpha	-1.16E-15	8.885E-15	1.884E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-1.054E-14	2.966E-14	5.337E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141521	SLAPS Loadout	03/06/12	Gross Alpha/Beta	Gross Alpha	-1.16E-15	8.885E-15	1.884E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.696E-15	3.094E-14	5.337E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141522	SLAPS Loadout	03/06/12	Gross Alpha/Beta	Gross Alpha	1.16E-15	1.002E-14	1.884E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-2.45E-16	3.066E-14	5.337E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141523	SLAPS Loadout	03/07/12	Gross Alpha/Beta	Gross Alpha	-1.367E-15	1.047E-14	2.22E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-8.954E-15	3.528E-14	6.288E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA141524	SLAPS Loadout	03/07/12	Gross Alpha/Beta	Gross Alpha	1.186E-15	1.025E-14	1.927E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.93E-14	3.318E-14	5.458E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141525	SLAPS Loadout	03/07/12	Gross Alpha/Beta	Gross Alpha	4.1E-15	1.302E-14	2.22E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-1.069E-14	3.511E-14	6.288E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141526	SLAPS Loadout	03/07/12	Gross Alpha/Beta	Gross Alpha	6.834E-15	1.412E-14	2.22E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.184E-14	3.727E-14	6.288E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA141527	SLAPS Loadout	03/07/12	Gross Alpha/Beta	Gross Alpha	6.628E-15	1.533E-14	2.268E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.674E-14	2.473E-14	3.818E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142655	SLAPS Loadout	03/08/12	Gross Alpha/Beta	Gross Alpha	-2.19E-16	7.322E-15	1.276E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.022E-14	1.565E-14	2.148E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142656	SLAPS Loadout	03/08/12	Gross Alpha/Beta	Gross Alpha	2.144E-15	7.301E-15	1.134E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.286E-14	1.454E-14	1.909E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142657	SLAPS Loadout	03/08/12	Gross Alpha/Beta	Gross Alpha	5.044E-15	9.019E-15	1.276E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.263E-14	1.48E-14	2.148E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142658	SLAPS Loadout	03/08/12	Gross Alpha/Beta	Gross Alpha	2.339E-15	7.965E-15	1.237E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.195E-14	1.436E-14	2.083E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142659	SLAPS Loadout	03/08/12	Gross Alpha/Beta	Gross Alpha	3.314E-15	7.667E-15	1.134E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.262E-14	1.227E-14	1.909E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142660	SLAPS Loadout	03/12/12	Gross Alpha/Beta	Gross Alpha	4.64E-16	5.999E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.583E-14	1.232E-14	1.849E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142661	SLAPS Loadout	03/12/12	Gross Alpha/Beta	Gross Alpha	1.598E-15	6.479E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.904E-15	1.124E-14	1.872E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142662	SLAPS Loadout	03/12/12	Gross Alpha/Beta	Gross Alpha	4.7E-16	6.074E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.012E-15	1.086E-14	1.872E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142663	SLAPS Loadout	03/12/12	Gross Alpha/Beta	Gross Alpha	2.726E-15	6.861E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.747E-14	1.264E-14	1.872E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142664	SLAPS Loadout	03/12/12	Gross Alpha/Beta	Gross Alpha	-3.869E-15	3.894E-15	1.084E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.576E-15	1.049E-14	1.792E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142665	SLAPS Loadout	03/13/12	Gross Alpha/Beta	Gross Alpha	4.5E-16	5.814E-15	1.084E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.057E-14	1.36E-14	1.792E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142666	SLAPS Loadout	03/13/12	Gross Alpha/Beta	Gross Alpha	-6.58E-16	5.64E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.265E-14	1.428E-14	1.872E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142667	SLAPS Loadout	03/13/12	Gross Alpha/Beta	Gross Alpha	3.854E-15	7.223E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.061E-14	1.507E-14	1.872E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142668	SLAPS Loadout	03/13/12	Gross Alpha/Beta	Gross Alpha	2.726E-15	6.861E-15	1.132E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.193E-14	1.421E-14	1.872E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142669	SLAPS Loadout	03/13/12	Gross Alpha/Beta	Gross Alpha	6.023E-15	7.785E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.5E-14	1.624E-14	1.845E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142670	SLAPS Loadout	03/14/12	Gross Alpha/Beta	Gross Alpha	1.618E-15	6.561E-15	1.146E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.54E-16	1.07E-14	1.895E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142671	SLAPS Loadout	03/14/12	Gross Alpha/Beta	Gross Alpha	3.924E-15	7.354E-15	1.153E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.779E-14	1.287E-14	1.906E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142672	SLAPS Loadout	03/14/12	Gross Alpha/Beta	Gross Alpha	5.899E-15	7.624E-15	1.093E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.198E-14	1.163E-14	1.807E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142673	SLAPS Loadout	03/14/12	Gross Alpha/Beta	Gross Alpha	5.091E-15	7.733E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.25E-15	1.177E-14	1.913E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142674	SLAPS Loadout	03/14/12	Gross Alpha/Beta	Gross Alpha	3.62E-15	5.838E-15	8.394E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.144E-14	1.615E-14	2.595E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142675	SLAPS Loadout	03/15/12	Gross Alpha/Beta	Gross Alpha	3.587E-15	5.785E-15	8.318E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.843E-14	1.664E-14	2.571E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142676	SLAPS Loadout	03/15/12	Gross Alpha/Beta	Gross Alpha	4.678E-15	6.158E-15	8.244E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.892E-14	1.567E-14	2.548E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142677	SLAPS Loadout	03/15/12	Gross Alpha/Beta	Gross Alpha	1.265E-15	4.609E-15	7.959E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.552E-14	1.488E-14	2.46E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142678	SLAPS Loadout	03/15/12	Gross Alpha/Beta	Gross Alpha	5.62E-15	6.35E-15	7.987E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.178E-14	1.549E-14	2.469E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142679	SLAPS Loadout	03/19/12	Gross Alpha/Beta	Gross Alpha	1.808E-15	7.33E-15	1.281E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.408E-15	1.229E-14	2.118E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142680	SLAPS Loadout	03/19/12	Gross Alpha/Beta	Gross Alpha	-7.76E-16	6.649E-15	1.335E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.037E-14	1.368E-14	2.207E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142681	SLAPS Loadout	03/19/12	Gross Alpha/Beta	Gross Alpha	-1.923E-15	5.567E-15	1.219E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-2.206E-15	1.095E-14	2.016E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142682	SLAPS Loadout	03/19/12	Gross Alpha/Beta	Gross Alpha	-1.942E-15	5.621E-15	1.231E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.114E-14	1.281E-14	2.035E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142683	SLAPS Loadout	03/19/12	Gross Alpha/Beta	Gross Alpha	-3.138E-15	5.009E-15	1.219E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.804E-14	1.353E-14	2.016E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142684	SLAPS Loadout	03/20/12	Gross Alpha/Beta	Gross Alpha	6.221E-15	8.04E-15	1.153E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.147E-14	1.329E-14	1.906E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142685	SLAPS Loadout	03/20/12	Gross Alpha/Beta	Gross Alpha	-3.022E-15	4.823E-15	1.174E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.622E-15	1.185E-14	1.941E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142686	SLAPS Loadout	03/20/12	Gross Alpha/Beta	Gross Alpha	2.801E-15	7.05E-15	1.163E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.295E-15	1.183E-14	1.923E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142687	SLAPS Loadout	03/20/12	Gross Alpha/Beta	Gross Alpha	5.119E-15	7.775E-15	1.163E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.052E-14	1.211E-14	1.923E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142688	SLAPS Loadout	03/21/12	Gross Alpha/Beta	Gross Alpha	2.964E-15	7.461E-15	1.231E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.821E-14	1.366E-14	2.035E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142689	SLAPS Loadout	03/21/12	Gross Alpha/Beta	Gross Alpha	8.839E-15	9E-15	1.196E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.686E-14	1.429E-14	1.978E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142690	SLAPS Loadout	03/21/12	Gross Alpha/Beta	Gross Alpha	1.102E-14	9.434E-15	1.174E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.436E-14	1.584E-14	1.941E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142691	SLAPS Loadout	03/21/12	Gross Alpha/Beta	Gross Alpha	3.864E-15	9.727E-15	1.605E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.17E-14	1.757E-14	2.654E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142692	SLAPS Loadout	03/21/12	Gross Alpha/Beta	Gross Alpha	6.455E-15	8.344E-15	1.196E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.152E-14	1.37E-14	1.978E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142693	SLAPS Loadout	03/22/12	Gross Alpha/Beta	Gross Alpha	2.727E-15	7.977E-15	1.383E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.866E-14	2.304E-14	3.68E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142694	SLAPS Loadout	03/22/12	Gross Alpha/Beta	Gross Alpha	-4.85E-16	4.269E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.999E-14	1.626E-14	2.487E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142695	SLAPS Loadout	03/22/12	Gross Alpha/Beta	Gross Alpha	3.008E-15	5.873E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.113E-14	1.544E-14	2.487E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142696	SLAPS Loadout	03/22/12	Gross Alpha/Beta	Gross Alpha	-4.85E-16	4.269E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.663E-14	1.686E-14	2.487E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142697	SLAPS Loadout	03/22/12	Gross Alpha/Beta	Gross Alpha	9.91E-16	7.097E-15	1.364E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.194E-14	2.211E-14	3.63E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142698	SLAPS Loadout	03/26/12	Gross Alpha/Beta	Gross Alpha	6.269E-15	6.871E-15	9.015E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.632E-14	1.798E-14	2.399E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142699	SLAPS Loadout	03/26/12	Gross Alpha/Beta	Gross Alpha	4.023E-15	6.093E-15	9.015E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.284E-14	1.6E-14	2.399E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142700	SLAPS Loadout	03/26/12	Gross Alpha/Beta	Gross Alpha	5.216E-15	6.582E-15	9.137E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.046E-14	1.77E-14	2.431E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142701	SLAPS Loadout	03/26/12	Gross Alpha/Beta	Gross Alpha	3.918E-15	5.934E-15	8.78E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.472E-14	1.666E-14	2.336E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142702	SLAPS Loadout	03/26/12	Gross Alpha/Beta	Gross Alpha	6.55E-16	4.689E-15	9.015E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.067E-14	1.669E-14	2.399E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142703	SLAPS Loadout	03/27/12	Gross Alpha/Beta	Gross Alpha	2.85E-15	5.564E-15	8.857E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.083E-14	1.645E-14	2.356E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142704	SLAPS Loadout	03/27/12	Gross Alpha/Beta	Gross Alpha	6.55E-16	4.689E-15	9.015E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.618E-15	1.419E-14	2.399E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142705	SLAPS Loadout	03/27/12	Gross Alpha/Beta	Gross Alpha	1.844E-15	5.392E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.113E-14	1.544E-14	2.487E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142706	SLAPS Loadout	03/27/12	Gross Alpha/Beta	Gross Alpha	6.79E-16	4.863E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.482E-14	1.579E-14	2.487E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142707	SLAPS Loadout	03/27/12	Gross Alpha/Beta	Gross Alpha	6.501E-15	7.125E-15	9.349E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.368E-14	1.659E-14	2.487E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142708	SLAPS Loadout	03/28/12	Gross Alpha/Beta	Gross Alpha	5.216E-15	6.582E-15	9.137E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.912E-14	1.839E-14	2.431E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142709	SLAPS Loadout	03/28/12	Gross Alpha/Beta	Gross Alpha	2.927E-15	5.715E-15	9.096E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.315E-14	1.785E-14	2.42E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142710	SLAPS Loadout	03/28/12	Gross Alpha/Beta	Gross Alpha	1.794E-15	5.246E-15	9.096E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.951E-14	1.671E-14	2.42E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142711	SLAPS Loadout	03/28/12	Gross Alpha/Beta	Gross Alpha	2.927E-15	5.715E-15	9.096E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.299E-14	1.522E-14	2.42E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142712	SLAPS Loadout	03/28/12	Gross Alpha/Beta	Gross Alpha	8.292E-15	7.372E-15	8.78E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.68E-14	1.683E-14	2.336E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142713	SLAPS Loadout	03/29/12	Gross Alpha/Beta	Gross Alpha	1.746E-15	5.108E-15	8.857E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.733E-14	1.615E-14	2.356E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142714	SLAPS Loadout	03/29/12	Gross Alpha/Beta	Gross Alpha	3.065E-15	5.984E-15	9.525E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.691E-14	1.801E-14	2.534E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142715	SLAPS Loadout	03/29/12	Gross Alpha/Beta	Gross Alpha	3.094E-15	6.041E-15	9.616E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.423E-14	1.793E-14	2.558E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142716	SLAPS Loadout	03/29/12	Gross Alpha/Beta	Gross Alpha	6.92E-16	4.955E-15	9.525E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.262E-14	1.677E-14	2.534E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142717	SLAPS Loadout	03/29/12	Gross Alpha/Beta	Gross Alpha	7.34E-16	5.252E-15	1.01E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2E-14	1.742E-14	2.686E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142718	SLAPS Loadout	04/02/12	Gross Alpha/Beta	Gross Alpha	9.513E-15	8.193E-15	9.894E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.424E-14	1.631E-14	1.814E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142719	SLAPS Loadout	04/02/12	Gross Alpha/Beta	Gross Alpha	1.326E-15	5.363E-15	9.894E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.674E-14	1.56E-14	1.814E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142720	SLAPS Loadout	04/02/12	Gross Alpha/Beta	Gross Alpha	6.004E-15	7.118E-15	9.894E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.149E-14	1.509E-14	1.814E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142721	SLAPS Loadout	04/02/12	Gross Alpha/Beta	Gross Alpha	1.012E-14	8.073E-15	9.374E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	3.836E-14	1.512E-14	1.719E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142722	SLAPS Loadout	04/02/12	Gross Alpha/Beta	Gross Alpha	6.622E-15	6.917E-15	9.133E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.014E-14	1.499E-14	1.675E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142723	SLAPS Loadout	04/03/12	Gross Alpha/Beta	Gross Alpha	1.48E-16	4.572E-15	9.374E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.1E-16	1.101E-14	1.719E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142724	SLAPS Loadout	04/03/12	Gross Alpha/Beta	Gross Alpha	6.685E-15	7.926E-15	1.102E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.17E-14	1.541E-14	2.02E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142725	SLAPS Loadout	04/03/12	Gross Alpha/Beta	Gross Alpha	6.755E-15	8.008E-15	1.113E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.796E-14	1.722E-14	2.041E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142726	SLAPS Loadout	04/03/12	Gross Alpha/Beta	Gross Alpha	3.881E-15	6.673E-15	1.048E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.414E-14	1.605E-14	1.921E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142727	SLAPS Loadout	04/03/12	Gross Alpha/Beta	Gross Alpha	2.778E-15	6.515E-15	1.102E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.256E-14	1.654E-14	2.02E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142728	SLAPS Loadout	04/04/12	Gross Alpha/Beta	Gross Alpha	5.895E-15	6.989E-15	9.714E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.092E-14	1.481E-14	1.781E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142729	SLAPS Loadout	04/04/12	Gross Alpha/Beta	Gross Alpha	9.34E-15	8.044E-15	9.714E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.945E-14	1.466E-14	1.781E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142730	SLAPS Loadout	04/04/12	Gross Alpha/Beta	Gross Alpha	8.192E-15	7.708E-15	9.714E-15	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.797E-14	1.451E-14	1.781E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142731	SLAPS Loadout	04/04/12	Gross Alpha/Beta	Gross Alpha	1.049E-14	8.366E-15	9.714E-15	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	4.122E-14	1.581E-14	1.781E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142732	SLAPS Loadout	04/04/12	Gross Alpha/Beta	Gross Alpha	5.452E-15	7.445E-15	1.094E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.753E-14	1.35E-14	1.799E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142733	SLAPS Loadout	04/05/12	Gross Alpha/Beta	Gross Alpha	-2.02E-16	5.895E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.797E-14	1.322E-14	1.937E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142734	SLAPS Loadout	04/05/12	Gross Alpha/Beta	Gross Alpha	-1.352E-15	5.125E-15	1.124E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.938E-14	1.288E-14	1.848E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142735	SLAPS Loadout	04/05/12	Gross Alpha/Beta	Gross Alpha	-1.417E-15	5.372E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.887E-14	1.445E-14	1.937E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142736	SLAPS Loadout	04/05/12	Gross Alpha/Beta	Gross Alpha	-5.061E-15	3.341E-15	1.178E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.401E-15	1.124E-14	1.937E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142737	SLAPS Loadout	04/05/12	Gross Alpha/Beta	Gross Alpha	-4.966E-15	3.278E-15	1.156E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.611E-14	1.279E-14	1.9E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142738	SLAPS Loadout	04/09/12	Gross Alpha/Beta	Gross Alpha	-8.87E-16	3.346E-15	8.274E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.354E-14	1.487E-14	2.233E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142739	SLAPS Loadout	04/09/12	Gross Alpha/Beta	Gross Alpha	-8.87E-16	3.346E-15	8.274E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.906E-14	1.532E-14	2.233E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142740	SLAPS Loadout	04/09/12	Gross Alpha/Beta	Gross Alpha	-1.785E-15	2.629E-15	7.968E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.127E-14	1.417E-14	2.15E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142741	SLAPS Loadout	04/09/12	Gross Alpha/Beta	Gross Alpha	1.261E-15	5.202E-15	9.96E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.778E-14	1.802E-14	2.688E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142742	SLAPS Loadout	04/09/12	Gross Alpha/Beta	Gross Alpha	1.442E-15	5.945E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.394E-14	2.245E-14	3.072E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142743	SLAPS Loadout	04/10/12	Gross Alpha/Beta	Gross Alpha	-1.876E-15	2.762E-15	8.371E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.928E-14	1.55E-14	2.259E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142744	SLAPS Loadout	04/10/12	Gross Alpha/Beta	Gross Alpha	1.09E-15	4.495E-15	8.605E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.408E-14	1.546E-14	2.322E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142745	SLAPS Loadout	04/10/12	Gross Alpha/Beta	Gross Alpha	1.261E-15	5.202E-15	9.96E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.966E-15	1.702E-14	2.688E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142746	SLAPS Loadout	04/10/12	Gross Alpha/Beta	Gross Alpha	-1.067E-15	4.027E-15	9.96E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.482E-14	1.777E-14	2.688E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142747	SLAPS Loadout	04/10/12	Gross Alpha/Beta	Gross Alpha	9.8E-17	4.695E-15	1.005E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.002E-15	1.744E-14	2.713E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142748	SLAPS Loadout	04/11/12	Gross Alpha/Beta	Gross Alpha	-1.967E-15	2.897E-15	8.781E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.112E-14	1.551E-14	2.37E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142749	SLAPS Loadout	04/11/12	Gross Alpha/Beta	Gross Alpha	3.231E-15	5.541E-15	8.964E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.377E-15	1.515E-14	2.419E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142750	SLAPS Loadout	04/11/12	Gross Alpha/Beta	Gross Alpha	-1.077E-15	4.065E-15	1.005E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.496E-14	1.794E-14	2.713E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142751	SLAPS Loadout	04/11/12	Gross Alpha/Beta	Gross Alpha	-1.077E-15	4.065E-15	1.005E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.002E-15	1.744E-14	2.713E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142752	SLAPS Loadout	04/11/12	Gross Alpha/Beta	Gross Alpha	-1.014E-15	4.221E-15	9.894E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.724E-14	1.359E-14	1.814E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142753	SLAPS Loadout	04/12/12	Gross Alpha/Beta	Gross Alpha	1.101E-15	4.455E-15	8.22E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.557E-14	1.143E-14	1.507E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142754	SLAPS Loadout	04/12/12	Gross Alpha/Beta	Gross Alpha	1.6E-16	4.94E-15	1.013E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-2.303E-15	1.15E-14	1.857E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142755	SLAPS Loadout	04/12/12	Gross Alpha/Beta	Gross Alpha	7.379E-15	7.708E-15	1.018E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.254E-15	1.301E-14	1.866E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142756	SLAPS Loadout	04/12/12	Gross Alpha/Beta	Gross Alpha	3.77E-15	6.482E-15	1.018E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.234E-14	1.337E-14	1.866E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142757	SLAPS Loadout	04/12/12	Gross Alpha/Beta	Gross Alpha	2.265E-15	5.31E-15	8.98E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.926E-14	1.376E-14	1.646E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142758	SLAPS Loadout	04/16/12	Gross Alpha/Beta	Gross Alpha	-5.05E-16	5.057E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.366E-14	1.324E-14	1.541E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142759	SLAPS Loadout	04/16/12	Gross Alpha/Beta	Gross Alpha	-5.05E-16	5.057E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.884E-15	1.246E-14	1.541E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142760	SLAPS Loadout	04/16/12	Gross Alpha/Beta	Gross Alpha	3.008E-15	7.322E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.163E-14	1.53E-14	1.835E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142761	SLAPS Loadout	04/16/12	Gross Alpha/Beta	Gross Alpha	-6.02E-16	6.02E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.776E-15	1.491E-14	1.835E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142762	SLAPS Loadout	04/16/12	Gross Alpha/Beta	Gross Alpha	-3.008E-15	4.966E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.086E-14	1.523E-14	1.835E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142763	SLAPS Loadout	04/17/12	Gross Alpha/Beta	Gross Alpha	-4.86E-16	4.862E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.185E-14	1.356E-14	1.482E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142764	SLAPS Loadout	04/17/12	Gross Alpha/Beta	Gross Alpha	-4.86E-16	4.862E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.31E-14	1.368E-14	1.482E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142765	SLAPS Loadout	04/17/12	Gross Alpha/Beta	Gross Alpha	5.74E-16	6.188E-15	1.145E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.699E-14	1.519E-14	1.751E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142766	SLAPS Loadout	04/17/12	Gross Alpha/Beta	Gross Alpha	5.168E-15	7.708E-15	1.145E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.509E-14	1.596E-14	1.751E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142767	SLAPS Loadout	04/17/12	Gross Alpha/Beta	Gross Alpha	-1.723E-15	5.268E-15	1.145E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.184E-14	1.468E-14	1.751E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142768	SLAPS Loadout	04/18/12	Gross Alpha/Beta	Gross Alpha	4.373E-15	6.522E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.248E-14	1.362E-14	1.482E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142769	SLAPS Loadout	04/18/12	Gross Alpha/Beta	Gross Alpha	-4.86E-16	4.862E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.933E-14	1.423E-14	1.482E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142770	SLAPS Loadout	04/18/12	Gross Alpha/Beta	Gross Alpha	1.805E-15	6.915E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.857E-14	1.599E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142771	SLAPS Loadout	04/18/12	Gross Alpha/Beta	Gross Alpha	6.02E-16	6.483E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.86E-14	1.693E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142772	SLAPS Loadout	04/18/12	Gross Alpha/Beta	Gross Alpha	5.74E-16	6.188E-15	1.145E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.92E-14	1.54E-14	1.751E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142773	SLAPS Loadout	04/19/12	Gross Alpha/Beta	Gross Alpha	-1.458E-15	4.457E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.251E-14	1.267E-14	1.482E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142774	SLAPS Loadout	04/19/12	Gross Alpha/Beta	Gross Alpha	6.316E-15	7.078E-15	9.688E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.185E-14	1.356E-14	1.482E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142775	SLAPS Loadout	04/19/12	Gross Alpha/Beta	Gross Alpha	-1.805E-15	5.518E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.783E-14	1.686E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142776	SLAPS Loadout	04/19/12	Gross Alpha/Beta	Gross Alpha	6.02E-16	6.483E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.014E-14	1.707E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142777	SLAPS Loadout	04/19/12	Gross Alpha/Beta	Gross Alpha	5.414E-15	8.075E-15	1.2E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.4E-14	1.742E-14	1.835E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142778	SLAPS Loadout	04/23/12	Gross Alpha/Beta	Gross Alpha	5.314E-15	8.346E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.613E-14	1.265E-14	1.86E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142779	SLAPS Loadout	04/23/12	Gross Alpha/Beta	Gross Alpha	2.908E-15	7.62E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.307E-14	1.348E-14	1.86E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142780	SLAPS Loadout	04/23/12	Gross Alpha/Beta	Gross Alpha	5.314E-15	8.346E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.999E-14	1.312E-14	1.86E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142781	SLAPS Loadout	04/23/12	Gross Alpha/Beta	Gross Alpha	2.908E-15	7.62E-15	1.105E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.307E-14	1.348E-14	1.86E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142782	SLAPS Loadout	04/23/12	Gross Alpha/Beta	Gross Alpha	1.013E-14	9.636E-15	1.105E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.23E-14	1.339E-14	1.86E-14	µCi/mL	J	T04	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142783	SLAPS Loadout	04/24/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	8.226E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.661E-14	1.303E-14	1.914E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142784	SLAPS Loadout	04/24/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	8.226E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.757E-14	1.638E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142785	SLAPS Loadout	04/24/12	Gross Alpha/Beta	Gross Alpha	1.29E-14	1.052E-14	1.138E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	2.772E-14	1.432E-14	1.914E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142786	SLAPS Loadout	04/24/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	8.226E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.422E-14	1.273E-14	1.914E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142787	SLAPS Loadout	04/24/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	8.226E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.201E-14	1.583E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142788	SLAPS Loadout	04/25/12	Gross Alpha/Beta	Gross Alpha	1.755E-15	7.443E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.963E-14	1.559E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142789	SLAPS Loadout	04/25/12	Gross Alpha/Beta	Gross Alpha	1.786E-14	1.163E-14	1.138E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	4.28E-14	1.591E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142790	SLAPS Loadout	04/25/12	Gross Alpha/Beta	Gross Alpha	1.755E-15	7.443E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.184E-14	1.243E-14	1.914E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142791	SLAPS Loadout	04/25/12	Gross Alpha/Beta	Gross Alpha	5.47E-15	8.591E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.422E-14	1.273E-14	1.914E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142792	SLAPS Loadout	04/25/12	Gross Alpha/Beta	Gross Alpha	1.042E-14	9.92E-15	1.138E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	4.598E-14	1.623E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142793	SLAPS Loadout	04/26/12	Gross Alpha/Beta	Gross Alpha	-1.942E-15	6.022E-15	1.127E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.037E-14	1.337E-14	1.896E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142794	SLAPS Loadout	04/26/12	Gross Alpha/Beta	Gross Alpha	1.032E-14	9.823E-15	1.127E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	3.217E-14	1.47E-14	1.896E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142795	SLAPS Loadout	04/26/12	Gross Alpha/Beta	Gross Alpha	-1.942E-15	6.022E-15	1.127E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.644E-14	1.29E-14	1.896E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142796	SLAPS Loadout	04/26/12	Gross Alpha/Beta	Gross Alpha	2.993E-15	7.844E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.312E-14	1.692E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142797	SLAPS Loadout	04/26/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	8.226E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	4.677E-14	1.631E-14	1.914E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142798	SLAPS Loadout	04/30/12	Gross Alpha/Beta	Gross Alpha	1.497E-15	4.269E-15	8.666E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.043E-14	1.828E-14	2.765E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142799	SLAPS Loadout	04/30/12	Gross Alpha/Beta	Gross Alpha	5.09E-15	5.953E-15	8.666E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.933E-15	1.649E-14	2.765E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142800	SLAPS Loadout	04/30/12	Gross Alpha/Beta	Gross Alpha	2.98E-16	3.516E-15	8.625E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	8.375E-15	1.627E-14	2.752E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142801	SLAPS Loadout	04/30/12	Gross Alpha/Beta	Gross Alpha	4.225E-15	4.941E-15	7.193E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.329E-14	1.414E-14	2.295E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142802	SLAPS Loadout	04/30/12	Gross Alpha/Beta	Gross Alpha	1.233E-15	3.515E-15	7.136E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.381E-14	1.409E-14	2.277E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142803	SLAPS Loadout	05/01/12	Gross Alpha/Beta	Gross Alpha	6.99E-16	8.244E-15	2.022E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-5.167E-15	3.576E-14	6.451E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142804	SLAPS Loadout	05/01/12	Gross Alpha/Beta	Gross Alpha	6.99E-16	8.244E-15	2.022E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-1.048E-14	3.523E-14	6.451E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142805	SLAPS Loadout	05/01/12	Gross Alpha/Beta	Gross Alpha	3.493E-15	9.96E-15	2.022E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-1.624E-15	3.611E-14	6.451E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142806	SLAPS Loadout	05/01/12	Gross Alpha/Beta	Gross Alpha	6.99E-16	8.244E-15	2.022E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.255E-14	3.748E-14	6.451E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142807	SLAPS Loadout	05/01/12	Gross Alpha/Beta	Gross Alpha	6.287E-15	1.142E-14	2.022E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.609E-14	3.781E-14	6.451E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142808	SLAPS Loadout	05/02/12	Gross Alpha/Beta	Gross Alpha	1.41E-15	4.02E-15	8.161E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.15E-14	1.572E-14	2.604E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142809	SLAPS Loadout	05/02/12	Gross Alpha/Beta	Gross Alpha	2.572E-15	4.672E-15	8.272E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.745E-14	1.646E-14	2.639E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142810	SLAPS Loadout	05/02/12	Gross Alpha/Beta	Gross Alpha	2.572E-15	4.672E-15	8.272E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.311E-14	1.607E-14	2.639E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142811	SLAPS Loadout	05/02/12	Gross Alpha/Beta	Gross Alpha	2.572E-15	4.672E-15	8.272E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.702E-14	1.81E-14	2.639E-14	µCi/mL	=		SLAPS General Air Monitoring
SLA142812	SLAPS Loadout	05/02/12	Gross Alpha/Beta	Gross Alpha	4.79E-16	6.986E-15	1.153E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.122E-14	1.615E-14	1.863E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142813	SLAPS Loadout	05/03/12	Gross Alpha/Beta	Gross Alpha	3.79E-15	4.377E-15	3.418E-15	µCi/mL	J	F01, T02	SLAPS General Air Monitoring
				Gross Beta	4.616E-14	1.225E-14	2.191E-15	µCi/mL	=		SLAPS General Air Monitoring
SLA142814	SLAPS Loadout	05/03/12	Gross Alpha/Beta	Gross Alpha	6.316E-15	5.651E-15	3.418E-15	µCi/mL	J	F01, T04	SLAPS General Air Monitoring
				Gross Beta	4.454E-14	1.203E-14	2.191E-15	µCi/mL	=		SLAPS General Air Monitoring
SLA142815	SLAPS Loadout	05/03/12	Gross Alpha/Beta	Gross Alpha	1.179E-14	8.917E-15	4.558E-15	µCi/mL	J	F01, T04	SLAPS General Air Monitoring
				Gross Beta	5.29E-14	1.514E-14	2.922E-15	µCi/mL	=		SLAPS General Air Monitoring
SLA142816	SLAPS Loadout	05/03/12	Gross Alpha/Beta	Gross Alpha	3.281E-15	4.641E-15	4.439E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	5.468E-14	1.519E-14	2.846E-15	µCi/mL	=		SLAPS General Air Monitoring
SLA142817	SLAPS Loadout	05/03/12	Gross Alpha/Beta	Gross Alpha	6.579E-15	5.887E-15	3.561E-15	µCi/mL	J	F01, T04	SLAPS General Air Monitoring
				Gross Beta	5.145E-14	1.32E-14	2.282E-15	µCi/mL	=		SLAPS General Air Monitoring
SLA142818	SLAPS Loadout	05/07/12	Gross Alpha/Beta	Gross Alpha	1.497E-15	4.269E-15	8.666E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.1E-15	1.584E-14	2.765E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142819	SLAPS Loadout	05/07/12	Gross Alpha/Beta	Gross Alpha	-2.136E-15	1.025E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	6.256E-15	1.645E-14	2.819E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142820	SLAPS Loadout	05/07/12	Gross Alpha/Beta	Gross Alpha	3.968E-15	5.555E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.386E-15	1.608E-14	2.819E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142821	SLAPS Loadout	05/07/12	Gross Alpha/Beta	Gross Alpha	3.05E-16	3.602E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.554E-14	1.73E-14	2.819E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142822	SLAPS Loadout	05/07/12	Gross Alpha/Beta	Gross Alpha	3.05E-16	3.602E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.18E-14	1.87E-14	2.819E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142823	SLAPS Loadout	05/08/12	Gross Alpha/Beta	Gross Alpha	3.02E-16	3.567E-15	8.749E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.766E-14	1.82E-14	2.791E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142824	SLAPS Loadout	05/08/12	Gross Alpha/Beta	Gross Alpha	3.02E-16	3.567E-15	8.749E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	-3.002E-15	1.54E-14	2.791E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142825	SLAPS Loadout	05/08/12	Gross Alpha/Beta	Gross Alpha	1.541E-15	4.394E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.491E-14	1.74E-14	2.846E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142826	SLAPS Loadout	05/08/12	Gross Alpha/Beta	Gross Alpha	-9.25E-16	2.674E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.836E-14	1.939E-14	2.846E-14	µCi/mL	J	T04	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142827	SLAPS Loadout	05/08/12	Gross Alpha/Beta	Gross Alpha	2.774E-15	5.039E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.648E-14	1.754E-14	2.846E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142828	SLAPS Loadout	05/09/12	Gross Alpha/Beta	Gross Alpha	4.007E-15	5.61E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.648E-14	1.754E-14	2.846E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142829	SLAPS Loadout	05/09/12	Gross Alpha/Beta	Gross Alpha	3.08E-16	3.637E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.444E-15	1.69E-14	2.846E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142830	SLAPS Loadout	05/09/12	Gross Alpha/Beta	Gross Alpha	2.774E-15	5.039E-15	8.921E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	9.444E-15	1.69E-14	2.846E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142831	SLAPS Loadout	05/09/12	Gross Alpha/Beta	Gross Alpha	-9.16E-16	2.648E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.941E-14	1.764E-14	2.819E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142832	SLAPS Loadout	05/09/12	Gross Alpha/Beta	Gross Alpha	1.308E-14	9.399E-15	1.093E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
				Gross Beta	2.186E-14	1.455E-14	1.885E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142833	SLAPS Loadout	05/10/12	Gross Alpha/Beta	Gross Alpha	-4.05E-16	4.652E-15	1.082E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.308E-14	1.345E-14	1.867E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142834	SLAPS Loadout	05/10/12	Gross Alpha/Beta	Gross Alpha	4.454E-15	6.727E-15	1.082E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.464E-14	1.363E-14	1.867E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142835	SLAPS Loadout	05/10/12	Gross Alpha/Beta	Gross Alpha	2.005E-15	5.728E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.761E-14	1.493E-14	1.849E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142836	SLAPS Loadout	05/10/12	Gross Alpha/Beta	Gross Alpha	5.723E-15	7.223E-15	1.093E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.792E-14	1.412E-14	1.885E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142837	SLAPS Loadout	05/10/12	Gross Alpha/Beta	Gross Alpha	6.883E-15	7.555E-15	1.082E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.32E-14	1.458E-14	1.867E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142838	SLAPS Loadout	05/14/12	Gross Alpha/Beta	Gross Alpha	9.553E-15	8.026E-15	1.006E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
				Gross Beta	2.943E-14	1.629E-14	1.714E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142839	SLAPS Loadout	05/14/12	Gross Alpha/Beta	Gross Alpha	7.19E-16	5.507E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.284E-14	1.621E-14	1.898E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142840	SLAPS Loadout	05/14/12	Gross Alpha/Beta	Gross Alpha	1.923E-15	5.946E-15	1.098E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.888E-14	1.657E-14	1.87E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142841	SLAPS Loadout	05/14/12	Gross Alpha/Beta	Gross Alpha	1.961E-15	6.063E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.719E-14	1.763E-14	1.907E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142842	SLAPS Loadout	05/14/12	Gross Alpha/Beta	Gross Alpha	5.24E-15	6.857E-15	1.033E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.264E-14	1.51E-14	1.76E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142843	SLAPS Loadout	05/15/12	Gross Alpha/Beta	Gross Alpha	5.676E-15	7.428E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.513E-14	1.833E-14	1.907E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142844	SLAPS Loadout	05/15/12	Gross Alpha/Beta	Gross Alpha	6.915E-15	7.831E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.116E-14	1.798E-14	1.907E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142845	SLAPS Loadout	05/15/12	Gross Alpha/Beta	Gross Alpha	3.199E-15	6.55E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.719E-14	1.763E-14	1.907E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142846	SLAPS Loadout	05/15/12	Gross Alpha/Beta	Gross Alpha	1.923E-15	5.946E-15	1.098E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.589E-14	1.722E-14	1.87E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142847	SLAPS Loadout	05/15/12	Gross Alpha/Beta	Gross Alpha	4.353E-15	6.868E-15	1.098E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.212E-14	1.777E-14	1.87E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142848	SLAPS Loadout	05/16/12	Gross Alpha/Beta	Gross Alpha	7.02E-16	5.375E-15	1.087E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.333E-14	1.684E-14	1.853E-14	µCi/mL	J	T04	SLAPS General Air Monitoring

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA142849	SLAPS Loadout	05/16/12	Gross Alpha/Beta	Gross Alpha	7.92E-15	7.979E-15	1.087E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.179E-14	1.67E-14	1.853E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142850	SLAPS Loadout	05/16/12	Gross Alpha/Beta	Gross Alpha	1.961E-15	6.063E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	7.343E-15	1.573E-14	1.907E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142851	SLAPS Loadout	05/16/12	Gross Alpha/Beta	Gross Alpha	5.676E-15	7.428E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	1.608E-14	1.659E-14	1.907E-14	µCi/mL	UJ	T06	SLAPS General Air Monitoring
SLA142852	SLAPS Loadout	05/16/12	Gross Alpha/Beta	Gross Alpha	2.217E-15	5.034E-15	9.366E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.357E-14	2.306E-14	2.617E-14	µCi/mL	U	T04, T05	SLAPS General Air Monitoring
SLA142853	SLAPS Loadout	05/17/12	Gross Alpha/Beta	Gross Alpha	3.493E-15	5.694E-15	9.55E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	3.185E-14	2.403E-14	2.668E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA142854	SLAPS Loadout	05/17/12	Gross Alpha/Beta	Gross Alpha	3.426E-15	5.585E-15	9.366E-15	µCi/mL	UJ	T06	SLAPS General Air Monitoring
				Gross Beta	2.817E-14	2.336E-14	2.617E-14	µCi/mL	J	T04	SLAPS General Air Monitoring
SLA143726	SLAPS Loadout	05/17/12	Gross Alpha/Beta	Gross Alpha	2.26E-15	5.133E-15	9.55E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.013E-14	2.325E-14	2.668E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143727	SLAPS Loadout	05/17/12	Gross Alpha/Beta	Gross Alpha	4.591E-15	6.028E-15	9.277E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.259E-14	2.279E-14	2.592E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143728	SLAPS Loadout	05/17/12	Gross Alpha/Beta	Gross Alpha	4.726E-15	6.205E-15	9.55E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.95E-14	2.387E-14	2.668E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143729	SLAPS Loadout	05/21/12	Gross Alpha/Beta	Gross Alpha	8.669E-15	8.649E-15	1.183E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.01E-14	1.427E-14	1.914E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143730	SLAPS Loadout	05/21/12	Gross Alpha/Beta	Gross Alpha	7.288E-15	8.127E-15	1.161E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.706E-14	1.252E-14	1.878E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143731	SLAPS Loadout	05/21/12	Gross Alpha/Beta	Gross Alpha	1.238E-15	6.16E-15	1.183E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.454E-14	1.363E-14	1.914E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143732	SLAPS Loadout	05/21/12	Gross Alpha/Beta	Gross Alpha	1.181E-15	5.872E-15	1.128E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.507E-14	1.198E-14	1.825E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143733	SLAPS Loadout	05/21/12	Gross Alpha/Beta	Gross Alpha	1.238E-15	6.16E-15	1.183E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.581E-14	1.257E-14	1.914E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143734	SLAPS Loadout	05/22/12	Gross Alpha/Beta	Gross Alpha	5.64E-15	7.201E-15	1.078E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.006E-14	1.089E-14	1.743E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143735	SLAPS Loadout	05/22/12	Gross Alpha/Beta	Gross Alpha	2.276E-15	6.101E-15	1.087E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.453E-14	1.155E-14	1.759E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143736	SLAPS Loadout	05/22/12	Gross Alpha/Beta	Gross Alpha	0	5.327E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.718E-14	1.215E-14	1.808E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143737	SLAPS Loadout	05/22/12	Gross Alpha/Beta	Gross Alpha	4.679E-15	7.091E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.343E-14	1.168E-14	1.808E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143738	SLAPS Loadout	05/22/12	Gross Alpha/Beta	Gross Alpha	2.339E-15	6.271E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.436E-15	1.046E-14	1.808E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143739	SLAPS Loadout	05/23/12	Gross Alpha/Beta	Gross Alpha	3.324E-15	6.341E-15	1.059E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.175E-15	1.06E-14	1.713E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143740	SLAPS Loadout	05/23/12	Gross Alpha/Beta	Gross Alpha	4.594E-15	6.962E-15	1.097E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.613E-14	1.184E-14	1.775E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143741	SLAPS Loadout	05/23/12	Gross Alpha/Beta	Gross Alpha	1.17E-15	5.818E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.268E-14	1.158E-14	1.808E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143742	SLAPS Loadout	05/23/12	Gross Alpha/Beta	Gross Alpha	1.17E-15	5.818E-15	1.118E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.568E-14	1.197E-14	1.808E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143743	SLAPS Loadout	05/23/12	Gross Alpha/Beta	Gross Alpha	-2.717E-15	2.005E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.121E-15	1.984E-14	2.682E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143744	SLAPS Loadout	05/24/12	Gross Alpha/Beta	Gross Alpha	8.34E-16	4.84E-15	9.931E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.808E-15	2.15E-14	2.882E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143745	SLAPS Loadout	05/24/12	Gross Alpha/Beta	Gross Alpha	3.256E-15	5.85E-15	9.689E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.284E-14	2.143E-14	2.812E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143746	SLAPS Loadout	05/24/12	Gross Alpha/Beta	Gross Alpha	2.075E-15	5.422E-15	9.881E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.564E-15	2.145E-14	2.867E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143747	SLAPS Loadout	05/24/12	Gross Alpha/Beta	Gross Alpha	-4.03E-16	4.003E-15	9.596E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.579E-15	2.077E-14	2.785E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143748	SLAPS Loadout	05/24/12	Gross Alpha/Beta	Gross Alpha	-1.62E-15	3.206E-15	9.643E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.664E-14	2.23E-14	2.798E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143749	SLAPS Loadout	05/29/12	Gross Alpha/Beta	Gross Alpha	5.33E-15	7.549E-15	1.154E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.62E-14	2.558E-14	3.348E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143750	SLAPS Loadout	05/29/12	Gross Alpha/Beta	Gross Alpha	-3.94E-16	3.909E-15	9.371E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.765E-14	2.11E-14	2.719E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143751	SLAPS Loadout	05/29/12	Gross Alpha/Beta	Gross Alpha	7.76E-16	4.504E-15	9.241E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.288E-15	2.022E-14	2.682E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143752	SLAPS Loadout	05/29/12	Gross Alpha/Beta	Gross Alpha	3.858E-15	5.464E-15	8.352E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.059E-15	1.803E-14	2.424E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143753	SLAPS Loadout	05/29/12	Gross Alpha/Beta	Gross Alpha	-1.567E-15	3.101E-15	9.327E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.087E-14	2.052E-14	2.707E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143754	SLAPS Loadout	05/30/12	Gross Alpha/Beta	Gross Alpha	-1.702E-15	3.369E-15	1.013E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-4.384E-15	2.108E-14	2.94E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143755	SLAPS Loadout	05/30/12	Gross Alpha/Beta	Gross Alpha	-1.694E-15	3.352E-15	1.008E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.301E-15	2.17E-14	2.925E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143756	SLAPS Loadout	05/30/12	Gross Alpha/Beta	Gross Alpha	4.705E-15	6.663E-15	1.018E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.105E-14	2.234E-14	2.955E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143757	SLAPS Loadout	05/30/12	Gross Alpha/Beta	Gross Alpha	2.045E-15	5.342E-15	9.737E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.231E-15	2.119E-14	2.826E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143758	SLAPS Loadout	05/30/12	Gross Alpha/Beta	Gross Alpha	8.1E-16	4.7E-15	9.643E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.49E-16	2.041E-14	2.798E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143759	SLAPS Loadout	05/31/12	Gross Alpha/Beta	Gross Alpha	5.239E-15	7.42E-15	1.134E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.34E-15	2.415E-14	3.291E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143760	SLAPS Loadout	05/31/12	Gross Alpha/Beta	Gross Alpha	9.58E-16	5.559E-15	1.141E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.442E-15	2.422E-14	3.31E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143761	SLAPS Loadout	06/04/12	Gross Alpha/Beta	Gross Alpha	4.12E-15	5.717E-15	8.326E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-2.441E-15	1.387E-14	2.524E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143762	SLAPS Loadout	06/04/12	Gross Alpha/Beta	Gross Alpha	7.344E-15	6.824E-15	8.326E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.596E-14	1.558E-14	2.524E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143763	SLAPS Loadout	06/04/12	Gross Alpha/Beta	Gross Alpha	8.77E-16	4.248E-15	8.151E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.096E-14	1.571E-14	2.472E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143764	SLAPS Loadout	06/04/12	Gross Alpha/Beta	Gross Alpha	1.97E-15	4.842E-15	8.326E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.345E-14	1.622E-14	2.524E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143765	SLAPS Loadout	06/04/12	Gross Alpha/Beta	Gross Alpha	1.921E-15	4.721E-15	8.117E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.584E-15	1.447E-14	2.461E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143766	SLAPS Loadout	06/05/12	Gross Alpha/Beta	Gross Alpha	2.283E-15	5.609E-15	9.644E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.48E-14	1.859E-14	2.924E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143767	SLAPS Loadout	06/05/12	Gross Alpha/Beta	Gross Alpha	3.153E-15	5.485E-15	8.62E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.232E-15	1.511E-14	2.614E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143768	SLAPS Loadout	06/05/12	Gross Alpha/Beta	Gross Alpha	4.285E-15	5.946E-15	8.659E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.659E-14	1.62E-14	2.625E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143769	SLAPS Loadout	06/05/12	Gross Alpha/Beta	Gross Alpha	8.756E-15	7.441E-15	8.659E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.421E-15	1.491E-14	2.625E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143770	SLAPS Loadout	06/05/12	Gross Alpha/Beta	Gross Alpha	2.049E-15	5.036E-15	8.659E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.73E-14	1.626E-14	2.625E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143771	SLAPS Loadout	06/06/12	Gross Alpha/Beta	Gross Alpha	9.344E-15	9.652E-15	1.241E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.292E-14	2.4E-14	3.762E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143772	SLAPS Loadout	06/06/12	Gross Alpha/Beta	Gross Alpha	3.689E-15	9.064E-15	1.559E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.201E-14	2.755E-14	4.725E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143773	SLAPS Loadout	06/06/12	Gross Alpha/Beta	Gross Alpha	9.571E-15	1.126E-14	1.534E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.311E-15	2.688E-14	4.651E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143774	SLAPS Loadout	06/06/12	Gross Alpha/Beta	Gross Alpha	4.52E-15	1.111E-14	1.91E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.253E-14	3.448E-14	5.791E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143775	SLAPS Loadout	06/06/12	Gross Alpha/Beta	Gross Alpha	2.717E-15	8.961E-15	1.603E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.57E-15	1.502E-14	2.617E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143776	SLAPS Loadout	06/07/12	Gross Alpha/Beta	Gross Alpha	-4.232E-15	4.06E-15	1.249E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.39E-16	1.135E-14	2.039E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143777	SLAPS Loadout	06/07/12	Gross Alpha/Beta	Gross Alpha	8.422E-15	8.955E-15	1.242E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.329E-14	1.302E-14	2.029E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143778	SLAPS Loadout	06/07/12	Gross Alpha/Beta	Gross Alpha	3.091E-15	6.78E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.368E-14	1.213E-14	1.861E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143779	SLAPS Loadout	06/07/12	Gross Alpha/Beta	Gross Alpha	-2.704E-15	4.371E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.591E-14	1.24E-14	1.861E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143780	SLAPS Loadout	06/07/12	Gross Alpha/Beta	Gross Alpha	3.091E-15	6.78E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.481E-15	1.148E-14	1.861E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143781	SLAPS Loadout	06/11/12	Gross Alpha/Beta	Gross Alpha	-5.848E-15	5.611E-15	1.726E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-5.155E-15	1.486E-14	2.817E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143782	SLAPS Loadout	06/11/12	Gross Alpha/Beta	Gross Alpha	-6.02E-16	8.507E-15	1.775E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.668E-14	1.832E-14	2.898E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143783	SLAPS Loadout	06/11/12	Gross Alpha/Beta	Gross Alpha	1.221E-15	9.375E-15	1.801E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.457E-14	1.828E-14	2.94E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143784	SLAPS Loadout	06/11/12	Gross Alpha/Beta	Gross Alpha	4.954E-15	1.087E-14	1.827E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.641E-15	1.761E-14	2.983E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143785	SLAPS Loadout	06/11/12	Gross Alpha/Beta	Gross Alpha	-2.477E-15	7.93E-15	1.827E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.069E-15	1.712E-14	2.983E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143786	SLAPS Loadout	06/12/12	Gross Alpha/Beta	Gross Alpha	6.449E-15	7.739E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.854E-14	1.253E-14	1.828E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143787	SLAPS Loadout	06/12/12	Gross Alpha/Beta	Gross Alpha	1.888E-15	6.229E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.291E-15	1.122E-14	1.819E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143788	SLAPS Loadout	06/12/12	Gross Alpha/Beta	Gross Alpha	-1.517E-15	4.858E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.489E-14	1.209E-14	1.828E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143789	SLAPS Loadout	06/12/12	Gross Alpha/Beta	Gross Alpha	7.49E-16	5.75E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.937E-15	1.121E-14	1.803E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143790	SLAPS Loadout	06/12/12	Gross Alpha/Beta	Gross Alpha	2.994E-15	6.569E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.618E-15	1.064E-14	1.803E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143791	SLAPS Loadout	06/13/12	Gross Alpha/Beta	Gross Alpha	7.73E-16	5.935E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.111E-14	1.301E-14	1.861E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143792	SLAPS Loadout	06/13/12	Gross Alpha/Beta	Gross Alpha	7.73E-16	5.935E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.51E-15	1.109E-14	1.861E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143793	SLAPS Loadout	06/13/12	Gross Alpha/Beta	Gross Alpha	-3.863E-15	3.707E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.224E-15	1.157E-14	1.861E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143794	SLAPS Loadout	06/13/12	Gross Alpha/Beta	Gross Alpha	-2.655E-15	4.292E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.125E-14	1.164E-14	1.828E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143795	SLAPS Loadout	06/13/12	Gross Alpha/Beta	Gross Alpha	7.59E-16	5.828E-15	1.119E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.41E-15	1.089E-14	1.828E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143796	SLAPS Loadout	06/14/12	Gross Alpha/Beta	Gross Alpha	4.23E-15	7.133E-15	1.135E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.767E-14	1.369E-14	1.853E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143797	SLAPS Loadout	06/14/12	Gross Alpha/Beta	Gross Alpha	5.408E-15	7.532E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.111E-14	1.301E-14	1.861E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143798	SLAPS Loadout	06/14/12	Gross Alpha/Beta	Gross Alpha	5.359E-15	7.463E-15	1.129E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.871E-14	1.264E-14	1.844E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143799	SLAPS Loadout	06/14/12	Gross Alpha/Beta	Gross Alpha	-3.63E-16	5.13E-15	1.07E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.37E-15	1.10E-14	1.75E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143800	SLAPS Loadout	06/14/12	Gross Alpha/Beta	Gross Alpha	6.42E-15	7.70E-15	1.11E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.23E-14	1.40E-14	1.82E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143801	SLAPS Loadout	06/18/12	Gross Alpha/Beta	Gross Alpha	5.45E-15	6.41E-15	8.74E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.77E-14	1.72E-14	2.51E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143802	SLAPS Loadout	06/18/12	Gross Alpha/Beta	Gross Alpha	5.71E-15	6.71E-15	9.15E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.39E-14	1.93E-14	2.63E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143803	SLAPS Loadout	06/18/12	Gross Alpha/Beta	Gross Alpha	4.55E-15	6.31E-15	9.19E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.43E-14	1.86E-14	2.64E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143804	SLAPS Loadout	06/18/12	Gross Alpha/Beta	Gross Alpha	2.185E-15	5.37E-15	9.233E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.037E-15	1.609E-14	2.65E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143805	SLAPS Loadout	06/18/12	Gross Alpha/Beta	Gross Alpha	2.175E-15	5.345E-15	9.19E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.705E-14	1.711E-14	2.638E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143806	SLAPS Loadout	06/19/12	Gross Alpha/Beta	Gross Alpha	4.29E-15	5.95E-15	8.66E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.04E-14	1.56E-14	2.49E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143807	SLAPS Loadout	06/19/12	Gross Alpha/Beta	Gross Alpha	4.42E-15	6.14E-15	8.94E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.68E-14	1.75E-14	2.57E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143808	SLAPS Loadout	06/19/12	Gross Alpha/Beta	Gross Alpha	3.21E-15	5.58E-15	8.78E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-5.99E-15	1.42E-14	2.52E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143809	SLAPS Loadout	06/19/12	Gross Alpha/Beta	Gross Alpha	9.48E-16	4.59E-15	8.82E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.64E-14	1.64E-14	2.53E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143810	SLAPS Loadout	06/19/12	Gross Alpha/Beta	Gross Alpha	9.44E-16	4.57E-15	8.78E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.84E-14	1.65E-14	2.52E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143811	SLAPS Loadout	06/20/12	Gross Alpha/Beta	Gross Alpha	-1.81E-16	3.80E-15	8.40E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.45E-14	1.64E-14	2.41E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143812	SLAPS Loadout	06/20/12	Gross Alpha/Beta	Gross Alpha	5.38E-15	6.33E-15	8.62E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.88E-14	1.63E-14	2.47E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143813	SLAPS Loadout	06/20/12	Gross Alpha/Beta	Gross Alpha	9.84E-16	4.77E-15	9.15E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.27E-14	1.84E-14	2.63E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143814	SLAPS Loadout	06/20/12	Gross Alpha/Beta	Gross Alpha	4.55E-15	6.31E-15	9.19E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.25E-14	1.67E-14	2.64E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143815	SLAPS Loadout	06/20/12	Gross Alpha/Beta	Gross Alpha	6.92E-16	5.34E-15	1.07E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.50E-14	1.26E-14	1.82E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143816	SLAPS Loadout	06/21/12	Gross Alpha/Beta	Gross Alpha	-4.66E-16	4.51E-15	1.01E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.42E-15	1.11E-14	1.71E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143817	SLAPS Loadout	06/21/12	Gross Alpha/Beta	Gross Alpha	9.68E-15	8.87E-15	1.15E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.52E-14	1.46E-14	1.95E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143818	SLAPS Loadout	06/21/12	Gross Alpha/Beta	Gross Alpha	7.44E-16	5.743E-15	1.153E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.842E-14	1.494E-14	1.954E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143819	SLAPS Loadout	06/21/12	Gross Alpha/Beta	Gross Alpha	8.40E-15	8.49E-15	1.15E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.79E-15	1.26E-14	1.95E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143820	SLAPS Loadout	06/21/12	Gross Alpha/Beta	Gross Alpha	3.04E-15	6.25E-15	1.06E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.30E-14	1.45E-14	1.80E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143821	SLAPS Loadout	06/25/12	Gross Alpha/Beta	Gross Alpha	7.85E-15	8.97E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.97E-14	1.63E-14	1.94E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143822	SLAPS Loadout	06/25/12	Gross Alpha/Beta	Gross Alpha	2.63E-15	7.32E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.33E-14	1.68E-14	1.95E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143823	SLAPS Loadout	06/25/12	Gross Alpha/Beta	Gross Alpha	-1.30E-15	5.67E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.62E-14	1.48E-14	1.93E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143824	SLAPS Loadout	06/25/12	Gross Alpha/Beta	Gross Alpha	5.85E-15	7.67E-15	1.01E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.05E-14	1.61E-14	1.74E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143825	SLAPS Loadout	06/25/12	Gross Alpha/Beta	Gross Alpha	4.47E-15	6.98E-15	9.66E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.68E-14	1.32E-14	1.66E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143826	SLAPS Loadout	06/26/12	Gross Alpha/Beta	Gross Alpha	1.84E-15	5.11E-15	7.94E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.37E-14	9.90E-15	1.36E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143827	SLAPS Loadout	06/26/12	Gross Alpha/Beta	Gross Alpha	1.10E-15	5.70E-15	9.49E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-4.69E-16	9.62E-15	1.63E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143828	SLAPS Loadout	06/26/12	Gross Alpha/Beta	Gross Alpha	8.04E-15	8.20E-15	9.92E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.23E-14	1.30E-14	1.71E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143829	SLAPS Loadout	06/26/12	Gross Alpha/Beta	Gross Alpha	2.55E-15	5.03E-15	7.35E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.38E-14	9.30E-15	1.26E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143830	SLAPS Loadout	06/26/12	Gross Alpha/Beta	Gross Alpha	8.12E-16	4.22E-15	7.02E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.01E-14	8.50E-15	1.21E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143831	SLAPS Loadout	06/27/12	Gross Alpha/Beta	Gross Alpha	-7.90E-16	3.44E-15	6.82E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.38E-14	8.75E-15	1.17E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143832	SLAPS Loadout	06/27/12	Gross Alpha/Beta	Gross Alpha	1.97E-15	5.49E-15	8.52E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.11E-14	1.14E-14	1.47E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143833	SLAPS Loadout	06/27/12	Gross Alpha/Beta	Gross Alpha	9.83E-16	5.11E-15	8.49E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.16E-14	1.14E-14	1.46E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143834	SLAPS Loadout	06/27/12	Gross Alpha/Beta	Gross Alpha	4.86E-15	6.37E-15	8.39E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.01E-14	1.22E-14	1.44E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143835	SLAPS Loadout	06/27/12	Gross Alpha/Beta	Gross Alpha	1.36E-15	7.94E-15	1.17E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.11E-15	1.75E-14	3.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143836	SLAPS Loadout	06/28/12	Gross Alpha/Beta	Gross Alpha	1.048E-14	9.466E-15	1.006E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.528E-14	1.677E-14	2.634E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143837	SLAPS Loadout	06/28/12	Gross Alpha/Beta	Gross Alpha	1.479E-15	4.564E-15	6.389E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.981E-14	1.098E-14	1.673E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143838	SLAPS Loadout	06/28/12	Gross Alpha/Beta	Gross Alpha	9.25E-16	5.40E-15	7.99E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.83E-14	1.32E-14	2.09E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143839	SLAPS Loadout	06/28/12	Gross Alpha/Beta	Gross Alpha	1.84E-15	5.66E-15	7.93E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.89E-15	1.15E-14	2.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143840	SLAPS Loadout	06/28/12	Gross Alpha/Beta	Gross Alpha	-1.25E-15	6.39E-15	1.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.13E-15	1.63E-14	2.83E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143841	SLAPS Loadout	07/03/12	Gross Alpha/Beta	Gross Alpha	8.19E-15	9.36E-15	1.18E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.01E-14	1.58E-14	2.03E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143842	SLAPS Loadout	07/03/12	Gross Alpha/Beta	Gross Alpha	5.64E-15	7.39E-15	9.74E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.33E-14	1.17E-14	1.67E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143843	SLAPS Loadout	07/03/12	Gross Alpha/Beta	Gross Alpha	-1.02E-15	4.44E-15	8.80E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.24E-14	1.18E-14	1.51E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143844	SLAPS Loadout	07/03/12	Gross Alpha/Beta	Gross Alpha	8.755E-15	8.931E-15	1.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.913E-14	1.467E-14	1.857E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143845	SLAPS Loadout	07/03/12	Gross Alpha/Beta	Gross Alpha	4.859E-15	7.583E-15	1.049E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.194E-14	1.233E-14	1.803E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143846	SLAPS Loadout	07/05/12	Gross Alpha/Beta	Gross Alpha	5.94E-16	7.29E-15	1.32E-14	aCi/L	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.18E-14	1.63E-14	2.26E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143847	SLAPS Loadout	07/05/12	Gross Alpha/Beta	Gross Alpha	3.06E-15	8.52E-15	1.32E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.96E-14	1.84E-14	2.27E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143848	SLAPS Loadout	07/05/12	Gross Alpha/Beta	Gross Alpha	7.66E-15	1.00E-14	1.32E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.94E-14	1.94E-14	2.27E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143849	SLAPS Loadout	07/05/12	Gross Alpha/Beta	Gross Alpha	-3.06E-15	5.92E-15	1.32E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.98E-14	1.73E-14	2.27E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143850	SLAPS Loadout	07/05/12	Gross Alpha/Beta	Gross Alpha	3.06E-15	8.52E-15	1.32E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.57E-14	1.80E-14	2.27E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143851	SLAPS Loadout	07/02/12	Gross Alpha/Beta	Gross Alpha	5.72E-15	9.13E-15	1.27E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.39E-14	1.72E-14	2.22E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143852	SLAPS Loadout	07/02/12	Gross Alpha/Beta	Gross Alpha	1.51E-14	1.01E-14	1.02E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.37E-14	1.55E-14	1.78E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143853	SLAPS Loadout	07/02/12	Gross Alpha/Beta	Gross Alpha	7.73E-15	7.99E-15	9.75E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.32E-14	1.59E-14	1.70E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143854	SLAPS Loadout	07/02/12	Gross Alpha/Beta	Gross Alpha	6.935E-15	7.167E-15	8.741E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.587E-14	1.21E-14	1.526E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143855	SLAPS Loadout	07/02/12	Gross Alpha/Beta	Gross Alpha	4.949E-15	6.607E-15	8.776E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.629E-14	1.106E-14	1.532E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143856	SLAPS Loadout	07/09/12	Gross Alpha/Beta	Gross Alpha	7.26E-15	9.70E-15	1.29E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.43E-14	1.74E-14	2.25E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143857	SLAPS Loadout	07/09/12	Gross Alpha/Beta	Gross Alpha	6.31E-15	8.42E-15	1.12E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.50E-14	1.34E-14	1.95E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143858	SLAPS Loadout	07/09/12	Gross Alpha/Beta	Gross Alpha	5.08E-15	8.10E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.01E-14	1.53E-14	1.97E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143859	SLAPS Loadout	07/09/12	Gross Alpha/Beta	Gross Alpha	6.10E-15	7.08E-15	8.99E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.93E-14	1.16E-14	1.57E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143860	SLAPS Loadout	07/09/12	Gross Alpha/Beta	Gross Alpha	6.99E-15	7.22E-15	8.81E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.83E-14	1.13E-14	1.54E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143861	SLAPS Loadout	07/10/12	Gross Alpha/Beta	Gross Alpha	2.31E-15	6.71E-15	1.05E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.41E-14	1.26E-14	1.83E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143862	SLAPS Loadout	07/10/12	Gross Alpha/Beta	Gross Alpha	9.53E-15	8.93E-15	1.05E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.34E-14	1.48E-14	1.83E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143863	SLAPS Loadout	07/10/12	Gross Alpha/Beta	Gross Alpha	4.71E-15	7.52E-15	1.05E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.64E-14	1.51E-14	1.83E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143864	SLAPS Loadout	07/10/12	Gross Alpha/Beta	Gross Alpha	2.035E-14	1.149E-14	1.049E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.335E-14	1.476E-14	1.831E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143865	SLAPS Loadout	07/10/12	Gross Alpha/Beta	Gross Alpha	5.972E-15	7.973E-15	1.059E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.068E-14	1.562E-14	1.849E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143866	SLAPS Loadout	07/11/12	Gross Alpha/Beta	Gross Alpha	-1.02E-16	5.86E-15	1.06E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.66E-14	1.30E-14	1.86E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143867	SLAPS Loadout	07/11/12	Gross Alpha/Beta	Gross Alpha	4.78E-15	7.63E-15	1.06E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.84E-14	1.44E-14	1.86E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143868	SLAPS Loadout	07/11/12	Gross Alpha/Beta	Gross Alpha	2.34E-15	6.80E-15	1.06E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.98E-14	1.34E-14	1.86E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143869	SLAPS Loadout	07/11/12	Gross Alpha/Beta	Gross Alpha	1.12E-14	9.67E-15	1.10E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.95E-14	1.37E-14	1.91E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143870	SLAPS Loadout	07/11/12	Gross Alpha/Beta	Gross Alpha	3.32E-15	6.74E-15	9.92E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.62E-14	1.23E-14	1.73E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143871	SLAPS Loadout	07/12/12	Gross Alpha/Beta	Gross Alpha	2.20E-15	6.40E-15	1.00E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.99E-14	1.49E-14	1.75E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143872	SLAPS Loadout	07/12/12	Gross Alpha/Beta	Gross Alpha	1.039E-15	5.895E-15	9.878E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.18E-14	1.166E-14	1.724E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143873	SLAPS Loadout	07/12/12	Gross Alpha/Beta	Gross Alpha	3.492E-15	7.092E-15	1.044E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.855E-14	1.622E-14	1.823E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143874	SLAPS Loadout	07/12/12	Gross Alpha/Beta	Gross Alpha	2.30E-15	6.68E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.55E-14	1.59E-14	1.82E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143875	SLAPS Loadout	07/12/12	Gross Alpha/Beta	Gross Alpha	1.09E-15	6.20E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.29E-14	1.66E-14	1.81E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143876	SLAPS Loadout	07/16/12	Gross Alpha/Beta	Gross Alpha	8.28E-15	1.11E-14	1.47E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.91E-15	1.62E-14	2.56E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143877	SLAPS Loadout	07/16/12	Gross Alpha/Beta	Gross Alpha	3.41E-15	9.92E-15	1.55E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.74E-14	1.82E-14	2.71E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143878	SLAPS Loadout	07/16/12	Gross Alpha/Beta	Gross Alpha	5.19E-15	1.05E-14	1.55E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.57E-15	1.62E-14	2.71E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143879	SLAPS Loadout	07/16/12	Gross Alpha/Beta	Gross Alpha	-1.48E-16	8.55E-15	1.55E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.99E-15	1.67E-14	2.71E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143880	SLAPS Loadout	07/16/12	Gross Alpha/Beta	Gross Alpha	5.75E-15	7.68E-15	1.02E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.52E-14	1.24E-14	1.78E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143881	SLAPS Loadout	07/17/12	Gross Alpha/Beta	Gross Alpha	-1.03E-16	5.92E-15	1.08E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.71E-14	1.44E-14	1.88E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143882	SLAPS Loadout	07/17/12	Gross Alpha/Beta	Gross Alpha	1.22E-14	9.75E-15	1.07E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.09E-14	1.47E-14	1.87E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143883	SLAPS Loadout	07/17/12	Gross Alpha/Beta	Gross Alpha	1.119E-15	6.351E-15	1.064E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.193E-14	1.247E-14	1.858E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143884	SLAPS Loadout	07/17/12	Gross Alpha/Beta	Gross Alpha	7.09E-15	8.22E-15	1.04E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.09E-14	1.45E-14	1.82E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143885	SLAPS Loadout	07/17/12	Gross Alpha/Beta	Gross Alpha	-2.46E-15	4.58E-15	1.03E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.05E-14	1.42E-14	1.80E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143886	SLAPS Loadout	07/18/12	Gross Alpha/Beta	Gross Alpha	8.36E-15	8.64E-15	1.05E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.11E-14	1.35E-14	1.84E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143887	SLAPS Loadout	07/18/12	Gross Alpha/Beta	Gross Alpha	1.19E-14	9.56E-15	1.05E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.26E-14	1.47E-14	1.83E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143888	SLAPS Loadout	07/18/12	Gross Alpha/Beta	Gross Alpha	4.646E-15	7.415E-15	1.034E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.68E-14	1.39E-14	1.805E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143889	SLAPS Loadout	07/18/12	Gross Alpha/Beta	Gross Alpha	6.921E-15	8.027E-15	1.02E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.543E-14	1.466E-14	1.78E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143890	SLAPS Loadout	07/18/12	Gross Alpha/Beta	Gross Alpha	1.468E-14	1.019E-14	1.152E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.184E-14	1.713E-14	1.967E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143891	SLAPS Loadout	07/19/12	Gross Alpha/Beta	Gross Alpha	5.848E-15	1.546E-14	2.662E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.804E-14	3.006E-14	4.547E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143892	SLAPS Loadout	07/19/12	Gross Alpha/Beta	Gross Alpha	9.5E-15	1.806E-14	2.922E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.102E-15	2.976E-14	4.991E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143893	SLAPS Loadout	07/19/12	Gross Alpha/Beta	Gross Alpha	6.498E-15	1.718E-14	2.958E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.166E-15	2.959E-14	5.052E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143894	SLAPS Loadout	07/19/12	Gross Alpha/Beta	Gross Alpha	6.579E-15	1.739E-14	2.995E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.278E-15	3.104E-14	5.115E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143895	SLAPS Loadout	07/19/12	Gross Alpha/Beta	Gross Alpha	2.851E-15	1.351E-14	2.496E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.304E-14	2.898E-14	4.263E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143896	SLAPS Loadout	07/21/12	Gross Alpha/Beta	Gross Alpha	6.354E-15	6.979E-15	1.028E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.134E-14	1.576E-14	1.744E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143897	SLAPS Loadout	07/21/12	Gross Alpha/Beta	Gross Alpha	9.124E-15	8.127E-15	1.087E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.216E-14	1.652E-14	1.844E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143898	SLAPS Loadout	07/23/12	Gross Alpha/Beta	Gross Alpha	9.124E-15	8.127E-15	1.087E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.83E-14	1.615E-14	1.844E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143899	SLAPS Loadout	07/23/12	Gross Alpha/Beta	Gross Alpha	6.782E-15	7.449E-15	1.098E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.711E-14	1.615E-14	1.861E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143900	SLAPS Loadout	07/21/12	Gross Alpha/Beta	Gross Alpha	1.951E-15	5.727E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.845E-14	1.647E-14	1.889E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143901	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	6.983E-15	7.67E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.897E-14	1.465E-14	1.917E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143902	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	1.98E-15	5.812E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.581E-14	1.64E-14	1.917E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143903	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	4.482E-15	6.805E-15	1.13E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.779E-14	1.559E-14	1.917E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143904	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	9.438E-15	8.407E-15	1.125E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.447E-14	1.518E-14	1.907E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143905	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	8.63E-15	7.687E-15	1.028E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.593E-14	1.707E-14	1.744E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143906	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	8.153E-15	7.99E-15	1.119E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.435E-14	1.511E-14	1.898E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143907	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	3.168E-15	6.205E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.096E-14	1.463E-14	1.88E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143908	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	5.594E-15	7.075E-15	1.103E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.008E-14	1.447E-14	1.87E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143909	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	7.05E-16	5.07E-15	1.092E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.144E-14	1.45E-14	1.853E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143910	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	1.141E-15	5.288E-15	9.523E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.717E-14	1.7E-14	2.709E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143915	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.496E-14	1.632E-14	2.465E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143916	SLAPS Loadout	07/30/12	Gross Alpha/Beta	Gross Alpha	1.157E-14	8.478E-15	9.054E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.371E-14	1.854E-14	2.741E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143917	SLAPS Loadout	07/30/12	Gross Alpha/Beta	Gross Alpha	5.318E-15	6.367E-15	9.054E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.53E-14	1.868E-14	2.741E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143918	SLAPS Loadout	07/30/12	Gross Alpha/Beta	Gross Alpha	9.071E-15	7.703E-15	9.054E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.054E-14	1.827E-14	2.741E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143919	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	1.129E-14	8.272E-15	8.834E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.076E-14	2.035E-14	2.674E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143920	SLAPS Loadout	07/30/12	Gross Alpha/Beta	Gross Alpha	7.21E-15	6.717E-15	8.348E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.596E-14	1.665E-14	2.527E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143921	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	1.691E-14	9.633E-15	8.584E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.979E-14	1.983E-14	2.599E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143922	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	6.228E-15	6.486E-15	8.584E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.28E-14	2.006E-14	2.599E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143923	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	9.787E-15	7.68E-15	8.584E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.444E-14	1.693E-14	2.599E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143924	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	1.883E-14	9.967E-15	8.386E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.119E-14	2.104E-14	2.539E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143925	SLAPS Loadout	07/31/12	Gross Alpha/Beta	Gross Alpha	1.193E-14	8.226E-15	8.425E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.097E-14	1.806E-14	2.551E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144944	SLAPS Loadout	08/01/12	Gross Alpha/Beta	Gross Alpha	1.453E-14	9.029E-15	8.584E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.452E-14	1.942E-14	2.599E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144945	SLAPS Loadout	08/01/12	Gross Alpha/Beta	Gross Alpha	6.258E-15	6.517E-15	8.625E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.74E-14	1.811E-14	2.611E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144946	SLAPS Loadout	08/01/12	Gross Alpha/Beta	Gross Alpha	3.784E-15	5.448E-15	8.425E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.956E-14	1.621E-14	2.551E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144947	SLAPS Loadout	08/01/12	Gross Alpha/Beta	Gross Alpha	1.205E-14	8.303E-15	8.504E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.997E-14	1.97E-14	2.574E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144948	SLAPS Loadout	08/01/12	Gross Alpha/Beta	Gross Alpha	1.365E-15	5.587E-15	1.101E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.005E-14	1.516E-14	1.777E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144949	SLAPS Loadout	08/02/12	Gross Alpha/Beta	Gross Alpha	1.053E-14	9.192E-15	1.213E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.827E-14	1.711E-14	1.958E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144950	SLAPS Loadout	08/02/12	Gross Alpha/Beta	Gross Alpha	7.99E-15	8.48E-15	1.219E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.443E-14	1.468E-14	1.968E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144951	SLAPS Loadout	08/02/12	Gross Alpha/Beta	Gross Alpha	2.793E-15	6.675E-15	1.213E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.513E-14	1.47E-14	1.958E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144952	SLAPS Loadout	08/02/12	Gross Alpha/Beta	Gross Alpha	1.425E-14	1.012E-14	1.201E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.451E-14	1.662E-14	1.938E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144953	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	2.145E-14	1.08E-14	8.834E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.081E-13	2.984E-14	2.69E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144954	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	2.258E-15	4.698E-15	8.072E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.625E-14	1.78E-14	2.458E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144955	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	1.131E-14	8.517E-15	9.271E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.322E-14	1.811E-14	2.824E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA144956	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	2.581E-15	5.369E-15	9.226E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.443E-15	1.76E-14	2.81E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA144957	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	2.594E-15	5.395E-15	9.271E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.032E-14	1.872E-14	2.824E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA144958	SLAPS Loadout	08/06/12	Gross Alpha/Beta	Gross Alpha	3.462E-15	5.359E-15	8.361E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.402E-14	1.735E-14	2.546E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144959	SLAPS Loadout	08/07/12	Gross Alpha/Beta	Gross Alpha	1.267E-15	4.497E-15	8.711E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.022E-14	1.85E-14	2.653E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144960	SLAPS Loadout	08/07/12	Gross Alpha/Beta	Gross Alpha	1.25E-15	4.435E-15	8.591E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.249E-14	1.765E-14	2.616E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144961	SLAPS Loadout	08/07/12	Gross Alpha/Beta	Gross Alpha	5.919E-15	6.46E-15	8.67E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.86E-14	1.83E-14	2.641E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144962	SLAPS Loadout	08/07/12	Gross Alpha/Beta	Gross Alpha	9.4E-17	3.719E-15	8.436E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.717E-14	1.854E-14	2.569E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144963	SLAPS Loadout	08/07/12	Gross Alpha/Beta	Gross Alpha	6.267E-15	6.84E-15	9.18E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.608E-14	2.136E-14	2.796E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144964	SLAPS Loadout	08/08/12	Gross Alpha/Beta	Gross Alpha	2.646E-15	5.504E-15	9.459E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.201E-14	2.003E-14	2.881E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144965	SLAPS Loadout	08/08/12	Gross Alpha/Beta	Gross Alpha	3.897E-15	6.032E-15	9.411E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.665E-14	2.031E-14	2.866E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144966	SLAPS Loadout	08/08/12	Gross Alpha/Beta	Gross Alpha	3.916E-15	6.062E-15	9.459E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.248E-14	2.085E-14	2.881E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144967	SLAPS Loadout	08/08/12	Gross Alpha/Beta	Gross Alpha	1.417E-15	5.802E-15	1.143E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.405E-14	1.694E-14	1.845E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144968	SLAPS Loadout	08/08/12	Gross Alpha/Beta	Gross Alpha	3.479E-15	6.098E-15	1.034E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.48E-14	1.396E-14	1.669E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144969	SLAPS Loadout	08/09/12	Gross Alpha/Beta	Gross Alpha	4.577E-15	6.482E-15	1.034E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.564E-14	1.299E-14	1.669E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144970	SLAPS Loadout	08/09/12	Gross Alpha/Beta	Gross Alpha	-3.509E-15	3.234E-15	1.166E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.415E-14	1.412E-14	1.881E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144971	SLAPS Loadout	08/09/12	Gross Alpha/Beta	Gross Alpha	1.459E-15	5.974E-15	1.177E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.844E-14	1.676E-14	1.9E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144972	SLAPS Loadout	08/09/12	Gross Alpha/Beta	Gross Alpha	1.424E-15	5.83E-15	1.149E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.363E-14	1.272E-14	1.854E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144973	SLAPS Loadout	08/09/12	Gross Alpha/Beta	Gross Alpha	1.438E-15	5.887E-15	1.16E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.019E-15	1.225E-14	1.872E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA144974	SLAPS Loadout	08/13/12	Gross Alpha/Beta	Gross Alpha	4.053E-15	6.356E-15	1.09E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.837E-14	1.276E-14	1.849E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144975	SLAPS Loadout	08/13/12	Gross Alpha/Beta	Gross Alpha	-6.89E-16	4.208E-15	1.085E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.175E-14	1.525E-14	1.84E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144976	SLAPS Loadout	08/13/12	Gross Alpha/Beta	Gross Alpha	-1E-14	1.864E-14	5.804E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.95E-14	6.449E-14	9.846E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA144977	SLAPS Loadout	08/13/12	Gross Alpha/Beta	Gross Alpha	2.935E-15	6.038E-15	1.116E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.672E-14	1.506E-14	1.893E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144978	SLAPS Loadout	08/13/12	Gross Alpha/Beta	Gross Alpha	4.7E-16	4.61E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.265E-14	1.383E-14	1.758E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144979	SLAPS Loadout	08/15/12	Gross Alpha/Beta	Gross Alpha	4.74E-16	4.651E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.024E-14	1.471E-14	1.774E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA144980	SLAPS Loadout	08/15/12	Gross Alpha/Beta	Gross Alpha	4.252E-15	6.669E-15	1.144E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.407E-14	1.395E-14	1.94E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144981	SLAPS Loadout	08/15/12	Gross Alpha/Beta	Gross Alpha	4.232E-15	6.636E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.427E-14	1.502E-14	1.931E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144982	SLAPS Loadout	08/15/12	Gross Alpha/Beta	Gross Alpha	1.755E-15	5.635E-15	1.138E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.951E-14	1.451E-14	1.931E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144983	SLAPS Loadout	08/15/12	Gross Alpha/Beta	Gross Alpha	3.978E-15	6.239E-15	1.07E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.52E-14	1.444E-14	1.815E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144984	SLAPS Loadout	08/16/12	Gross Alpha/Beta	Gross Alpha	3.084E-15	6.343E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.594E-14	1.657E-14	1.989E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144985	SLAPS Loadout	08/16/12	Gross Alpha/Beta	Gross Alpha	5.32E-16	5.215E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.531E-14	1.548E-14	1.989E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144986	SLAPS Loadout	08/16/12	Gross Alpha/Beta	Gross Alpha	8.147E-15	8.102E-15	1.167E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.269E-14	1.514E-14	1.979E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144987	SLAPS Loadout	08/16/12	Gross Alpha/Beta	Gross Alpha	4.4E-16	4.581E-15	9.713E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.479E-14	1.219E-14	1.695E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144988	SLAPS Loadout	08/16/12	Gross Alpha/Beta	Gross Alpha	1.657E-15	5.583E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.435E-15	1.091E-14	1.875E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA144989	SLAPS Loadout	08/20/12	Gross Alpha/Beta	Gross Alpha	1.612E-15	5.432E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.471E-14	1.4E-14	1.824E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144990	SLAPS Loadout	08/20/12	Gross Alpha/Beta	Gross Alpha	8.441E-15	7.786E-15	1.046E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.45E-14	1.288E-14	1.824E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144991	SLAPS Loadout	08/20/12	Gross Alpha/Beta	Gross Alpha	4.74E-16	4.932E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.106E-14	1.361E-14	1.824E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144992	SLAPS Loadout	08/20/12	Gross Alpha/Beta	Gross Alpha	4.982E-15	6.653E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.729E-14	1.417E-14	1.808E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144993	SLAPS Loadout	08/20/12	Gross Alpha/Beta	Gross Alpha	1.598E-15	5.383E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.079E-14	1.349E-14	1.808E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144994	SLAPS Loadout	08/30/12	Gross Alpha/Beta	Gross Alpha	7.891E-15	9.311E-15	1.328E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.887E-14	2.469E-14	3.401E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA144995	SLAPS Loadout	08/21/12	Gross Alpha/Beta	Gross Alpha	4.034E-15	6.55E-15	1.085E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.601E-14	1.452E-14	1.893E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144996	SLAPS Loadout	08/21/12	Gross Alpha/Beta	Gross Alpha	-6.82E-16	4.497E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.343E-14	1.415E-14	1.875E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144997	SLAPS Loadout	08/21/12	Gross Alpha/Beta	Gross Alpha	7.369E-15	7.513E-15	1.055E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.386E-14	1.502E-14	1.841E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144998	SLAPS Loadout	08/21/12	Gross Alpha/Beta	Gross Alpha	3.888E-15	6.314E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.836E-14	1.437E-14	1.824E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA144999	SLAPS Loadout	08/21/12	Gross Alpha/Beta	Gross Alpha	7.505E-15	7.652E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.917E-14	1.574E-14	1.875E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145000	SLAPS Loadout	08/22/12	Gross Alpha/Beta	Gross Alpha	6.002E-15	6.902E-15	1.018E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.658E-14	1.491E-14	1.776E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145001	SLAPS Loadout	08/22/12	Gross Alpha/Beta	Gross Alpha	5.166E-15	6.899E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.743E-14	1.349E-14	1.875E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145002	SLAPS Loadout	08/22/12	Gross Alpha/Beta	Gross Alpha	1.648E-14	9.894E-15	1.05E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.733E-14	1.531E-14	1.833E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145003	SLAPS Loadout	08/22/12	Gross Alpha/Beta	Gross Alpha	9.755E-15	8.262E-15	1.065E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.238E-14	1.394E-14	1.858E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145004	SLAPS Loadout	08/22/12	Gross Alpha/Beta	Gross Alpha	4.81E-16	4.999E-15	1.06E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.3E-14	1.164E-14	1.849E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145005	SLAPS Loadout	08/23/12	Gross Alpha/Beta	Gross Alpha	1.081E-14	8.504E-15	1.055E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.343E-14	1.594E-14	1.841E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145006	SLAPS Loadout	08/23/12	Gross Alpha/Beta	Gross Alpha	4.982E-15	6.653E-15	1.036E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.814E-14	1.524E-14	1.808E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145007	SLAPS Loadout	08/23/12	Gross Alpha/Beta	Gross Alpha	1.57E-15	5.289E-15	1.018E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.729E-14	1.498E-14	1.776E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145008	SLAPS Loadout	08/23/12	Gross Alpha/Beta	Gross Alpha	5.072E-15	6.774E-15	1.055E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.503E-14	1.412E-14	1.841E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145009	SLAPS Loadout	08/23/12	Gross Alpha/Beta	Gross Alpha	9.052E-15	8.351E-15	1.121E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.852E-14	1.8E-14	1.957E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145011	SLAPS Loadout	08/27/12	Gross Alpha/Beta	Gross Alpha	4.039E-15	6.927E-15	1.121E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.397E-15	1.852E-14	2.869E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145012	SLAPS Loadout	08/27/12	Gross Alpha/Beta	Gross Alpha	5.521E-15	7.645E-15	1.157E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.429E-15	1.919E-14	2.962E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145013	SLAPS Loadout	08/27/12	Gross Alpha/Beta	Gross Alpha	1.09E-16	5.233E-15	1.121E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.567E-15	1.844E-14	2.869E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145014	SLAPS Loadout	08/27/12	Gross Alpha/Beta	Gross Alpha	2.36E-15	5.546E-15	9.691E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.616E-14	1.701E-14	2.482E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145015	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	5.619E-15	9.637E-15	1.559E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.026E-14	2.935E-14	3.992E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145016	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	1.352E-14	1.073E-14	1.273E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.896E-14	2.534E-14	3.26E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145017	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	1.24E-16	5.946E-15	1.273E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.104E-14	2.397E-14	3.26E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145018	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	1.05E-16	5.024E-15	1.076E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.33E-14	2.379E-14	2.755E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145019	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	2.36E-15	5.546E-15	9.691E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.986E-14	1.891E-14	2.482E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145020	SLAPS Loadout	08/29/12	Gross Alpha/Beta	Gross Alpha	9.5E-17	4.567E-15	9.779E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.848E-14	1.735E-14	2.504E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145021	SLAPS Loadout	08/29/12	Gross Alpha/Beta	Gross Alpha	3.557E-15	6.101E-15	9.868E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.231E-14	1.781E-14	2.527E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145022	SLAPS Loadout	08/29/12	Gross Alpha/Beta	Gross Alpha	3.557E-15	6.101E-15	9.868E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.913E-14	1.915E-14	2.527E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145023	SLAPS Loadout	08/29/12	Gross Alpha/Beta	Gross Alpha	1.25E-15	5.154E-15	9.868E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.401E-14	1.875E-14	2.527E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145024	SLAPS Loadout	08/28/12	Gross Alpha/Beta	Gross Alpha	1.333E-14	9.541E-15	1.156E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.721E-14	1.445E-14	1.828E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145025	SLAPS Loadout	08/30/12	Gross Alpha/Beta	Gross Alpha	4.356E-15	9.811E-15	1.737E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.487E-14	2.263E-14	2.749E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145026	SLAPS Loadout	08/30/12	Gross Alpha/Beta	Gross Alpha	8.9E-16	8.662E-15	1.774E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.747E-14	1.887E-14	2.807E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145027	SLAPS Loadout	08/30/12	Gross Alpha/Beta	Gross Alpha	8.65E-16	8.425E-15	1.725E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.67E-14	1.953E-14	2.73E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145028	SLAPS Loadout	08/30/12	Gross Alpha/Beta	Gross Alpha	9.15E-16	8.914E-15	1.825E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.944E-14	1.956E-14	2.888E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145029	SLAPS Loadout	08/27/12	Gross Alpha/Beta	Gross Alpha	6.58E-16	6.407E-15	1.312E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.2E-14	1.416E-14	2.076E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145030	SLAPS Loadout	09/04/12	Gross Alpha/Beta	Gross Alpha	1.078E-14	1.341E-14	1.835E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.027E-14	3.648E-14	5.832E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145031	SLAPS Loadout	09/04/12	Gross Alpha/Beta	Gross Alpha	2.872E-15	5.704E-15	9.238E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.929E-14	1.873E-14	2.937E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145032	SLAPS Loadout	09/05/12	Gross Alpha/Beta	Gross Alpha	7.935E-15	1.195E-14	1.767E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.451E-14	3.473E-14	5.617E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145033	SLAPS Loadout	09/05/12	Gross Alpha/Beta	Gross Alpha	3.144E-15	1.005E-14	1.82E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-1.86E-15	3.326E-14	5.785E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145034	SLAPS Loadout	09/05/12	Gross Alpha/Beta	Gross Alpha	5.716E-15	1.135E-14	1.838E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.262E-14	3.496E-14	5.844E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145035	SLAPS Loadout	09/06/12	Gross Alpha/Beta	Gross Alpha	-9.16E-16	3.445E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.315E-14	1.914E-14	2.808E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145036	SLAPS Loadout	09/06/12	Gross Alpha/Beta	Gross Alpha	3.508E-15	5.284E-15	7.81E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.905E-14	1.607E-14	2.483E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145037	SLAPS Loadout	09/06/12	Gross Alpha/Beta	Gross Alpha	2.747E-15	5.455E-15	8.834E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.232E-14	1.824E-14	2.808E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145038	SLAPS Loadout	09/06/12	Gross Alpha/Beta	Gross Alpha	5.894E-15	6.348E-15	8.124E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.618E-14	1.806E-14	2.583E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145039	SLAPS Loadout	09/06/12	Gross Alpha/Beta	Gross Alpha	7.017E-15	6.734E-15	8.124E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.693E-14	1.731E-14	2.583E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145040	SLAPS Loadout	09/10/12	Gross Alpha/Beta	Gross Alpha	1.217E-14	8.537E-15	9.587E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.584E-14	1.48E-14	1.845E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145041	SLAPS Loadout	09/10/12	Gross Alpha/Beta	Gross Alpha	8.013E-15	7.632E-15	1.025E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.493E-14	1.656E-14	1.973E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145042	SLAPS Loadout	09/10/12	Gross Alpha/Beta	Gross Alpha	1.942E-15	5.702E-15	1.126E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.322E-14	1.661E-14	2.166E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145043	SLAPS Loadout	09/10/12	Gross Alpha/Beta	Gross Alpha	4.184E-15	6.161E-15	1.005E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.606E-15	1.359E-14	1.935E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145044	SLAPS Loadout	09/10/12	Gross Alpha/Beta	Gross Alpha	1.787E-15	5.246E-15	1.035E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.955E-14	1.615E-14	1.993E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145045	SLAPS Loadout	09/11/12	Gross Alpha/Beta	Gross Alpha	5.993E-15	6.388E-15	9.083E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.741E-14	1.53E-14	1.748E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145046	SLAPS Loadout	09/11/12	Gross Alpha/Beta	Gross Alpha	6.901E-15	7.356E-15	1.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.24E-14	1.553E-14	2.013E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145047	SLAPS Loadout	09/11/12	Gross Alpha/Beta	Gross Alpha	8.175E-15	7.786E-15	1.046E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.15E-14	1.648E-14	2.013E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145048	SLAPS Loadout	09/11/12	Gross Alpha/Beta	Gross Alpha	1.334E-14	9.36E-15	1.051E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.912E-14	1.826E-14	2.023E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145049	SLAPS Loadout	09/11/12	Gross Alpha/Beta	Gross Alpha	4.267E-15	6.283E-15	1.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.925E-14	1.599E-14	1.973E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145050	SLAPS Loadout	09/12/12	Gross Alpha/Beta	Gross Alpha	5.018E-15	6.153E-15	9.328E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.252E-14	1.514E-14	1.796E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145051	SLAPS Loadout	09/12/12	Gross Alpha/Beta	Gross Alpha	5.488E-15	6.729E-15	1.02E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.96E-14	1.695E-14	1.964E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145052	SLAPS Loadout	09/12/12	Gross Alpha/Beta	Gross Alpha	3.003E-15	5.735E-15	1.02E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.202E-14	1.719E-14	1.964E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145053	SLAPS Loadout	09/12/12	Gross Alpha/Beta	Gross Alpha	8.013E-15	7.632E-15	1.025E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.628E-14	1.766E-14	1.973E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145054	SLAPS Loadout	09/12/12	Gross Alpha/Beta	Gross Alpha	3.018E-15	5.764E-15	1.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.034E-14	1.505E-14	1.973E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145055	SLAPS Loadout	09/13/12	Gross Alpha/Beta	Gross Alpha	4.842E-15	7.13E-15	1.163E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.964E-14	1.879E-14	2.239E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145056	SLAPS Loadout	09/13/12	Gross Alpha/Beta	Gross Alpha	1.193E-14	9.548E-15	1.163E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.516E-14	1.934E-14	2.239E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145057	SLAPS Loadout	09/13/12	Gross Alpha/Beta	Gross Alpha	6.259E-15	7.674E-15	1.163E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.516E-14	1.934E-14	2.239E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145058	SLAPS Loadout	09/13/12	Gross Alpha/Beta	Gross Alpha	2.008E-15	5.894E-15	1.163E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.296E-14	1.594E-14	2.239E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145059	SLAPS Loadout	09/13/12	Gross Alpha/Beta	Gross Alpha	2.822E-15	5.39E-15	9.587E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.887E-14	1.511E-14	1.845E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145060	SLAPS Loadout	09/17/12	Gross Alpha/Beta	Gross Alpha	1.869E-14	1.084E-14	1.064E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.506E-14	2.364E-14	2.845E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145061	SLAPS Loadout	09/17/12	Gross Alpha/Beta	Gross Alpha	1.818E-15	5.427E-15	1.053E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.023E-14	2.088E-14	2.816E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145062	SLAPS Loadout	09/17/12	Gross Alpha/Beta	Gross Alpha	1.799E-15	5.372E-15	1.043E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.717E-14	2.122E-14	2.787E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145063	SLAPS Loadout	09/17/12	Gross Alpha/Beta	Gross Alpha	3.039E-15	5.883E-15	1.032E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.956E-14	2.196E-14	2.759E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145064	SLAPS Loadout	09/17/12	Gross Alpha/Beta	Gross Alpha	6.311E-15	7.813E-15	1.173E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.537E-14	2.561E-14	3.136E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145065	SLAPS Loadout	09/19/12	Gross Alpha/Beta	Gross Alpha	1.713E-15	5.114E-15	9.927E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.849E-14	1.967E-14	2.653E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145066	SLAPS Loadout	09/18/12	Gross Alpha/Beta	Gross Alpha	5.29E-16	4.734E-15	1.043E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.154E-14	2.079E-14	2.787E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145067	SLAPS Loadout	09/18/12	Gross Alpha/Beta	Gross Alpha	9.42E-15	8.222E-15	1.043E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.201E-14	2.159E-14	2.787E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145068	SLAPS Loadout	09/19/12	Gross Alpha/Beta	Gross Alpha	3.07E-15	5.943E-15	1.043E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.785E-14	1.97E-14	2.787E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145069	SLAPS Loadout	09/19/12	Gross Alpha/Beta	Gross Alpha	6.88E-15	7.395E-15	1.043E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.637E-14	2.116E-14	2.787E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145070	SLAPS Loadout	09/20/12	Gross Alpha/Beta	Gross Alpha	-6.92E-16	3.73E-15	9.739E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	-6.27E-16	1.693E-14	2.603E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145071	SLAPS Loadout	09/20/12	Gross Alpha/Beta	Gross Alpha	8.965E-15	8.601E-15	1.147E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.823E-14	2.314E-14	3.066E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145072	SLAPS Loadout	09/20/12	Gross Alpha/Beta	Gross Alpha	6.171E-15	7.639E-15	1.147E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.229E-14	2.189E-14	3.066E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145073	SLAPS Loadout	09/20/12	Gross Alpha/Beta	Gross Alpha	4.774E-15	7.109E-15	1.147E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.052E-14	2.174E-14	3.066E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145074	SLAPS Loadout	09/20/12	Gross Alpha/Beta	Gross Alpha	1.979E-15	5.91E-15	1.147E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.292E-14	2.273E-14	3.066E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145075	SLAPS Loadout	09/24/12	Gross Alpha/Beta	Gross Alpha	-3.14E-16	4.661E-15	9.862E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.849E-15	1.562E-14	2.701E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145076	SLAPS Loadout	09/24/12	Gross Alpha/Beta	Gross Alpha	3.759E-15	6.935E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.733E-14	1.999E-14	2.936E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145077	SLAPS Loadout	09/24/12	Gross Alpha/Beta	Gross Alpha	3.759E-15	6.935E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.253E-14	2.044E-14	2.936E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145078	SLAPS Loadout	09/24/12	Gross Alpha/Beta	Gross Alpha	3.759E-15	6.935E-15	1.072E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2E-14	1.842E-14	2.936E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145079	SLAPS Loadout	09/24/12	Gross Alpha/Beta	Gross Alpha	2.418E-15	6.443E-15	1.084E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.249E-14	1.975E-14	2.969E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145080	SLAPS Loadout	09/25/12	Gross Alpha/Beta	Gross Alpha	6.106E-15	5.846E-15	7.095E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.044E-14	1.372E-14	1.943E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145081	SLAPS Loadout	09/25/12	Gross Alpha/Beta	Gross Alpha	5.202E-15	5.558E-15	7.095E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.249E-14	1.47E-14	1.943E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145082	SLAPS Loadout	09/25/12	Gross Alpha/Beta	Gross Alpha	7.062E-15	6.164E-15	7.146E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.547E-14	1.338E-14	1.958E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145083	SLAPS Loadout	09/25/12	Gross Alpha/Beta	Gross Alpha	2.488E-15	4.59E-15	7.095E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.274E-14	1.391E-14	1.943E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145084	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	1.184E-14	9.401E-15	1.097E-14	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.432E-14	1.635E-14	1.955E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145085	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	1.147E-14	7.264E-15	3.103E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.615E-14	1.179E-14	2.014E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145086	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	6.122E-15	5.481E-15	3.314E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.837E-14	1.486E-14	2.151E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145087	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	3.673E-15	4.244E-15	3.314E-15	µCi/mL	J	F01, T02	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.042E-14	1.396E-14	2.151E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145088	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	8.489E-15	6.425E-15	3.282E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.85E-14	1.48E-14	2.131E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145089	SLAPS Loadout	10/03/12	Gross Alpha/Beta	Gross Alpha	1.168E-15	2.336E-15	3.16E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.17E-14	1.13E-14	2.052E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145090	SLAPS Loadout	10/02/12	Gross Alpha/Beta	Gross Alpha	3.784E-15	4.371E-15	3.413E-15	µCi/mL	J	F01, T02	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.322E-14	1.328E-14	2.216E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145091	SLAPS Loadout	10/03/12	Gross Alpha/Beta	Gross Alpha	8.829E-15	6.682E-15	3.413E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.861E-14	1.618E-14	2.216E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145092	SLAPS Loadout	10/03/12	Gross Alpha/Beta	Gross Alpha	7.567E-15	6.185E-15	3.413E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.025E-14	1.635E-14	2.216E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145093	SLAPS Loadout	10/03/12	Gross Alpha/Beta	Gross Alpha	1.64E-14	9.115E-15	3.413E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.253E-14	1.758E-14	2.216E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145094	SLAPS Loadout	10/04/12	Gross Alpha/Beta	Gross Alpha	9.173E-15	6.495E-15	3.103E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.131E-13	1.86E-14	2.014E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145095	SLAPS Loadout	10/04/12	Gross Alpha/Beta	Gross Alpha	1.321E-14	7.982E-15	3.25E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.615E-14	1.332E-14	2.11E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145096	SLAPS Loadout	10/04/12	Gross Alpha/Beta	Gross Alpha	8.489E-15	6.425E-15	3.282E-15	µCi/mL	J	F01, T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.039E-13	1.83E-14	2.131E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145097	SLAPS Loadout	10/04/12	Gross Alpha/Beta	Gross Alpha	2.402E-15	3.399E-15	3.25E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.876E-14	1.582E-14	2.11E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145098	SLAPS Loadout	10/04/12	Gross Alpha/Beta	Gross Alpha	4.805E-15	4.808E-15	3.25E-15	µCi/mL	J	F01, T02	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.266E-14	1.621E-14	2.11E-15	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145099	SLAPS Loadout	10/08/12	Gross Alpha/Beta	Gross Alpha	8.661E-15	8.531E-15	1.073E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.001E-14	1.413E-14	1.856E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145100	SLAPS Loadout	10/08/12	Gross Alpha/Beta	Gross Alpha	4.104E-15	7.337E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.683E-14	1.292E-14	1.909E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145101	SLAPS Loadout	10/08/12	Gross Alpha/Beta	Gross Alpha	-7.01E-16	5.543E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.605E-14	1.283E-14	1.909E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145102	SLAPS Loadout	10/08/12	Gross Alpha/Beta	Gross Alpha	-1.902E-15	4.996E-15	1.104E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.633E-14	1.512E-14	1.909E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145103	SLAPS Loadout	10/08/12	Gross Alpha/Beta	Gross Alpha	5.255E-15	7.649E-15	1.093E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.517E-14	1.38E-14	1.891E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145104	SLAPS Loadout	10/09/12	Gross Alpha/Beta	Gross Alpha	6.633E-15	8.245E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.339E-14	1.606E-14	1.946E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145105	SLAPS Loadout	10/09/12	Gross Alpha/Beta	Gross Alpha	1.106E-14	9.953E-15	1.207E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.888E-14	1.644E-14	2.088E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145106	SLAPS Loadout	10/09/12	Gross Alpha/Beta	Gross Alpha	7.116E-15	8.846E-15	1.207E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.244E-14	1.339E-14	2.088E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145107	SLAPS Loadout	10/09/12	Gross Alpha/Beta	Gross Alpha	1.631E-14	1.126E-14	1.207E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.167E-14	1.775E-14	2.088E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145108	SLAPS Loadout	10/09/12	Gross Alpha/Beta	Gross Alpha	6.326E-15	7.863E-15	1.073E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.063E-14	1.524E-14	1.856E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145109	SLAPS Loadout	10/10/12	Gross Alpha/Beta	Gross Alpha	4.184E-15	7.48E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.193E-14	1.374E-14	1.946E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145110	SLAPS Loadout	10/10/12	Gross Alpha/Beta	Gross Alpha	7.857E-15	8.602E-15	1.125E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.226E-14	1.49E-14	1.946E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145111	SLAPS Loadout	10/10/12	Gross Alpha/Beta	Gross Alpha	9.082E-15	8.946E-15	1.125E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.034E-14	1.355E-14	1.946E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145112	SLAPS Loadout	10/10/12	Gross Alpha/Beta	Gross Alpha	5.356E-15	7.796E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.936E-14	1.333E-14	1.927E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145113	SLAPS Loadout	10/10/12	Gross Alpha/Beta	Gross Alpha	-3.133E-15	4.424E-15	1.114E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.093E-14	1.352E-14	1.927E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145114	SLAPS Loadout	10/16/12	Gross Alpha/Beta	Gross Alpha	5.803E-15	8.699E-15	1.319E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.079E-14	2.057E-14	2.168E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145115	SLAPS Loadout	10/16/12	Gross Alpha/Beta	Gross Alpha	1.106E-14	1.017E-14	1.319E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.606E-14	1.835E-14	2.168E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145116	SLAPS Loadout	10/16/12	Gross Alpha/Beta	Gross Alpha	-7.66E-16	6.411E-15	1.319E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.668E-14	1.744E-14	2.168E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145117	SLAPS Loadout	10/16/12	Gross Alpha/Beta	Gross Alpha	1.61E-15	6.409E-15	1.14E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.393E-14	1.53E-14	1.875E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145118	SLAPS Loadout	10/16/12	Gross Alpha/Beta	Gross Alpha	4.489E-15	8.291E-15	1.319E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.303E-14	1.603E-14	2.168E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145119	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	1.685E-14	1.55E-14	2.009E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.95E-14	2.27E-14	3.304E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145120	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	4.916E-15	1.218E-14	2.042E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.679E-14	2.7E-14	3.357E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145121	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	8.985E-15	1.347E-14	2.042E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.358E-14	2.566E-14	3.357E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145122	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	2.836E-15	1.129E-14	2.009E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.769E-14	2.471E-14	3.304E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145123	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	-2.194E-15	6.17E-15	1.391E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.849E-14	2.028E-14	2.287E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA145124	SLAPS Loadout	10/17/12	Gross Alpha/Beta	Gross Alpha	-6.81E-16	5.699E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.744E-14	1.392E-14	1.927E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145125	SLAPS Loadout	10/18/12	Gross Alpha/Beta	Gross Alpha	5.158E-15	7.732E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.137E-14	1.324E-14	1.927E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145126	SLAPS Loadout	10/18/12	Gross Alpha/Beta	Gross Alpha	-1.849E-15	5.199E-15	1.172E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.34E-15	1.289E-14	1.927E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145127	SLAPS Loadout	10/18/12	Gross Alpha/Beta	Gross Alpha	-3.194E-15	4.919E-15	1.241E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.686E-14	1.456E-14	2.041E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145128	SLAPS Loadout	10/18/12	Gross Alpha/Beta	Gross Alpha	5E-16	6.335E-15	1.206E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.638E-14	1.415E-14	1.982E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145129	SLAPS Loadout	10/24/12	Gross Alpha/Beta	Gross Alpha	1.213E-14	1.009E-14	1.246E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.287E-14	1.965E-14	3.025E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145130	SLAPS Loadout	10/24/12	Gross Alpha/Beta	Gross Alpha	1.94E-16	5.47E-15	1.096E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.98E-15	1.548E-14	2.661E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145131	SLAPS Loadout	10/24/12	Gross Alpha/Beta	Gross Alpha	1.544E-15	6.759E-15	1.246E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.357E-14	1.792E-14	3.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145132	SLAPS Loadout	10/24/12	Gross Alpha/Beta	Gross Alpha	6.768E-15	8.497E-15	1.233E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.093E-14	1.75E-14	2.994E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145133	SLAPS Loadout	10/24/12	Gross Alpha/Beta	Gross Alpha	4.063E-15	7.49E-15	1.208E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.861E-14	1.876E-14	2.933E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145134	SLAPS Loadout	10/22/12	Gross Alpha/Beta	Gross Alpha	5.239E-15	1.326E-14	2.276E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.712E-14	3.201E-14	5.527E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA145135	SLAPS Loadout	10/22/12	Gross Alpha/Beta	Gross Alpha	5.449E-15	1.379E-14	2.367E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.578E-14	3.405E-14	5.748E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145136	SLAPS Loadout	10/22/12	Gross Alpha/Beta	Gross Alpha	7.513E-15	1.385E-14	2.233E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.537E-14	3.404E-14	5.423E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145137	SLAPS Loadout	10/22/12	Gross Alpha/Beta	Gross Alpha	7.374E-15	1.359E-14	2.191E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.601E-14	3.354E-14	5.322E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145138	SLAPS Loadout	10/22/12	Gross Alpha/Beta	Gross Alpha	-4.269E-15	8.736E-15	2.191E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.52E-14	3.519E-14	5.322E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145139	SLAPS Loadout	10/23/12	Gross Alpha/Beta	Gross Alpha	1.789E-15	7.83E-15	1.443E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.106E-15	1.944E-14	3.505E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA145140	SLAPS Loadout	10/23/12	Gross Alpha/Beta	Gross Alpha	7.643E-15	9.597E-15	1.392E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.173E-14	2.063E-14	3.381E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145141	SLAPS Loadout	10/23/12	Gross Alpha/Beta	Gross Alpha	2.4E-16	6.752E-15	1.352E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.202E-14	2.013E-14	3.285E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA145142	SLAPS Loadout	10/23/12	Gross Alpha/Beta	Gross Alpha	3.096E-15	7.836E-15	1.345E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.182E-14	2.175E-14	3.266E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA145143	SLAPS Loadout	10/23/12	Gross Alpha/Beta	Gross Alpha	2.4E-16	6.752E-15	1.352E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.659E-14	2.141E-14	3.285E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150693	SLAPS Loadout	10/29/12	Gross Alpha/Beta	Gross Alpha	1.824E-14	1.032E-14	9.241E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.561E-14	2.216E-14	2.698E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150694	SLAPS Loadout	10/29/12	Gross Alpha/Beta	Gross Alpha	7.055E-15	7.728E-15	9.881E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.921E-14	2.083E-14	2.885E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150695	SLAPS Loadout	10/29/12	Gross Alpha/Beta	Gross Alpha	7.055E-15	7.728E-15	9.881E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.999E-15	1.972E-14	2.885E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150696	SLAPS Loadout	10/29/12	Gross Alpha/Beta	Gross Alpha	5.81E-15	7.315E-15	9.881E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.657E-14	2.211E-14	2.885E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150697	SLAPS Loadout	10/29/12	Gross Alpha/Beta	Gross Alpha	1.204E-14	9.195E-15	9.881E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.71E-14	2.142E-14	2.885E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150698	SLAPS Loadout	11/06/12	Gross Alpha/Beta	Gross Alpha	8.129E-15	9.121E-15	1.323E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.454E-14	1.569E-14	1.993E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150699	SLAPS Loadout	11/06/12	Gross Alpha/Beta	Gross Alpha	-2.253E-15	5.332E-15	1.309E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.563E-14	1.67E-14	1.973E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150700	SLAPS Loadout	11/06/12	Gross Alpha/Beta	Gross Alpha	3.25E-16	6.522E-15	1.323E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.39E-14	1.332E-14	1.993E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150701	SLAPS Loadout	11/06/12	Gross Alpha/Beta	Gross Alpha	2.926E-15	7.488E-15	1.323E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.215E-14	1.432E-14	1.993E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150702	SLAPS Loadout	11/06/12	Gross Alpha/Beta	Gross Alpha	-3.577E-15	4.717E-15	1.323E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.968E-14	1.403E-14	1.993E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150703	SLAPS Loadout	11/07/12	Gross Alpha/Beta	Gross Alpha	-3.651E-15	4.815E-15	1.35E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.936E-14	1.538E-14	2.034E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150704	SLAPS Loadout	11/07/12	Gross Alpha/Beta	Gross Alpha	5.643E-15	8.518E-15	1.35E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.009E-14	1.432E-14	2.034E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150705	SLAPS Loadout	11/07/12	Gross Alpha/Beta	Gross Alpha	5.643E-15	8.518E-15	1.35E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.131E-15	1.296E-14	2.034E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA150706	SLAPS Loadout	11/07/12	Gross Alpha/Beta	Gross Alpha	-9.96E-16	6.106E-15	1.35E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.346E-14	1.471E-14	2.034E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150707	SLAPS Loadout	11/07/12	Gross Alpha/Beta	Gross Alpha	1.593E-15	6.881E-15	1.296E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.848E-14	1.365E-14	1.953E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150708	SLAPS Loadout	11/08/12	Gross Alpha/Beta	Gross Alpha	-3.403E-15	4.488E-15	1.258E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.972E-14	1.459E-14	1.896E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150709	SLAPS Loadout	11/08/12	Gross Alpha/Beta	Gross Alpha	-2.23E-15	5.278E-15	1.296E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.304E-14	1.529E-14	1.953E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150710	SLAPS Loadout	11/08/12	Gross Alpha/Beta	Gross Alpha	-2.145E-15	5.075E-15	1.246E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.41E-14	1.495E-14	1.878E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150711	SLAPS Loadout	11/08/12	Gross Alpha/Beta	Gross Alpha	2.868E-15	7.339E-15	1.296E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.223E-14	1.52E-14	1.953E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150712	SLAPS Loadout	11/08/12	Gross Alpha/Beta	Gross Alpha	2.868E-15	7.339E-15	1.296E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.414E-14	1.431E-14	1.953E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150713	SLAPS Loadout	11/12/12	Gross Alpha/Beta	Gross Alpha	1.69E-15	7.139E-15	1.363E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.333E-14	1.714E-14	2.209E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150714	SLAPS Loadout	11/12/12	Gross Alpha/Beta	Gross Alpha	-2.655E-15	5.079E-15	1.363E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.322E-14	1.601E-14	2.209E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150715	SLAPS Loadout	11/12/12	Gross Alpha/Beta	Gross Alpha	-1.207E-15	5.847E-15	1.363E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.322E-14	1.601E-14	2.209E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150716	SLAPS Loadout	11/12/12	Gross Alpha/Beta	Gross Alpha	3.174E-15	7.794E-15	1.379E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.371E-14	1.734E-14	2.234E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150717	SLAPS Loadout	11/12/12	Gross Alpha/Beta	Gross Alpha	3.211E-15	7.884E-15	1.395E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.693E-14	1.784E-14	2.26E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150718	SLAPS Loadout	11/13/12	Gross Alpha/Beta	Gross Alpha	1.458E-15	6.159E-15	1.176E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.558E-14	1.444E-14	1.906E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150719	SLAPS Loadout	11/13/12	Gross Alpha/Beta	Gross Alpha	8.783E-15	8.521E-15	1.153E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.543E-14	1.721E-14	1.869E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150720	SLAPS Loadout	11/13/12	Gross Alpha/Beta	Gross Alpha	2.19E-16	5.92E-15	1.237E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.94E-14	1.546E-14	2.004E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150721	SLAPS Loadout	11/13/12	Gross Alpha/Beta	Gross Alpha	1.533E-15	6.477E-15	1.237E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.856E-14	1.423E-14	2.004E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150722	SLAPS Loadout	11/13/12	Gross Alpha/Beta	Gross Alpha	5.475E-15	7.918E-15	1.237E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.443E-14	1.798E-14	2.004E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150723	SLAPS Loadout	11/14/12	Gross Alpha/Beta	Gross Alpha	2.24E-16	6.044E-15	1.263E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.043E-14	1.349E-14	2.046E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150724	SLAPS Loadout	11/14/12	Gross Alpha/Beta	Gross Alpha	-3.762E-15	3.826E-15	1.249E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.739E-15	1.236E-14	2.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150725	SLAPS Loadout	11/14/12	Gross Alpha/Beta	Gross Alpha	1.119E-14	9.916E-15	1.29E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.111E-14	1.722E-14	2.09E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150726	SLAPS Loadout	11/14/12	Gross Alpha/Beta	Gross Alpha	1.549E-15	6.544E-15	1.249E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.953E-15	1.292E-14	2.025E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150727	SLAPS Loadout	11/14/12	Gross Alpha/Beta	Gross Alpha	1.582E-15	6.684E-15	1.276E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.411E-14	1.739E-14	2.068E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA150728	SLAPS Loadout	11/27/12	Gross Alpha/Beta	Gross Alpha	-7.22E-16	8.727E-15	1.336E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.322E-14	1.896E-14	1.94E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150729	SLAPS Loadout	11/27/12	Gross Alpha/Beta	Gross Alpha	-3.197E-15	7.995E-15	1.336E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.023E-14	1.596E-14	1.94E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150730	SLAPS Loadout	11/27/12	Gross Alpha/Beta	Gross Alpha	1.753E-15	9.403E-15	1.336E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.123E-14	1.701E-14	1.94E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150731	SLAPS Loadout	11/27/12	Gross Alpha/Beta	Gross Alpha	5.31E-16	9.344E-15	1.376E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.864E-14	1.812E-14	1.998E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150732	SLAPS Loadout	11/27/12	Gross Alpha/Beta	Gross Alpha	5.53E-16	9.733E-15	1.434E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.603E-14	1.849E-14	2.082E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150733	SLAPS Loadout	11/29/12	Gross Alpha/Beta	Gross Alpha	-2.08E-15	8.887E-15	1.419E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.816E-14	1.853E-14	2.06E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150734	SLAPS Loadout	11/29/12	Gross Alpha/Beta	Gross Alpha	1.598E-15	8.571E-15	1.218E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.347E-14	1.597E-14	1.769E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150735	SLAPS Loadout	11/29/12	Gross Alpha/Beta	Gross Alpha	-4.757E-15	8.157E-15	1.434E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.592E-14	1.753E-14	2.082E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150736	SLAPS Loadout	11/29/12	Gross Alpha/Beta	Gross Alpha	-3.43E-15	8.578E-15	1.434E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.339E-14	1.729E-14	2.082E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150737	SLAPS Loadout	11/29/12	Gross Alpha/Beta	Gross Alpha	4.536E-15	1.077E-14	1.434E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.507E-14	1.745E-14	2.082E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150738	SLAPS Loadout	12/05/12	Gross Alpha/Beta	Gross Alpha	4.978E-15	6.963E-15	1.075E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.836E-14	1.709E-14	2.786E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150739	SLAPS Loadout	12/05/12	Gross Alpha/Beta	Gross Alpha	5.028E-15	7.033E-15	1.086E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.974E-14	1.827E-14	2.814E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150740	SLAPS Loadout	12/05/12	Gross Alpha/Beta	Gross Alpha	-1.27E-15	4.261E-15	1.097E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.984E-15	1.611E-14	2.842E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150741	SLAPS Loadout	12/05/12	Gross Alpha/Beta	Gross Alpha	-1.27E-15	4.261E-15	1.097E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.358E-14	1.788E-14	2.842E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150742	SLAPS Loadout	12/05/12	Gross Alpha/Beta	Gross Alpha	-1.27E-15	4.261E-15	1.097E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.953E-14	1.751E-14	2.842E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150743	SLAPS Loadout	12/12/12	Gross Alpha/Beta	Gross Alpha	1.249E-14	1.063E-14	1.264E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.6E-14	2.899E-14	3.618E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150744	SLAPS Loadout	12/12/12	Gross Alpha/Beta	Gross Alpha	4.489E-15	7.895E-15	1.28E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.451E-14	2.698E-14	3.665E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150745	SLAPS Loadout	12/12/12	Gross Alpha/Beta	Gross Alpha	5.967E-15	8.33E-15	1.248E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.01E-14	2.752E-14	3.572E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150746	SLAPS Loadout	12/12/12	Gross Alpha/Beta	Gross Alpha	7.558E-15	8.92E-15	1.248E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.275E-14	2.543E-14	3.572E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150747	SLAPS Loadout	12/12/12	Gross Alpha/Beta	Gross Alpha	-3.98E-16	5.366E-15	1.248E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.326E-14	2.847E-14	3.572E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150748	SLAPS Loadout	12/13/12	Gross Alpha/Beta	Gross Alpha	3.564E-15	6.267E-15	1.016E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.833E-14	2.354E-14	2.909E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150749	SLAPS Loadout	12/13/12	Gross Alpha/Beta	Gross Alpha	5.854E-15	6.909E-15	9.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.968E-14	2.194E-14	2.767E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA150750	SLAPS Loadout	12/13/12	Gross Alpha/Beta	Gross Alpha	8.005E-15	7.452E-15	9.3E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.46E-14	2.012E-14	2.662E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150751	SLAPS Loadout	12/13/12	Gross Alpha/Beta	Gross Alpha	7.086E-15	7.338E-15	9.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	3.811E-14	2.183E-14	2.767E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150752	SLAPS Loadout	12/13/12	Gross Alpha/Beta	Gross Alpha	9.24E-16	4.832E-15	9.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.379E-14	2E-14	2.767E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150753	SLAPS Loadout	12/17/12	Gross Alpha/Beta	Gross Alpha	1.407E-14	9.251E-15	9.389E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.513E-14	2.379E-14	2.688E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150754	SLAPS Loadout	12/17/12	Gross Alpha/Beta	Gross Alpha	1.287E-14	8.931E-15	9.389E-15	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.379E-14	2.238E-14	2.688E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150755	SLAPS Loadout	12/17/12	Gross Alpha/Beta	Gross Alpha	-3.11E-16	4.197E-15	9.761E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.671E-14	2.332E-14	2.794E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150756	SLAPS Loadout	12/17/12	Gross Alpha/Beta	Gross Alpha	5.912E-15	6.977E-15	9.761E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.513E-14	2.321E-14	2.794E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150757	SLAPS Loadout	12/17/12	Gross Alpha/Beta	Gross Alpha	3.423E-15	6.019E-15	9.761E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.751E-14	2.337E-14	2.794E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150758	SLAPS Loadout	12/18/12	Gross Alpha/Beta	Gross Alpha	9.602E-15	1.689E-14	2.738E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.354E-14	6.007E-14	7.839E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150759	SLAPS Loadout	12/18/12	Gross Alpha/Beta	Gross Alpha	2.619E-15	1.369E-14	2.738E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.243E-14	5.924E-14	7.839E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150760	SLAPS Loadout	12/19/12	Gross Alpha/Beta	Gross Alpha	2.619E-15	1.369E-14	2.738E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.169E-13	6.249E-14	7.839E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150761	SLAPS Loadout	12/19/12	Gross Alpha/Beta	Gross Alpha	2.706E-14	2.304E-14	2.738E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	9.688E-14	6.105E-14	7.839E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150762	SLAPS Loadout	12/19/12	Gross Alpha/Beta	Gross Alpha	2.357E-15	1.232E-14	2.465E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.719E-14	5.494E-14	7.055E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150763	SLAPS Loadout	12/24/12	Gross Alpha/Beta	Gross Alpha	4.229E-15	6.901E-15	1.169E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.535E-14	1.489E-14	1.829E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150764	SLAPS Loadout	12/24/12	Gross Alpha/Beta	Gross Alpha	6.745E-15	7.849E-15	1.196E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	8.73E-14	2.058E-14	1.872E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150765	SLAPS Loadout	12/24/12	Gross Alpha/Beta	Gross Alpha	4.288E-15	6.998E-15	1.185E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	4.926E-14	1.733E-14	1.854E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150766	SLAPS Loadout	12/24/12	Gross Alpha/Beta	Gross Alpha	9.118E-15	8.522E-15	1.191E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.254E-14	1.768E-14	1.863E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150767	SLAPS Loadout	12/24/12	Gross Alpha/Beta	Gross Alpha	6.589E-15	7.667E-15	1.169E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.531E-14	1.768E-14	1.829E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA150768	SLAPS Loadout	12/26/12	Gross Alpha/Beta	Gross Alpha	-1.72E-15	4.572E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	7.577E-15	1.332E-14	1.881E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150769	SLAPS Loadout	12/26/12	Gross Alpha/Beta	Gross Alpha	6.777E-15	7.886E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.76E-14	1.443E-14	1.881E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150770	SLAPS Loadout	12/26/12	Gross Alpha/Beta	Gross Alpha	-5.06E-16	5.176E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	6.036E-15	1.314E-14	1.881E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150771	SLAPS Loadout	12/26/12	Gross Alpha/Beta	Gross Alpha	4.35E-15	7.098E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.837E-14	1.451E-14	1.881E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA150772	SLAPS Loadout	12/27/12	Gross Alpha/Beta	Gross Alpha	7.29E-16	5.886E-15	1.237E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.177E-14	1.416E-14	1.936E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA150773	SLAPS Loadout	12/27/12	Gross Alpha/Beta	Gross Alpha	5.564E-15	7.503E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.607E-14	1.532E-14	1.881E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150774	SLAPS Loadout	12/27/12	Gross Alpha/Beta	Gross Alpha	-5.06E-16	5.176E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.682E-14	1.435E-14	1.881E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA150775	SLAPS Loadout	12/27/12	Gross Alpha/Beta	Gross Alpha	1.447E-14	1.017E-14	1.237E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.446E-14	1.552E-14	1.936E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA150776	SLAPS Loadout	12/27/12	Gross Alpha/Beta	Gross Alpha	1.922E-15	6.212E-15	1.202E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.838E-14	1.555E-14	1.881E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143905	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	8.63E-15	7.687E-15	1.028E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.593E-14	1.707E-14	1.744E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143906	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	8.153E-15	7.99E-15	1.119E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.435E-14	1.511E-14	1.898E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143907	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	3.168E-15	6.205E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.096E-14	1.463E-14	1.88E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143908	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	5.594E-15	7.075E-15	1.103E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.008E-14	1.447E-14	1.87E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143909	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	7.05E-16	5.07E-15	1.092E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.144E-14	1.45E-14	1.853E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143910	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	1.141E-15	5.288E-15	9.523E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.717E-14	1.7E-14	2.709E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air

Table B-2. SLAPS Perimeter Air Data Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143905	SLAPS Loadout	07/24/12	Gross Alpha/Beta	Gross Alpha	8.63E-15	7.687E-15	1.028E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	5.593E-14	1.707E-14	1.744E-14	µCi/mL	=		SLAPS (General Area)-Perimeter Air
SLA143906	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	8.153E-15	7.99E-15	1.119E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.435E-14	1.511E-14	1.898E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143907	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	3.168E-15	6.205E-15	1.108E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.096E-14	1.463E-14	1.88E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143908	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	5.594E-15	7.075E-15	1.103E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.008E-14	1.447E-14	1.87E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143909	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	7.05E-16	5.07E-15	1.092E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	2.144E-14	1.45E-14	1.853E-14	µCi/mL	J	T04	SLAPS (General Area)-Perimeter Air
SLA143910	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	1.141E-15	5.288E-15	9.523E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.717E-14	1.7E-14	2.709E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143911	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	2.363E-15	5.787E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.691E-14	2.683E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
SLA143912	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	8.527E-15	7.994E-15	9.429E-15	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.153E-14	1.632E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143913	SLAPS Loadout	07/25/12	Gross Alpha/Beta	Gross Alpha	1.13E-15	5.236E-15	9.429E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.465E-14	1.662E-14	2.683E-14	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
SLA143914	SLAPS Loadout	07/26/12	Gross Alpha/Beta	Gross Alpha	3.304E-15	5.781E-15	8.665E-15	µCi/mL	UJ	T06	SLAPS (General Area)-Perimeter Air
				Gross Beta	1.778E-14	1.567E-14	2.465E-14	µCi/mL	U	T04, T05	SLAPS (General Area)-Perimeter Air

Table B-3. NC Sites External Gamma Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
HIS141631	BA-1	03/26/12	Radiological	External gamma radiation	19.3	0	0.1	mrem	J	Y01	HISS Air (TLDs)-Environmental Monitoring
HIS141632	BA-1	07/05/12	Radiological	External gamma radiation	27.4	0	0.1	mrem	J	Y01	HISS Air (TLDs)-Environmental Monitoring
HIS141633	BA-1	10/01/12	Radiological	External gamma radiation	28.3	0	0.1	mrem	J	Y01	HISS Air (TLDs)-Environmental Monitoring
HIS151664	BA-1	01/07/13	Radiological	External gamma radiation	19.4	0	0.1	mrem	J	Y01	HISS Air (TLDs)-Environmental Monitoring
SLA141604	PA-1	03/26/12	Radiological	External gamma radiation	17.5	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141605	PA-2	03/26/12	Radiological	External gamma radiation	21.3	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141605-1	PA-2dup	03/26/12	Radiological	External gamma radiation	17.8	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141606	PA-3	03/26/12	Radiological	External gamma radiation	17.1	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141607	PA-4	03/26/12	Radiological	External gamma radiation	18.1	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141608	PA-1	07/05/12	Radiological	External gamma radiation	27.2	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141609	PA-2	07/05/12	Radiological	External gamma radiation	28.2	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141610	PA-3	07/05/12	Radiological	External gamma radiation	26.3	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141611	PA-4	07/05/12	Radiological	External gamma radiation	28.6	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141611-1	PA-2dup	07/05/12	Radiological	External gamma radiation	27.8	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141612	PA-1	10/01/12	Radiological	External gamma radiation	29.7	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141613	PA-2	10/01/12	Radiological	External gamma radiation	27.3	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141613-1	PA-2 dup	10/01/12	Radiological	External gamma radiation	29.8	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141614	PA-3	10/01/12	Radiological	External gamma radiation	29.1	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA141615	PA-4	10/01/12	Radiological	External gamma radiation	30.2	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA151648	PA-1	01/07/13	Radiological	External gamma radiation	20.9	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA151649	PA-2	01/07/13	Radiological	External gamma radiation	21.8	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA151649-1	PA-2 dup	01/07/13	Radiological	External gamma radiation	22.2	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA151650	PA-3	01/07/13	Radiological	External gamma radiation	20.3	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring
SLA151651	PA-4	01/07/13	Radiological	External gamma radiation	20.9	0	0.1	mrem	J	Y01	SLAPS Air (TLDs)-Environmental Monitoring

Table B-4. NC Sites Radon-222 Results for CY 2012

Sample Name	Station Name	Sample Collection Date	Method Type	Analyte Name	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code	Sampling Event Name
HIS141549	BA-1	07/05/12	Radiological	Radon-222	0.7	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS151606	BA-1	01/07/13	Radiological	Radon-222	0.2	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS141560	HF-1	07/09/12	Radiological	Radon-222	1.9	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141561	HF-2	07/09/12	Radiological	Radon-222	3.9	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141562	HF-3	07/09/12	Radiological	Radon-222	0.7	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141564	HF-5	07/09/12	Radiological	Radon-222	0.9	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141565	HF-6	07/09/12	Radiological	Radon-222	0.7	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141566	HF-7	07/09/12	Radiological	Radon-222	1.2	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141567	HF-8	07/09/12	Radiological	Radon-222	0.5	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS141569	HF-10	07/09/12	Radiological	Radon-222	0.7	0	0.2	pCi/L	J	Y01	HISS Air (Alpha Tracks)-Environmental Monitoring
HIS151607	HF-1	01/07/13	Radiological	Radon-222	1.9	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151608	HF-2	01/07/13	Radiological	Radon-222	4.2	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151609	HF-3	01/07/13	Radiological	Radon-222	0.4	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151610	HF-4	01/07/13	Radiological	Radon-222	0.6	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151611	HF-5	01/07/13	Radiological	Radon-222	1	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151612	HF-6	01/07/13	Radiological	Radon-222	0.7	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151613	HF-7	01/07/13	Radiological	Radon-222	1.3	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151614	HF-8	01/07/13	Radiological	Radon-222	0.4	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151615	HF-9	01/07/13	Radiological	Radon-222	0.5	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
HIS151616	HF-10	01/07/13	Radiological	Radon-222	0.6	0	0.2	pCi/L	J	Y01	HISS/Futura (Alpha Tracks)-Environmental Monitoring
SLA141596	PA-1	07/05/12	Radiological	Radon-222	0.3	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA141597	PA-2	07/05/12	Radiological	Radon-222	0.8	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA141598	PA-3	07/05/12	Radiological	Radon-222	0.3	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA151640	PA-1	01/07/13	Radiological	Radon-222	0.2	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA151641	PA-2	01/07/13	Radiological	Radon-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA151641-1	PA-2 dup	01/07/13	Radiological	Radon-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA151642	PA-3	01/07/13	Radiological	Radon-222	0.2	0	0.2	pCi/L	UJ	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring
SLA151643	PA-4	01/07/13	Radiological	Radon-222	0.5	0	0.2	pCi/L	J	Y01	SLAPS Air (Alpha Tracks)-Environmental Monitoring

APPENDIX C

STORM-WATER, WASTE-WATER AND EXCAVATION-WATER DATA

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Table C-1. NPDES Analytical Data for 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code
SVP138948	IA-09 Ballfields	01/26/12	EPA 160.5	SS	0.1		0.1	mL/L/hr	=	
SVP138948	IA-09 Ballfields	01/26/12	ML-024	pH	7.83		0.1	No Units	=	
SVP138948	IA-09 Ballfields	01/26/12	ML-005	Thorium-228	0.773	0.444	0.161	pCi/L	J	T04
SVP138948	IA-09 Ballfields	01/26/12	ML-005	Thorium-230	1.91	0.73	0.161	pCi/L	J	F01
SVP138948	IA-09 Ballfields	01/26/12	ML-005	Thorium-232	0.208	0.247	0.356	pCi/L	UJ	T06
SVP138948	IA-09 Ballfields	01/26/12	ML-006	Radium-226	0.626	0.886	1.54	pCi/L	UJ	T06
SVP138948	IA-09 Ballfields	01/26/12	ML-018	Gross Alpha	0	4.98	9.02	pCi/L	UJ	T06
SVP138948	IA-09 Ballfields	01/26/12	ML-018	Gross Beta	9.4	7.28	11.7	pCi/L	U	T04, T05
SVP138948	IA-09 Ballfields	01/26/12	ML-003	Actinium-227	3.79	5.03	3.98	pCi/L	UJ	T04, T06
SVP138948	IA-09 Ballfields	01/26/12	ML-003	Protactinium-231	-0.519	19.8	19	pCi/L	UJ	T04, T06
SVP138948	IA-09 Ballfields	01/26/12	ML-021	Total Uranium	0.517	0.0472	2.5	pCi/L	U	T04, T05
SVP138949	IA-09 Ballfields	01/31/12	EPA 160.5	SS	0		0.1	mL/L/hr	U	
SVP138949	IA-09 Ballfields	01/31/12	ML-024	pH	7.49		0.1	No Units	=	
SVP138949	IA-09 Ballfields	01/31/12	ML-005	Thorium-228	0.263	0.311	0.484	pCi/L	UJ	T06
SVP138949	IA-09 Ballfields	01/31/12	ML-005	Thorium-230	1.05	0.573	0.485	pCi/L	J	F01, T04
SVP138949	IA-09 Ballfields	01/31/12	ML-005	Thorium-232	0.0657	0.132	0.178	pCi/L	UJ	T06
SVP138949	IA-09 Ballfields	01/31/12	ML-006	Radium-226	0.38	0.539	0.516	pCi/L	UJ	T06
SVP138949	IA-09 Ballfields	01/31/12	ML-018	Gross Alpha	0.307	5.02	9.02	pCi/L	UJ	T06
SVP138949	IA-09 Ballfields	01/31/12	ML-018	Gross Beta	1.71	6.89	11.7	pCi/L	UJ	T06
SVP138949	IA-09 Ballfields	01/31/12	ML-003	Actinium-227	1.09	7.09	5.97	pCi/L	UJ	T04, T06
SVP138949	IA-09 Ballfields	01/31/12	ML-003	Protactinium-231	-4.58	29.4	24.5	pCi/L	UJ	T04, T06
SVP138949	IA-09 Ballfields	01/31/12	ML-021	Total Uranium	0.732	0.0667	2.5	pCi/L	U	T04, T05
SVP138949	IA-09 Ballfields	01/31/12	EPA 200.7	Arsenic	15		15	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	EPA 200.7	Cadmium	2		2	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	EPA 200.7	Chromium	6.9		2	µg/L	J	Y01
SVP138949	IA-09 Ballfields	01/31/12	EPA 150.1	pH	8.1		0.1	No Units	J	Y01
SVP138949	IA-09 Ballfields	01/31/12	EPA 160.5	SS	0.1		0.1	mL/L/hr	U	
SVP138949	IA-09 Ballfields	01/31/12	EPA 1664	TRPH	5		5	mg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	EPA 413.1	Oil and Grease	5		5	mg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1016	0.5		0.5	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1221	0.5		0.5	µg/L	UJ	Y01

Table C-1. NPDES Analytical Data for 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1232	0.5		0.5	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1242	0.5		0.5	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1248	0.5		0.5	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1254	0.5		0.5	µg/L	UJ	Y01
SVP138949	IA-09 Ballfields	01/31/12	SW846 8082	Aroclor-1260	0.5		0.5	µg/L	UJ	Y01
SVP138950	IA-09 Ballfields	04/16/12	EPA 160.5	SS	0.4		0.1	mL/L/hr	=	
SVP138950	IA-09 Ballfields	04/16/12	ML-024	pH	7.9		0.1	No Units	=	
SVP138950	IA-09 Ballfields	04/16/12	ML-005	Thorium-228	1.21	0.57	0.164	pCi/L	=	
SVP138950	IA-09 Ballfields	04/16/12	ML-005	Thorium-230	1.94	0.743	0.164	pCi/L	J	F01
SVP138950	IA-09 Ballfields	04/16/12	ML-005	Thorium-232	0.726	0.432	0.164	pCi/L	J	T04
SVP138950	IA-09 Ballfields	04/16/12	ML-006	Radium-226	0.216	0.682	1.59	pCi/L	UJ	T06
SVP138950	IA-09 Ballfields	04/16/12	ML-018	Gross Alpha	-7.66	19.6	38.3	pCi/L	UJ	T06
SVP138950	IA-09 Ballfields	04/16/12	ML-018	Gross Beta	8.55	29.2	49.6	pCi/L	UJ	T06
SVP138950	IA-09 Ballfields	04/16/12	ML-003	Actinium-227	-2.13	5.11	4.68	pCi/L	UJ	T04, T06
SVP138950	IA-09 Ballfields	04/16/12	ML-003	Protactinium-231	-12.2	21.2	19.8	pCi/L	UJ	T04, T06
SVP138950	IA-09 Ballfields	04/16/12	ML-021	Total Uranium	0.817	0.0745	2.5	pCi/L	U	T04, T05
SVP138951	IA-09 Ballfields	04/29/12	EPA 160.5	SS	0.6		0.1	mL/L/hr	=	
SVP138951	IA-09 Ballfields	04/29/12	ML-005	Thorium-228	1.25	0.587	0.169	pCi/L	J	F01
SVP138951	IA-09 Ballfields	04/29/12	ML-005	Thorium-230	2.24	0.833	0.459	pCi/L	J	F01
SVP138951	IA-09 Ballfields	04/29/12	ML-005	Thorium-232	1.12	0.554	0.169	pCi/L	=	
SVP138951	IA-09 Ballfields	04/29/12	ML-006	Radium-226	2.93	1.65	1.3	pCi/L	J	T04
SVP138951	IA-09 Ballfields	04/29/12	ML-018	Gross Alpha	1.84	10.5	18.5	pCi/L	UJ	T06
SVP138951	IA-09 Ballfields	04/29/12	ML-018	Gross Beta	12.7	15.8	25.9	pCi/L	UJ	T06
SVP138951	IA-09 Ballfields	04/29/12	ML-003	Actinium-227	-4.25	7.31	5.88	pCi/L	UJ	T04, T06
SVP138951	IA-09 Ballfields	04/29/12	ML-003	Protactinium-231	-7.81	25.7	26.5	pCi/L	UJ	T04, T06
SVP138951	IA-09 Ballfields	04/29/12	ML-021	Total Uranium	0.189	0.0173	2.5	pCi/L	U	T04, T05
SVP138952	VP-16	12/20/12	EPA 160.5	SS	0.2		0.1	mL/L/hr	=	
SVP138952	VP-16	12/20/12	ML-024	pH	8.06		0.1	No Units	=	
SVP138952	VP-16	12/20/12	ML-005	Thorium-228	0.752	0.449	0.361	pCi/L	J	F01, T04
SVP138952	VP-16	12/20/12	ML-005	Thorium-230	0.421	0.323	0.163	pCi/L	J	F01, T04
SVP138952	VP-16	12/20/12	ML-005	Thorium-232	0.24	0.243	0.163	pCi/L	UJ	T02

Table C-1. NPDES Analytical Data for 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Measurement Error	Detection Limit	Units	VQ	Validation Reason Code
SVP138952	VP-16	12/20/12	ML-006	Radium-226	0.337	0.673	1.35	pCi/L	UJ	T06
SVP138952	VP-16	12/20/12	ML-018	Gross Alpha	3.24	4.82	8.05	pCi/L	UJ	T06
SVP138952	VP-16	12/20/12	ML-018	Gross Beta	17.2	7.37	11.2	pCi/L	J	F01, J01
SVP138952	VP-16	12/20/12	ML-003	Actinium-227	-3.28	5.46	4.31	pCi/L	UJ	T04, T06
SVP138952	VP-16	12/20/12	ML-003	Protactinium-231	9.11	22.2	20.1	pCi/L	UJ	T04, T06
SVP138952	VP-16	12/20/12	ML-021	Total Uranium	1.11	0.102	2.5	pCi/L	U	T04, T05

Table C-2. North St. Louis County Sites Rainfall Data for CY 2012

First Quarter CY 2012 Data

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Jan	0.05		
2-Jan	trace		
3-Jan			
4-Jan			
5-Jan			
6-Jan			
7-Jan			
8-Jan			
9-Jan			
10-Jan			
11-Jan			
12-Jan	0.05		
13-Jan	trace		
14-Jan			
15-Jan			
16-Jan			
17-Jan	0.62		
18-Jan			
19-Jan			
20-Jan	trace		
21-Jan			
22-Jan			
23-Jan	0.01		
24-Jan			
25-Jan	0.63		
26-Jan	0.34		0.161
27-Jan	0.14		
28-Jan	0.06		
29-Jan			
30-Jan			
31-Jan	trace		0.016
Total (inches)	**1.90**		
Monthly Average			**0.006**

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Feb			
2-Feb			
3-Feb	1.05		
4-Feb	0.23		
5-Feb	0.04		
6-Feb			
7-Feb	0.09		
8-Feb	0.04		
9-Feb			
10-Feb	0.04		
11-Feb	0.01		
12-Feb			
13-Feb	0.13		
14-Feb	trace		
15-Feb	0.16		
16-Feb	0.14		
17-Feb			
18-Feb			
19-Feb			
20-Feb	0.03		
21-Feb	0.02		
22-Feb			
23-Feb	0.03		
24-Feb	trace		
25-Feb	trace		
26-Feb			
27-Feb			
28-Feb	trace		
29-Feb	0.02		
Total (inches)	**2.03**		
Monthly Average			

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Mar			
2-Mar	0.20		
3-Mar			
4-Mar	trace		
5-Mar			
6-Mar			
7-Mar	0.01		
8-Mar	0.20		
9-Mar			
10-Mar			
11-Mar	0.19		
12-Mar	trace		
13-Mar			
14-Mar	trace		
15-Mar	0.74		
16-Mar	0.22		
17-Mar	1.34		
18-Mar	0.01		
19-Mar			
20-Mar			
21-Mar	trace		
22-Mar	0.19		
23-Mar	0.13		
24-Mar	trace		
25-Mar			
26-Mar			
27-Mar			
28-Mar			
29-Mar	0.10		
30-Mar			
31-Mar			
Total (inches)	**3.33**		
Monthly Average			

Notes:

Flow measurements for the outfalls are reported in MGD and reported to three significant digits. All blank spaces represent zero flow.

Rainfall data is obtained from the National Weather Service Station at Lambert - St. Louis International Airport.

[a] Outfall 002 is sampled annually per MDNR letter dated 02/19/02, as a result flow is not measured until a sample is collected.

[b] Un-named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

Table C-2. North St. Louis County Sites Rainfall Data for CY 2012

Second Quarter CY 2012 Data

Date	(inches)	Outfall	Outfall Ballfields
2012	24-hour total	002[a]	Un-Named[b]
1-Apr			
2-Apr			
3-Apr	0.72		
4-Apr	0.31		
5-Apr	0.72		
6-Apr			
7-Apr	trace		
8-Apr			
9-Apr			
10-Apr			
11-Apr			
12-Apr			
13-Apr	1.12		
14-Apr	1.30		
15-Apr	0.92		
16-Apr			0.437
17-Apr			
18-Apr			
19-Apr			
20-Apr	0.10		
21-Apr	trace		
22-Apr	0.14		
23-Apr			
24-Apr			
25-Apr	trace		
26-Apr			
27-Apr	trace		
28-Apr	1.40		
29-Apr	0.52		0.247
30-Apr	0.05		
Total (inches)	7.30		
Monthly Average			0.023

Date	(inches)	Outfall	Outfall Ballfields
2012	24-hour total	002[a]	Un-Named[b]
1-May	0.57		
2-May			
3-May			
4-May	0.10		
5-May			
6-May	0.01		
7-May	0.82		
8-May			
9-May			
10-May			
11-May			
12-May			
13-May			
14-May			
15-May			
16-May			
17-May			
18-May			
19-May			
20-May	0.10		
21-May			
22-May			
23-May			
24-May			
25-May			
26-May			
27-May			
28-May	trace		
29-May	trace		
30-May	trace		
31-May	0.10		
Total (inches)	1.70		
Monthly Average			

Date	(inches)	Outfall	Outfall Ballfields
2012	24-hour total	002[a]	Un-Named[b]
1-Jun	trace		
2-Jun	trace		
3-Jun			
4-Jun	0.04		
5-Jun			
6-Jun			
7-Jun			
8-Jun			
9-Jun			
10-Jun			
11-Jun	1.06		
12-Jun			
13-Jun			
14-Jun			
15-Jun			
16-Jun	0.87		
17-Jun	trace		
18-Jun			
19-Jun			
20-Jun			
21-Jun			
22-Jun			
23-Jun			
24-Jun			
25-Jun			
26-Jun			
27-Jun			
28-Jun			
29-Jun			
30-Jun			
Total (inches)	1.97		
Monthly Average			

Notes:

Flow measurements for the outfalls are reported in MGD and reported to three significant digits. All blank spaces represent zero flow.

Rainfall data is obtained from the National Weather Service Station at Lambert - St. Louis International Airport.

[a] Outfall 002 is sampled annually per MDNR letter dated 02/19/02, as a result flow is not measured until a sample is collected.

[b] Un-named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

Table C-2. North St. Louis County Sites Rainfall Data for CY 2012

Third Quarter CY 2012 Data

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Jul			
2-Jul	trace		
3-Jul			
4-Jul			
5-Jul			
6-Jul			
7-Jul	0.01		
8-Jul	0.24		
9-Jul	0.03		
10-Jul			
11-Jul			
12-Jul			
13-Jul			
14-Jul	0.25		
15-Jul			
16-Jul			
17-Jul			
18-Jul	trace		
19-Jul			
20-Jul			
21-Jul			
22-Jul			
23-Jul			
24-Jul			
25-Jul			
26-Jul	trace		
27-Jul			
28-Jul			
29-Jul	0.19		
30-Jul	trace		
31-Jul			
Total (inches)	**0.72**		
Monthly Average			

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Aug			
2-Aug	0.01		
3-Aug			
4-Aug	0.48		
5-Aug	trace		
6-Aug			
7-Aug			
8-Aug	0.46		
9-Aug	0.01		
10-Aug			
11-Aug			
12-Aug	0.03		
13-Aug	0.12		
14-Aug			
15-Aug			
16-Aug	0.51		
17-Aug			
18-Aug			
19-Aug	trace		
20-Aug			
21-Aug	trace		
22-Aug			
23-Aug			
24-Aug			
25-Aug	0.07		
26-Aug	0.83		
27-Aug	0.02		
28-Aug			
29-Aug			
30-Aug			
31-Aug	1.48		
Total (inches)	**4.02**		
Monthly Average			

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Sep	0.57		
2-Sep	0.11		
3-Sep	trace		
4-Sep	0.01		
5-Sep	0.13		
6-Sep			
7-Sep	0.57		
8-Sep			
9-Sep			
10-Sep			
11-Sep			
12-Sep			
13-Sep			
14-Sep	0.10		
15-Sep			
16-Sep			
17-Sep	0.29		
18-Sep	0.01		
19-Sep	0.00		
20-Sep	trace		
21-Sep			
22-Sep			
23-Sep			
24-Sep			
25-Sep	0.97		
26-Sep	0.19		
27-Sep			
28-Sep	0.08		
29-Sep			
30-Sep			
Total (inches)	**3.03**		
Monthly Average			

Notes:

Flow measurements for the outfalls are reported in MGD and reported to three significant digits. All blank spaces represent zero flow.

Rainfall data is obtained from the National Weather Service Station at Lambert - St. Louis International Airport.

[a] Outfall 002 is sampled annually per MDNR letter dated 02/19/02, as a result flow is not measured until a sample is collected.

[b] Un-named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

Table C-2. North St. Louis County Sites Rainfall Data for CY 2012

Fourth Quarter CY 2012 Data

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Oct			
2-Oct	trace		
3-Oct	trace		
4-Oct			
5-Oct	0.54		
6-Oct			
7-Oct			
8-Oct			
9-Oct	0.01		
10-Oct	0.01		
11-Oct	trace		
12-Oct			
13-Oct	0.12		
14-Oct	0.77		
15-Oct			
16-Oct			
17-Oct	0.27		
18-Oct	trace		
19-Oct	0.01		
20-Oct			
21-Oct			
22-Oct	0.08		
23-Oct	0.25		
24-Oct			
25-Oct	0.44		
26-Oct			
27-Oct			
28-Oct			
29-Oct			
30-Oct			
31-Oct			
Total (inches)	**2.50**		
Monthly Average			

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]
1-Nov			
2-Nov			
3-Nov			
4-Nov			
5-Nov	0.08		
6-Nov	0.02		
7-Nov	trace		
8-Nov			
9-Nov			
10-Nov	trace		
11-Nov	1.20		
12-Nov			
13-Nov			
14-Nov			
15-Nov			
16-Nov			
17-Nov			
18-Nov			
19-Nov	0.01		
20-Nov			
21-Nov			
22-Nov	0.09		
23-Nov			
24-Nov			
25-Nov			
26-Nov			
27-Nov			
28-Nov			
29-Nov			
30-Nov			
Total (inches)	**1.40**		
Monthly Average			

Date 2012	(inches) 24-hour total	Outfall 002[a]	Outfall Ballfields Un-Named[b]	Outfall Eva Loadout Un-Named[b]
1-Dec				
2-Dec	0.03			
3-Dec				
4-Dec	0.30			
5-Dec				
6-Dec				
7-Dec	0.05			
8-Dec	0.24			
9-Dec	0.26			
10-Dec				
11-Dec				
12-Dec				
13-Dec				
14-Dec	0.04			
15-Dec	0.35			
16-Dec				
17-Dec	0.07			
18-Dec				
19-Dec	0.07			
20-Dec	0.31			0.147
21-Dec				
22-Dec				
23-Dec				
24-Dec				
25-Dec				
26-Dec	trace			
27-Dec				
28-Dec	0.06			
29-Dec	trace			
30-Dec				
31-Dec	0.22			
Total (inches)	**2.00**			
Monthly Average				**0.005**

Notes:

Flow measurements for the outfalls are reported in MGD and reported to three significant digits. All blank spaces represent zero flow.

Rainfall data is obtained from the National Weather Service Station at Lambert - St. Louis International Airport.

[a] Outfall 002 is sampled annually per MDNR letter dated 02/19/02, as a result flow is not measured until a sample is collected.

[b] Un-named moving outfall is an outfall sampled during pumping activities or from a rain event producing a measurable flow offsite.

Table C-3. First Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2012

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-273	01/03/12 - 01/05/12 (HISS/Futura Latty VP)	<11	pCi/L	158,580	3.2E-06	3,000	pCi/L	0.01
Gross Beta			<11	pCi/L		3.4E-06	N/A		
Th-228			<0.6	pCi/L		1.8E-07	2,000	pCi/L	
Th-230			1	pCi/L		6.0E-07	1,000	pCi/L	
Uranium (KPA)			9	pCi/L		5.2E-06	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		6.2E-07	10	pCi/L	
Ra-228[d,e]			<0.6	pCi/L		1.8E-07	30	pCi/L	
Barium			0.048	mg/L		-	10	mg/L	
Lead			<0.01	mg/L		-	0.4	mg/L	
Selenium[f]			<0.01	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			<11	pCi/L		-	-		
TSS			41	mg/L		-	-		
Gross Alpha (raw water)	SLAPS-274	01/10/12 (Ballfields SLAPS VP)	38	pCi/L	28,524	4.1E-06	3,000	pCi/L	0.02
Gross Beta			7	pCi/L		7.3E-07	N/A		
Th-228			<0.4	pCi/L		2.3E-08	2,000	pCi/L	
Th-230			4	pCi/L		4.2E-07	1,000	pCi/L	
Uranium (KPA)			55	pCi/L		6.0E-06	3,000	pCi/L	
Ra-226[c]			<1	pCi/L		6.5E-08	10	pCi/L	
Ra-228[d,e]			<0.4	pCi/L		2.3E-08	30	pCi/L	
Barium			0.085	mg/L		-	10	mg/L	
Lead			0.003	mg/L		-	0.4	mg/L	
Selenium[f]			0.00	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			22	pCi/L		-	-		
TSS			81	mg/L		-	-		
Gross Alpha (raw water)	SLAPS-275	01/26/11 - 01/30/12 (Ballfields SLAPS VP)	42	pCi/L	79,136	1.2E-05	3,000	pCi/L	0.03
Gross Beta			25	pCi/L		7.5E-06	N/A		
Th-228			<0.6	pCi/L		8.7E-08	2,000	pCi/L	
Th-230			13	pCi/L		3.9E-06	1,000	pCi/L	
Uranium (KPA)			56	pCi/L		1.7E-05	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		2.3E-07	10	pCi/L	
Ra-228[d,e]			<0.6	pCi/L		8.7E-08	30	pCi/L	
Barium			0.070	mg/L		-	10	mg/L	
Lead			0.001	mg/L		-	0.4	mg/L	
Selenium[f]			0.00	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			42	pCi/L		-	-		
TSS			24	mg/L		-	-		

Total Activity Discharged in 1st Quarter of CY 2012 (Ci)

Th-228	2.9E-07
Th-230	4.9E-06
U (KPA)	2.8E-05
Ra-226	9.1E-07
Ra-228[b]	2.9E-07

Total Activity Discharged through 03/31/12 (Ci)

Th-228	2.9E-07
Th-230	4.9E-06
U (KPA)	2.8E-05
Ra-226	9.1E-07
Ra-228[b]	2.9E-07

Total Volume for 1st Quarter of CY 2012 (gallons)

Gallons 266,240

Total Volume Discharged through 03/31/12 (gallons)

Gallons 266,240

NOTES:

[a] Non-detect sample results are converted to half the detection limit for total activity.

[b] The weighted average was used to calculate the total activity.

[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.

[d] Ra-228 assumed to be in equilibrium with Th-228.

[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.

[f] The limit for selenium can be a daily total mass of 76 grams, with a concentration not to exceed 0.90 mg/L.

[g] MSD surcharges apply for BOD concentration > 300 mg/L and COD concentration > 600 mg/L.

TSS – total suspended solid(s)

mg/L – milligram(s) per liter

N/A – Not applicable

SOR – sum of ratios

pCi/L – picocurie(s) per liter

Ci – curie(s)

- No data/No limit

Table C-3. Second Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2012

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-276	04/16/12 - 04/24/12 (Ballfields SLAPS VP)	11	pCi/L	387,599	1.6E-05	3,000	pCi/L	0.01
Gross Beta			<11	pCi/L		7.8E-06	N/A		
Th-228			<1	pCi/L		9.8E-07	2,000	pCi/L	
Th-230			2	pCi/L		2.9E-06	1,000	pCi/L	
Uranium (KPA)			12	pCi/L		1.8E-05	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		1.5E-06	10	pCi/L	
Ra-228[d,e]			<1	pCi/L		9.8E-07	30	pCi/L	
Barium			0.100	mg/L		-	10	mg/L	
Lead			<0.01	mg/L		-	0.4	mg/L	
Selenium[f]			<0.01	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			9	pCi/L		-	-		
TSS			42	mg/L		-	-		
Gross Alpha (raw water)	SLAPS-277	04/25/12 - 04/26/12 (Ballfields SLAPS VP)	<9	pCi/L	78,039	1.3E-06	3,000	pCi/L	0.01
Gross Beta			11	pCi/L		3.2E-06	N/A		
Th-228			0.3	pCi/L		7.4E-08	2,000	pCi/L	
Th-230			2	pCi/L		5.9E-07	1,000	pCi/L	
Uranium (KPA)			6	pCi/L		1.8E-06	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		3.0E-07	10	pCi/L	
Ra-228[d,e]			0.3	pCi/L		7.4E-08	30	pCi/L	
Barium			0.130	mg/L		-	10	mg/L	
Lead			<0.01	mg/L		-	0.4	mg/L	
Selenium[f]			<0.01	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			<9	pCi/L		-	-		
TSS			74	mg/L		-	-		
Gross Alpha (raw water)	SLAPS-278	04/26/12 - 04/30/12 (Ballfields SLAPS VP)	16	pCi/L	125,860	7.7E-06	3,000	pCi/L	0.01
Gross Beta			21	pCi/L		1.0E-05	N/A		
Th-228			<1	pCi/L		1.8E-07	2,000	pCi/L	
Th-230			3	pCi/L		1.4E-06	1,000	pCi/L	
Uranium (KPA)			10	pCi/L		4.8E-06	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		5.1E-07	10	pCi/L	
Ra-228[d,e]			<1	pCi/L		1.8E-07	30	pCi/L	
Barium			0.060	mg/L		-	10	mg/L	
Lead			<0.01	mg/L		-	0.4	mg/L	
Selenium[f]			<0.01	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			<9	pCi/L		-	-		
TSS			22	mg/L		-	-		

Total Activity Discharged in 2nd Quarter of CY 2012 (Ci)

Th-228	1.2E-06
Th-230	5.0E-06
U (KPA)	2.4E-05
Ra-226	2.3E-06
Ra-228[b]	1.2E-06

Total Activity Discharged through 06/30/12 (Ci)

Th-228	1.5E-06
Th-230	9.9E-06
U (KPA)	5.2E-05
Ra-226	3.2E-06
Ra-228[b]	1.5E-06

Total Volume for 2nd Quarter of CY 2012 (gallons)

Gallons 591,498

Total Volume Discharged through 06/30/12 (gallons)

Gallons 857,738

NOTES:

[a] Non-detect sample results are converted to half the detection limit for total activity.

[b] The weighted average was used to calculate the total activity.

[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.

[d] Ra-228 assumed to be in equilibrium with Th-228.

[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.

[f] The limit for selenium can be a daily total mass of 76 grams, with a concentration not to exceed 0.90 mg/L.

[g] MSD surcharges apply for BOD concentration > 300 mg/L and COD concentration > 600 mg/L.

TSS – total suspended solid(s)

mg/L – milligram(s) per liter

N/A – Not applicable

SOR – sum of ratios

pCi/L – picocurie(s) per liter

Ci – curie(s)

- No data/No limit

Table C-3. Third Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2012

Parameter	Batch Number	Date of Discharge	Batch Results	Amount Discharged (Gallons)	Total Activity per Discharge (Ci)	MSD Discharge Limit	SOR

During the third quarter there was no discharge of wastewater to the MSD from the SLAPS, SLAPS VPs, or Latty Avenue VPs.

Total Activity Discharged in 3rd Quarter of CY 2012 (Ci)		Total Activity Discharged through 09/30/12 (Ci)	
Th-228	0.0E+00	**Th-228**	1.5E-06
Th-230	0.0E+00	**Th-230**	9.9E-06
U (KPA)	0.0E+00	**U (KPA)**	5.2E-05
Ra-226	0.0E+00	**Ra-226**	3.2E-06
Ra-228[b]	0.0E+00	**Ra-228**[b]	1.5E-06

Total Volume for 3rd Quarter of CY 2012 (gallons)		Total Volume Discharged through 09/30/12 (gallons)	
Gallons	0	**Gallons**	857,738

Table C-3. Fourth Quarter Self-Monitoring Report for Excavation-Water Discharge at North St. Louis County Sites During CY 2012

Parameter	Batch Number	Date of Discharge	Batch Results[a]		Amount Discharged (Gallons)	Total Activity per Discharge[b] (Ci)	MSD Discharge Limit		SOR
Gross Alpha (raw water)	SLAPS-279	10/16/12 - 10/18/12 (Ballfields SLAPS VP)	<33	pCi/L	102,438	6.4E-06	3,000	pCi/L	0.02
Gross Beta			<50	pCi/L		9.6E-06	N/A		
Th-228			<0.4	pCi/L		8.1E-08	2,000	pCi/L	
Th-230			9	pCi/L		3.5E-06	1,000	pCi/L	
Uranium (KPA)			14	pCi/L		5.4E-06	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		4.4E-07	10	pCi/L	
Ra-228[d,e]			<0.4	pCi/L		8.1E-08	30	pCi/L	
Barium			[h]	mg/L		-	10	mg/L	
Lead			[h]	mg/L		-	0.4	mg/L	
Selenium[f]			[h]	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			11	pCi/L		-	-		
TSS			146	mg/L		-	-		
Gross Alpha (raw water)	SLAPS-280	12/04/12 - 12/06/12 (Ballfields SLAPS VP)	<11	pCi/L	155,829	3.2E-06	3,000	pCi/L	0.01
Gross Beta			<13	pCi/L		3.7E-06	N/A		
Th-228			<0.6	pCi/L		1.7E-07	2,000	pCi/L	
Th-230			4	pCi/L		2.1E-06	1,000	pCi/L	
Uranium (KPA)			12	pCi/L		7.1E-06	3,000	pCi/L	
Ra-226[c]			<2	pCi/L		5.4E-07	10	pCi/L	
Ra-228[d,e]			<0.6	pCi/L		1.7E-07	30	pCi/L	
Barium			[h]	mg/L		-	10	mg/L	
Lead			[h]	mg/L		-	0.4	mg/L	
Selenium[f]			[h]	mg/L		-	0.2	mg/L[f]	
BOD[g]			-	mg/L		-	-		
COD[g]			-	mg/L		-	-		
Gross Alpha (TSS filtrate)			<11	pCi/L		-	-		
TSS			44	mg/L		-	-		

Total Activity Discharged in 4th Quarter of CY 2012 (Ci)

Th-228	2.6E-07
Th-230	5.6E-06
U (KPA)	1.3E-05
Ra-226	9.8E-07
Ra-228[b]	2.6E-07

Total Activity Discharged through 12/31/12(Ci)

Th-228	1.8E-06
Th-230	1.5E-05
U (KPA)	6.5E-05
Ra-226	4.2E-06
Ra-228[b]	1.8E-06

Total Volume for 4th Quarter of CY 2012 (gallons)

Gallons 258,267

Total Volume Discharged through 12/31/12 (gallons)

Gallons 1,116,005

NOTES:

[a] Non-detect sample results are converted to half the detection limit for total activity.

[b] The weighted average was used to calculate the total activity.

[c] 10 *CFR* 20 limit is 600 pCi/L for Ra-226.

[d] Ra-228 assumed to be in equilibrium with Th-228.

[e] 10 *CFR* 20 limit is 600 pCi/L for Ra-228.

[f] The limit for selenium can be a daily total mass of 76 grams, with a concentration not to exceed 0.90 mg/L.

[g] MSD surcharges apply for BOD concentration > 300 mg/L and COD concentration > 600 mg/L.

[h] Analysis for metals is not required per MSD Letter 05/24/12.

TSS – total suspended solid(s)

mg/L – milligram(s) per liter

N/A – Not applicable

SOR – sum of ratios

pCi/L – picocurie(s) per liter

Ci – curie(s)

- No data/No limit

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APPENDIX D

COLDWATER CREEK SURFACE-WATER AND SEDIMENT DATA

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Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC142857	CWC002	03/14/12	Alpha Spec	Thorium-228	0.175	0.306	0.588	pCi/L	UJ	T06
CWC142857	CWC002	03/14/12	Alpha Spec	Thorium-230	0.456	0.384	0.42	pCi/L	J	F01, T04
CWC142857	CWC002	03/14/12	Alpha Spec	Thorium-232	-0.035	0.0702	0.42	pCi/L	UJ	T06
CWC142857	CWC002	03/14/12	Alpha Spec	Radium-226	-0.199	0.282	1.47	pCi/L	UJ	T06
CWC142857	CWC002	03/14/12	Alpha Spec	Uranium-234	0.821	0.498	0.394	pCi/L	J	T04
CWC142857	CWC002	03/14/12	Alpha Spec	Uranium-235	0.081	0.163	0.219	pCi/L	UJ	T06
CWC142857	CWC002	03/14/12	Alpha Spec	Uranium-238	0.36	0.332	0.392	pCi/L	U	T04, T05
CWC142857	CWC002	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142857	CWC002	03/14/12	Metals	Arsenic	2.9		0.95	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Barium	140		0.2	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Cadmium	0.11		0.1	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142857	CWC002	03/14/12	Metals	Molybdenum	10.6		1	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Nickel	2		0.4	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Selenium	1.7		1.6	µg/L	=	
CWC142857	CWC002	03/14/12	Metals	Thallium	0.68		0.55	µg/L	J	F01
CWC142857	CWC002	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142858	CWC002	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	19.6		0.1	percent	=	
CWC142859	CWC003	03/14/12	Alpha Spec	Thorium-228	0.427	0.388	0.232	pCi/L	J	T04
CWC142859	CWC003	03/14/12	Alpha Spec	Thorium-230	0.171	0.244	0.232	pCi/L	UJ	T06
CWC142859	CWC003	03/14/12	Alpha Spec	Thorium-232	-0.0427	0.0856	0.512	pCi/L	UJ	T06
CWC142859	CWC003	03/14/12	Alpha Spec	Radium-226	0.091	0.407	1.09	pCi/L	UJ	T06
CWC142859	CWC003	03/14/12	Alpha Spec	Uranium-234	1.45	0.626	0.157	pCi/L	=	
CWC142859	CWC003	03/14/12	Alpha Spec	Uranium-235	0.0716	0.144	0.194	pCi/L	UJ	T06
CWC142859	CWC003	03/14/12	Alpha Spec	Uranium-238	0.347	0.289	0.157	pCi/L	J	F01, T04
CWC142859	CWC003	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142859	CWC003	03/14/12	Metals	Arsenic	2.9		0.95	µg/L	=	
CWC142859	CWC003	03/14/12	Metals	Barium	135		0.2	µg/L	=	
CWC142859	CWC003	03/14/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC142859	CWC003	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142859	CWC003	03/14/12	Metals	Molybdenum	9		1	µg/L	=	
CWC142859	CWC003	03/14/12	Metals	Nickel	2.1		0.4	µg/L	=	
CWC142859	CWC003	03/14/12	Metals	Selenium	3.5		1.6	µg/L	=	
CWC142859	CWC003	03/14/12	Metals	Thallium	0.67		0.55	µg/L	J	F01
CWC142859	CWC003	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142860	CWC003	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	33.4		0.1	percent	=	
CWC142855	CWC004	03/14/12	Alpha Spec	Thorium-228	0.651	0.472	0.22	pCi/L	J	T04

Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC142855	CWC004	03/14/12	Alpha Spec	Thorium-230	0.652	0.472	0.221	pCi/L	J	F01, T04
CWC142855	CWC004	03/14/12	Alpha Spec	Thorium-232	0.0406	0.182	0.488	pCi/L	UJ	T06
CWC142855	CWC004	03/14/12	Alpha Spec	Radium-226	1.51	1.26	1.59	pCi/L	U	T04, T05
CWC142855	CWC004	03/14/12	Alpha Spec	Uranium-234	1.27	0.606	0.172	pCi/L	=	
CWC142855	CWC004	03/14/12	Alpha Spec	Uranium-235	-0.0391	0.0785	0.469	pCi/L	UJ	T06
CWC142855	CWC004	03/14/12	Alpha Spec	Uranium-238	1.04	0.553	0.379	pCi/L	J	F01, T04
CWC142855	CWC004	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142855	CWC004	03/14/12	Metals	Arsenic	3		0.95	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Barium	130		0.2	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Cadmium	0.13		0.1	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142855	CWC004	03/14/12	Metals	Molybdenum	9.3		1	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Nickel	2.9		0.4	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Selenium	2.7		1.6	µg/L	=	
CWC142855	CWC004	03/14/12	Metals	Thallium	2		0.55	µg/L	J	F01
CWC142855	CWC004	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142856	CWC004	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	48.4		0.1	percent	=	
CWC142861	CWC005	03/14/12	Alpha Spec	Thorium-228	0.257	0.305	0.44	pCi/L	UJ	T06
CWC142861	CWC005	03/14/12	Alpha Spec	Thorium-230	0.441	0.366	0.199	pCi/L	J	F01, T04
CWC142861	CWC005	03/14/12	Alpha Spec	Thorium-232	0	0	0.199	pCi/L	U	
CWC142861	CWC005	03/14/12	Alpha Spec	Radium-226	-4.65E-06	0.493	1.48	pCi/L	UJ	T06
CWC142861	CWC005	03/14/12	Alpha Spec	Uranium-234	0.571	0.396	0.361	pCi/L	J	T04
CWC142861	CWC005	03/14/12	Alpha Spec	Uranium-235	0	0	0.201	pCi/L	U	
CWC142861	CWC005	03/14/12	Alpha Spec	Uranium-238	0.569	0.395	0.359	pCi/L	J	F01, T04
CWC142861	CWC005	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142861	CWC005	03/14/12	Metals	Arsenic	1.7		0.95	µg/L	=	
CWC142861	CWC005	03/14/12	Metals	Barium	129		0.2	µg/L	=	
CWC142861	CWC005	03/14/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC142861	CWC005	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142861	CWC005	03/14/12	Metals	Molybdenum	3.6		1	µg/L	=	
CWC142861	CWC005	03/14/12	Metals	Nickel	3.2		0.4	µg/L	=	
CWC142861	CWC005	03/14/12	Metals	Selenium	1.8		1.6	µg/L	=	
CWC142861	CWC005	03/14/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC142861	CWC005	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142862	CWC005	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	62.3		0.1	percent	=	
CWC142863	CWC006	03/14/12	Alpha Spec	Thorium-228	0.0894	0.179	0.242	pCi/L	UJ	T06
CWC142863	CWC006	03/14/12	Alpha Spec	Thorium-230	0.403	0.415	0.537	pCi/L	UJ	T06

Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC142863	CWC006	03/14/12	Alpha Spec	Thorium-232	0	0	0.242	pCi/L	U	
CWC142863	CWC006	03/14/12	Alpha Spec	Radium-226	-0.215	0.608	2	pCi/L	UJ	T06
CWC142863	CWC006	03/14/12	Alpha Spec	Uranium-234	0.958	0.563	0.504	pCi/L	J	T04
CWC142863	CWC006	03/14/12	Alpha Spec	Uranium-235	0	0	0.229	pCi/L	U	
CWC142863	CWC006	03/14/12	Alpha Spec	Uranium-238	0.954	0.536	0.185	pCi/L	J	F01, T04
CWC142863	CWC006	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142863	CWC006	03/14/12	Metals	Arsenic	2.9		0.95	µg/L	=	
CWC142863	CWC006	03/14/12	Metals	Barium	139		0.2	µg/L	=	
CWC142863	CWC006	03/14/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC142863	CWC006	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142863	CWC006	03/14/12	Metals	Molybdenum	8.7		1	µg/L	=	
CWC142863	CWC006	03/14/12	Metals	Nickel	2.7		0.4	µg/L	=	
CWC142863	CWC006	03/14/12	Metals	Selenium	2.3		1.6	µg/L	=	
CWC142863	CWC006	03/14/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC142863	CWC006	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142864	CWC006	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	34.8		0.1	percent	=	
CWC142865	CWC007	03/14/12	Alpha Spec	Thorium-228	0.146	0.208	0.198	pCi/L	UJ	T06
CWC142865	CWC007	03/14/12	Alpha Spec	Thorium-230	0.585	0.46	0.539	pCi/L	J	F01, T04
CWC142865	CWC007	03/14/12	Alpha Spec	Thorium-232	0	0	0.198	pCi/L	U	
CWC142865	CWC007	03/14/12	Alpha Spec	Radium-226	0.208	0.657	1.53	pCi/L	UJ	T06
CWC142865	CWC007	03/14/12	Alpha Spec	Uranium-234	0.599	0.418	0.441	pCi/L	J	T04
CWC142865	CWC007	03/14/12	Alpha Spec	Uranium-235	0.0739	0.148	0.2	pCi/L	UJ	T06
CWC142865	CWC007	03/14/12	Alpha Spec	Uranium-238	0.597	0.39	0.162	pCi/L	J	F01, T04
CWC142865	CWC007	03/14/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC142865	CWC007	03/14/12	Metals	Arsenic	2.7		0.95	µg/L	=	
CWC142865	CWC007	03/14/12	Metals	Barium	128		0.2	µg/L	=	
CWC142865	CWC007	03/14/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC142865	CWC007	03/14/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC142865	CWC007	03/14/12	Metals	Molybdenum	8.3		1	µg/L	=	
CWC142865	CWC007	03/14/12	Metals	Nickel	2.8		0.4	µg/L	=	
CWC142865	CWC007	03/14/12	Metals	Selenium	2.7		1.6	µg/L	=	
CWC142865	CWC007	03/14/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC142865	CWC007	03/14/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC142866	CWC007	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	36.1		0.1	percent	=	
CWC146274	CWC002	10/09/12	Alpha Spec	Thorium-228	0.41	0.377	0.447	pCi/L	U	T04, T05
CWC146274	CWC002	10/09/12	Alpha Spec	Thorium-230	0.261	0.31	0.448	pCi/L	UJ	T06
CWC146274	CWC002	10/09/12	Alpha Spec	Thorium-232	0	0	0.202	pCi/L	U	

Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC146274	CWC002	10/09/12	Alpha Spec	Radium-226	-2.72E-05	0.48	1.44	pCi/L	UJ	T06
CWC146274	CWC002	10/09/12	Alpha Spec	Uranium-234	0.361	0.431	0.664	pCi/L	UJ	T06
CWC146274	CWC002	10/09/12	Alpha Spec	Uranium-235	0.223	0.319	0.302	pCi/L	UJ	T06
CWC146274	CWC002	10/09/12	Alpha Spec	Uranium-238	0.764	0.571	0.539	pCi/L	J	T04
CWC146274	CWC002	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146274	CWC002	10/09/12	Metals	Arsenic	2.3		1.2	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Barium	83.4		0.22	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Cadmium	0.15		0.1	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146274	CWC002	10/09/12	Metals	Molybdenum	17.8		1	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Nickel	1.8		0.4	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Selenium	2.9		1.6	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Thallium	0.7		0.55	µg/L	=	
CWC146274	CWC002	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146275	CWC002	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	15.8		0.1	percent	=	
CWC146276	CWC003	10/09/12	Alpha Spec	Thorium-228	0.073	0.231	0.538	pCi/L	UJ	T06
CWC146276	CWC003	10/09/12	Alpha Spec	Thorium-230	0.695	0.479	0.439	pCi/L	J	F01, T04
CWC146276	CWC003	10/09/12	Alpha Spec	Thorium-232	0.073	0.146	0.198	pCi/L	UJ	T06
CWC146276	CWC003	10/09/12	Alpha Spec	Radium-226	0.816	0.958	1.5	pCi/L	UJ	T06
CWC146276	CWC003	10/09/12	Alpha Spec	Uranium-234	1.3	0.734	0.599	pCi/L	J	T04
CWC146276	CWC003	10/09/12	Alpha Spec	Uranium-235	0.0502	0.225	0.602	pCi/L	UJ	T06
CWC146276	CWC003	10/09/12	Alpha Spec	Uranium-238	0.567	0.445	0.22	pCi/L	J	T04
CWC146276	CWC003	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146276	CWC003	10/09/12	Metals	Arsenic	2.8		1.2	µg/L	=	
CWC146276	CWC003	10/09/12	Metals	Barium	96.3		0.22	µg/L	=	
CWC146276	CWC003	10/09/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC146276	CWC003	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146276	CWC003	10/09/12	Metals	Molybdenum	18.2		1	µg/L	=	
CWC146276	CWC003	10/09/12	Metals	Nickel	2.2		0.4	µg/L	=	
CWC146276	CWC003	10/09/12	Metals	Selenium	1.6		1.6	µg/L	U	
CWC146276	CWC003	10/09/12	Metals	Thallium	1.1		0.55	µg/L	=	
CWC146276	CWC003	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146277	CWC003	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	25		0.1	percent	=	
CWC146278	CWC004	10/09/12	Alpha Spec	Thorium-228	0.133	0.189	0.181	pCi/L	UJ	T06
CWC146278	CWC004	10/09/12	Alpha Spec	Thorium-230	0.667	0.432	0.181	pCi/L	J	F01, T04
CWC146278	CWC004	10/09/12	Alpha Spec	Thorium-232	0	0	0.181	pCi/L	U	
CWC146278	CWC004	10/09/12	Alpha Spec	Radium-226	-0.214	0.605	1.98	pCi/L	UJ	T06

Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC146278	CWC004	10/09/12	Alpha Spec	Uranium-234	0.808	0.571	0.51	pCi/L	J	T04
CWC146278	CWC004	10/09/12	Alpha Spec	Uranium-235	0.105	0.211	0.284	pCi/L	UJ	T06
CWC146278	CWC004	10/09/12	Alpha Spec	Uranium-238	0.55	0.471	0.508	pCi/L	J	T04
CWC146278	CWC004	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146278	CWC004	10/09/12	Metals	Arsenic	2.6		1.2	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Barium	129		0.22	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Cadmium	0.12		0.1	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146278	CWC004	10/09/12	Metals	Molybdenum	20.2		1	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Nickel	2.8		0.4	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Selenium	2.8		1.6	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Thallium	0.57		0.55	µg/L	=	
CWC146278	CWC004	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146279	CWC004	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	40.8		0.1	percent	=	
CWC146280	CWC005	10/09/12	Alpha Spec	Thorium-228	0.241	0.285	0.412	pCi/L	UJ	T06
CWC146280	CWC005	10/09/12	Alpha Spec	Thorium-230	0.757	0.498	0.506	pCi/L	J	F01, T04
CWC146280	CWC005	10/09/12	Alpha Spec	Thorium-232	0.0343	0.154	0.412	pCi/L	UJ	T06
CWC146280	CWC005	10/09/12	Alpha Spec	Radium-226	0.222	1.04	2.39	pCi/L	UJ	T06
CWC146280	CWC005	10/09/12	Alpha Spec	Uranium-234	0.367	0.375	0.248	pCi/L	J	T02
CWC146280	CWC005	10/09/12	Alpha Spec	Uranium-235	-0.0565	0.114	0.678	pCi/L	UJ	T06
CWC146280	CWC005	10/09/12	Alpha Spec	Uranium-238	0.867	0.653	0.767	pCi/L	J	T04
CWC146280	CWC005	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146280	CWC005	10/09/12	Metals	Arsenic	2.7		1.2	µg/L	=	
CWC146280	CWC005	10/09/12	Metals	Barium	122		0.22	µg/L	=	
CWC146280	CWC005	10/09/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC146280	CWC005	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146280	CWC005	10/09/12	Metals	Molybdenum	21.3		1	µg/L	=	
CWC146280	CWC005	10/09/12	Metals	Nickel	2.9		0.4	µg/L	=	
CWC146280	CWC005	10/09/12	Metals	Selenium	2.9		1.6	µg/L	=	
CWC146280	CWC005	10/09/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC146280	CWC005	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146281	CWC005	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	32.6		0.1	percent	=	
CWC146282	CWC006	10/09/12	Alpha Spec	Thorium-228	0.377	0.348	0.463	pCi/L	U	T04, T05
CWC146282	CWC006	10/09/12	Alpha Spec	Thorium-230	0.22	0.303	0.529	pCi/L	UJ	T06
CWC146282	CWC006	10/09/12	Alpha Spec	Thorium-232	0	0	0.17	pCi/L	U	
CWC146282	CWC006	10/09/12	Alpha Spec	Radium-226	0.418	0.592	0.566	pCi/L	UJ	T06
CWC146282	CWC006	10/09/12	Alpha Spec	Uranium-234	0.584	0.502	0.614	pCi/L	U	T04, T05

Table D-1. Coldwater Creek Surface Water Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Method	Analyte	Result	Error	Detection Limit	Units	VQ	Validation Reason Code
CWC146282	CWC006	10/09/12	Alpha Spec	Uranium-235	-0.0515	0.104	0.618	pCi/L	UJ	T06
CWC146282	CWC006	10/09/12	Alpha Spec	Uranium-238	0.249	0.293	0.225	pCi/L	J	T02
CWC146282	CWC006	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146282	CWC006	10/09/12	Metals	Arsenic	2.4		1.2	µg/L	=	
CWC146282	CWC006	10/09/12	Metals	Barium	124		0.22	µg/L	=	
CWC146282	CWC006	10/09/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC146282	CWC006	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146282	CWC006	10/09/12	Metals	Molybdenum	17		1	µg/L	=	
CWC146282	CWC006	10/09/12	Metals	Nickel	3.4		0.4	µg/L	=	
CWC146282	CWC006	10/09/12	Metals	Selenium	2		1.6	µg/L	=	
CWC146282	CWC006	10/09/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC146282	CWC006	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146283	CWC006	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	30.3		0.1	percent	=	
CWC146284	CWC007	10/09/12	Alpha Spec	Thorium-228	0.155	0.225	0.373	pCi/L	UJ	T06
CWC146284	CWC007	10/09/12	Alpha Spec	Thorium-230	0.591	0.406	0.373	pCi/L	J	F01, T04
CWC146284	CWC007	10/09/12	Alpha Spec	Thorium-232	-0.0311	0.0622	0.373	pCi/L	UJ	T06
CWC146284	CWC007	10/09/12	Alpha Spec	Radium-226	-0.0959	0.508	1.61	pCi/L	UJ	T06
CWC146284	CWC007	10/09/12	Alpha Spec	Uranium-234	0.445	0.512	0.826	pCi/L	UJ	T06
CWC146284	CWC007	10/09/12	Alpha Spec	Uranium-235	0	0	0.297	pCi/L	U	
CWC146284	CWC007	10/09/12	Alpha Spec	Uranium-238	0.398	0.415	0.531	pCi/L	UJ	T06
CWC146284	CWC007	10/09/12	Metals	Antimony	1.7		1.7	µg/L	U	
CWC146284	CWC007	10/09/12	Metals	Arsenic	1.9		1.2	µg/L	=	
CWC146284	CWC007	10/09/12	Metals	Barium	106		0.22	µg/L	=	
CWC146284	CWC007	10/09/12	Metals	Cadmium	0.1		0.1	µg/L	U	
CWC146284	CWC007	10/09/12	Metals	Chromium	3.3		3.3	µg/L	U	
CWC146284	CWC007	10/09/12	Metals	Molybdenum	15.6		1	µg/L	=	
CWC146284	CWC007	10/09/12	Metals	Nickel	2.6		0.4	µg/L	=	
CWC146284	CWC007	10/09/12	Metals	Selenium	2.8		1.6	µg/L	=	
CWC146284	CWC007	10/09/12	Metals	Thallium	0.55		0.55	µg/L	U	
CWC146284	CWC007	10/09/12	Metals	Vanadium	2.4		2.4	µg/L	U	
CWC146285	CWC007	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	39.1		0.1	percent	=	

Cn – copernicium

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC142858	CWC002	03/14/12	Alpha Spec	Thorium-228	0.374	0.345	pCi/g	J	T04
CWC142858	CWC002	03/14/12	Alpha Spec	Thorium-230	0.519	0.156	pCi/g	J	F01, T04
CWC142858	CWC002	03/14/12	Alpha Spec	Thorium-232	0.345	0.156	pCi/g	J	T04
CWC142858	CWC002	03/14/12	Gamma Spec	Actinium-227	-0.0292	0.115	pCi/g	UJ	T04, T06
CWC142858	CWC002	03/14/12	Gamma Spec	Americium-241	0.0156	0.022	pCi/g	UJ	T04, T05
CWC142858	CWC002	03/14/12	Gamma Spec	Cesium-137	-0.00161	0.00987	pCi/g	UJ	T04, T06
CWC142858	CWC002	03/14/12	Gamma Spec	Potassium-40	7.01	0.105	pCi/g	=	
CWC142858	CWC002	03/14/12	Gamma Spec	Protactinium-231	0.107	0.336	pCi/g	UJ	T04, T06
CWC142858	CWC002	03/14/12	Gamma Spec	Radium-226	0.891	0.0272	pCi/g	=	
CWC142858	CWC002	03/14/12	Gamma Spec	Radium-228	0.238	0.0374	pCi/g	J	F01
CWC142858	CWC002	03/14/12	Gamma Spec	Thorium-228	0.238	0.0374	pCi/g	J	F01
CWC142858	CWC002	03/14/12	Gamma Spec	Thorium-230	1.51	2.27	pCi/g	UJ	T04, T05
CWC142858	CWC002	03/14/12	Gamma Spec	Thorium-232	0.238	0.0374	pCi/g	J	F01
CWC142858	CWC002	03/14/12	Gamma Spec	Uranium-235	0.00928	0.147	pCi/g	UJ	T04, T06
CWC142858	CWC002	03/14/12	Gamma Spec	Uranium-238	0.414	0.206	pCi/g	J	T04
CWC142858	CWC002	03/14/12	Metals	Antimony	0.8	0.8	mg/kg	UJ	H02
CWC142858	CWC002	03/14/12	Metals	Arsenic	5.3	0.39	mg/kg	=	
CWC142858	CWC002	03/14/12	Metals	Barium	18.2	0.31	mg/kg	J	E07
CWC142858	CWC002	03/14/12	Metals	Cadmium	0.12	0.12	mg/kg	U	
CWC142858	CWC002	03/14/12	Metals	Chromium	0.38	0.38	mg/kg	U	
CWC142858	CWC002	03/14/12	Metals	Molybdenum	1.2	1.2	mg/kg	U	
CWC142858	CWC002	03/14/12	Metals	Nickel	2.4	0.28	mg/kg	=	
CWC142858	CWC002	03/14/12	Metals	Selenium	0.62	0.62	mg/kg	U	
CWC142858	CWC002	03/14/12	Metals	Thallium	1.9	1.9	mg/kg	U	
CWC142858	CWC002	03/14/12	Metals	Vanadium	6.4	1.6	mg/kg	=	
CWC142858	CWC002	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	19.6	0.1	percent	=	
CWC142860	CWC003	03/14/12	Alpha Spec	Thorium-228	1.69	0.153	pCi/g	=	
CWC142860	CWC003	03/14/12	Alpha Spec	Thorium-230	1.81	0.153	pCi/g	J	F01
CWC142860	CWC003	03/14/12	Alpha Spec	Thorium-232	1.28	0.284	pCi/g	=	
CWC142860	CWC003	03/14/12	Gamma Spec	Actinium-227	0.0993	0.23	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Americium-241	-0.00608	0.079	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Cesium-137	-0.000618	0.0227	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Potassium-40	13.5	0.16	pCi/g	=	
CWC142860	CWC003	03/14/12	Gamma Spec	Protactinium-231	0.14	0.583	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Radium-226	1.07	0.0561	pCi/g	=	
CWC142860	CWC003	03/14/12	Gamma Spec	Radium-228	0.807	0.0858	pCi/g	=	

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC142860	CWC003	03/14/12	Gamma Spec	Thorium-228	0.807	0.0858	pCi/g	=	
CWC142860	CWC003	03/14/12	Gamma Spec	Thorium-230	0.58	6.36	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Thorium-232	0.807	0.0858	pCi/g	=	
CWC142860	CWC003	03/14/12	Gamma Spec	Uranium-235	0.0276	0.267	pCi/g	UJ	T04, T06
CWC142860	CWC003	03/14/12	Gamma Spec	Uranium-238	0.584	0.763	pCi/g	UJ	T04, T05
CWC142860	CWC003	03/14/12	Metals	Antimony	0.96	0.96	mg/kg	UJ	H02
CWC142860	CWC003	03/14/12	Metals	Arsenic	3.6	0.48	mg/kg	=	
CWC142860	CWC003	03/14/12	Metals	Barium	61.7	0.38	mg/kg	J	E07
CWC142860	CWC003	03/14/12	Metals	Cadmium	0.32	0.15	mg/kg	=	
CWC142860	CWC003	03/14/12	Metals	Chromium	9.8	0.46	mg/kg	=	
CWC142860	CWC003	03/14/12	Metals	Molybdenum	1.5	1.5	mg/kg	U	
CWC142860	CWC003	03/14/12	Metals	Nickel	9.4	0.34	mg/kg	=	
CWC142860	CWC003	03/14/12	Metals	Selenium	0.75	0.75	mg/kg	U	
CWC142860	CWC003	03/14/12	Metals	Thallium	2.3	2.3	mg/kg	U	
CWC142860	CWC003	03/14/12	Metals	Vanadium	13.9	1.9	mg/kg	=	
CWC142860	CWC003	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	33.4	0.1	percent	=	
CWC142856	CWC004	03/14/12	Alpha Spec	Thorium-228	1.72	0.458	pCi/g	=	
CWC142856	CWC004	03/14/12	Alpha Spec	Thorium-230	2.41	0.458	pCi/g	J	F01
CWC142856	CWC004	03/14/12	Alpha Spec	Thorium-232	1.45	0.207	pCi/g	J	T04
CWC142856	CWC004	03/14/12	Gamma Spec	Actinium-227	0.0827	0.336	pCi/g	UJ	T04, T06
CWC142856	CWC004	03/14/12	Gamma Spec	Americium-241	0.0407	0.111	pCi/g	UJ	T04, T06
CWC142856	CWC004	03/14/12	Gamma Spec	Cesium-137	0.0426	0.0408	pCi/g	UJ	T04
CWC142856	CWC004	03/14/12	Gamma Spec	Potassium-40	13.3	0.274	pCi/g	=	
CWC142856	CWC004	03/14/12	Gamma Spec	Protactinium-231	0.0978	0.844	pCi/g	UJ	T04, T06
CWC142856	CWC004	03/14/12	Gamma Spec	Radium-226	1.13	0.0729	pCi/g	=	
CWC142856	CWC004	03/14/12	Gamma Spec	Radium-228	0.852	0.0727	pCi/g	=	
CWC142856	CWC004	03/14/12	Gamma Spec	Thorium-228	0.852	0.0727	pCi/g	=	
CWC142856	CWC004	03/14/12	Gamma Spec	Thorium-230	1.76	8.81	pCi/g	UJ	T04, T06
CWC142856	CWC004	03/14/12	Gamma Spec	Thorium-232	0.852	0.0727	pCi/g	=	
CWC142856	CWC004	03/14/12	Gamma Spec	Uranium-235	0.202	0.407	pCi/g	UJ	T04, T06
CWC142856	CWC004	03/14/12	Gamma Spec	Uranium-238	1.32	0.953	pCi/g	J	T04
CWC142856	CWC004	03/14/12	Metals	Antimony	1.6	1.2	mg/kg	J	H02
CWC142856	CWC004	03/14/12	Metals	Arsenic	6.5	0.61	mg/kg	=	
CWC142856	CWC004	03/14/12	Metals	Barium	153	0.48	mg/kg	J	E07
CWC142856	CWC004	03/14/12	Metals	Cadmium	0.87	0.19	mg/kg	=	
CWC142856	CWC004	03/14/12	Metals	Chromium	22.6	0.6	mg/kg	=	

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC142856	CWC004	03/14/12	Metals	Molybdenum	1.9	1.9	mg/kg	U	
CWC142856	CWC004	03/14/12	Metals	Nickel	17.6	0.44	mg/kg	=	
CWC142856	CWC004	03/14/12	Metals	Selenium	0.97	0.97	mg/kg	=	
CWC142856	CWC004	03/14/12	Metals	Thallium	2.9	2.9	mg/kg	U	
CWC142856	CWC004	03/14/12	Metals	Vanadium	21	2.4	mg/kg	=	
CWC142856	CWC004	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	48.4	0.1	percent	=	
CWC142862	CWC005	03/14/12	Alpha Spec	Thorium-228	1.05	0.34	pCi/g	J	T04
CWC142862	CWC005	03/14/12	Alpha Spec	Thorium-230	4.3	0.286	pCi/g	=	
CWC142862	CWC005	03/14/12	Alpha Spec	Thorium-232	1.01	0.285	pCi/g	J	T04
CWC142862	CWC005	03/14/12	Gamma Spec	Actinium-227	0.097	0.585	pCi/g	UJ	T04, T06
CWC142862	CWC005	03/14/12	Gamma Spec	Americium-241	-0.00576	0.118	pCi/g	UJ	T04, T06
CWC142862	CWC005	03/14/12	Gamma Spec	Cesium-137	0.0595	0.0725	pCi/g	UJ	T04, T05
CWC142862	CWC005	03/14/12	Gamma Spec	Potassium-40	13.8	0.536	pCi/g	=	
CWC142862	CWC005	03/14/12	Gamma Spec	Protactinium-231	-0.627	1.66	pCi/g	UJ	T04, T06
CWC142862	CWC005	03/14/12	Gamma Spec	Radium-226	1.47	0.144	pCi/g	=	
CWC142862	CWC005	03/14/12	Gamma Spec	Radium-228	0.923	0.218	pCi/g	=	
CWC142862	CWC005	03/14/12	Gamma Spec	Thorium-228	0.923	0.218	pCi/g	=	
CWC142862	CWC005	03/14/12	Gamma Spec	Thorium-230	8.29	11.9	pCi/g	UJ	T04, T05
CWC142862	CWC005	03/14/12	Gamma Spec	Thorium-232	0.923	0.218	pCi/g	=	
CWC142862	CWC005	03/14/12	Gamma Spec	Uranium-235	0.403	0.726	pCi/g	UJ	T04, T06
CWC142862	CWC005	03/14/12	Gamma Spec	Uranium-238	1.98	1.03	pCi/g	J	T04
CWC142862	CWC005	03/14/12	Metals	Antimony	2.5	1.7	mg/kg	J	H02
CWC142862	CWC005	03/14/12	Metals	Arsenic	7.1	0.84	mg/kg	=	
CWC142862	CWC005	03/14/12	Metals	Barium	185	0.66	mg/kg	J	E07
CWC142862	CWC005	03/14/12	Metals	Cadmium	1.2	0.27	mg/kg	=	
CWC142862	CWC005	03/14/12	Metals	Chromium	26.6	0.81	mg/kg	=	
CWC142862	CWC005	03/14/12	Metals	Molybdenum	2.7	2.7	mg/kg	U	
CWC142862	CWC005	03/14/12	Metals	Nickel	21	0.6	mg/kg	=	
CWC142862	CWC005	03/14/12	Metals	Selenium	1.3	1.3	mg/kg	U	
CWC142862	CWC005	03/14/12	Metals	Thallium	4	4	mg/kg	U	
CWC142862	CWC005	03/14/12	Metals	Vanadium	23.9	3.3	mg/kg	=	
CWC142862	CWC005	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	62.3	0.1	percent	=	
CWC142864	CWC006	03/14/12	Alpha Spec	Thorium-228	1.38	0.342	pCi/g	=	
CWC142864	CWC006	03/14/12	Alpha Spec	Thorium-230	3.39	0.256	pCi/g	=	
CWC142864	CWC006	03/14/12	Alpha Spec	Thorium-232	1	0.256	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Actinium-227	-0.0172	0.238	pCi/g	UJ	T04, T06

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC142864	CWC006	03/14/12	Gamma Spec	Americium-241	0.0396	0.0968	pCi/g	UJ	T04, T06
CWC142864	CWC006	03/14/12	Gamma Spec	Cesium-137	0.00144	0.0281	pCi/g	UJ	T04, T06
CWC142864	CWC006	03/14/12	Gamma Spec	Potassium-40	13.9	0.188	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Protactinium-231	0.0101	0.721	pCi/g	UJ	T04, T06
CWC142864	CWC006	03/14/12	Gamma Spec	Radium-226	1.16	0.0633	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Radium-228	1.06	0.0755	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Thorium-228	1.06	0.0755	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Thorium-230	0.999	7.57	pCi/g	UJ	T04, T06
CWC142864	CWC006	03/14/12	Gamma Spec	Thorium-232	1.06	0.0755	pCi/g	=	
CWC142864	CWC006	03/14/12	Gamma Spec	Uranium-235	0.0935	0.31	pCi/g	UJ	T04, T06
CWC142864	CWC006	03/14/12	Gamma Spec	Uranium-238	1.13	0.774	pCi/g	J	T04
CWC142864	CWC006	03/14/12	Metals	Antimony	0.98	0.98	mg/kg	UJ	H02
CWC142864	CWC006	03/14/12	Metals	Arsenic	2.7	0.49	mg/kg	=	
CWC142864	CWC006	03/14/12	Metals	Barium	86.8	0.38	mg/kg	J	E07
CWC142864	CWC006	03/14/12	Metals	Cadmium	0.17	0.15	mg/kg	=	
CWC142864	CWC006	03/14/12	Metals	Chromium	10.5	0.47	mg/kg	=	
CWC142864	CWC006	03/14/12	Metals	Molybdenum	1.5	1.5	mg/kg	U	
CWC142864	CWC006	03/14/12	Metals	Nickel	11.5	0.34	mg/kg	=	
CWC142864	CWC006	03/14/12	Metals	Selenium	0.77	0.77	mg/kg	U	
CWC142864	CWC006	03/14/12	Metals	Thallium	2.3	2.3	mg/kg	U	
CWC142864	CWC006	03/14/12	Metals	Vanadium	14	1.9	mg/kg	=	
CWC142864	CWC006	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	34.8	0.1	percent	=	
CWC142866	CWC007	03/14/12	Alpha Spec	Thorium-228	2.07	0.156	pCi/g	=	
CWC142866	CWC007	03/14/12	Alpha Spec	Thorium-230	3.51	0.156	pCi/g	=	
CWC142866	CWC007	03/14/12	Alpha Spec	Thorium-232	1.14	0.289	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Actinium-227	0.107	0.215	pCi/g	UJ	T04, T06
CWC142866	CWC007	03/14/12	Gamma Spec	Americium-241	0.0143	0.0413	pCi/g	UJ	T04, T06
CWC142866	CWC007	03/14/12	Gamma Spec	Cesium-137	0.0389	0.0196	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Potassium-40	14.3	0.184	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Protactinium-231	-0.0817	0.57	pCi/g	UJ	T04, T06
CWC142866	CWC007	03/14/12	Gamma Spec	Radium-226	1.23	0.058	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Radium-228	0.888	0.0684	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Thorium-228	0.888	0.0684	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Thorium-230	2.55	4.05	pCi/g	UJ	T04, T05
CWC142866	CWC007	03/14/12	Gamma Spec	Thorium-232	0.888	0.0684	pCi/g	=	
CWC142866	CWC007	03/14/12	Gamma Spec	Uranium-235	0.0452	0.271	pCi/g	UJ	T04, T06

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC142866	CWC007	03/14/12	Gamma Spec	Uranium-238	1.2	0.379	pCi/g	=	
CWC142866	CWC007	03/14/12	Metals	Antimony	1.2	1	mg/kg	J	H02
CWC142866	CWC007	03/14/12	Metals	Arsenic	4.7	0.5	mg/kg	=	
CWC142866	CWC007	03/14/12	Metals	Barium	104	0.39	mg/kg	J	E07
CWC142866	CWC007	03/14/12	Metals	Cadmium	0.49	0.16	mg/kg	=	
CWC142866	CWC007	03/14/12	Metals	Chromium	13.6	0.48	mg/kg	=	
CWC142866	CWC007	03/14/12	Metals	Molybdenum	1.6	1.6	mg/kg	U	
CWC142866	CWC007	03/14/12	Metals	Nickel	13	0.35	mg/kg	=	
CWC142866	CWC007	03/14/12	Metals	Selenium	0.78	0.78	mg/kg	U	
CWC142866	CWC007	03/14/12	Metals	Thallium	2.4	2.4	mg/kg	U	
CWC142866	CWC007	03/14/12	Metals	Vanadium	15.7	2	mg/kg	=	
CWC142866	CWC007	03/14/12	Wet Chem, Anions, and Cn	Percent Moisture	36.1	0.1	percent	=	
CWC146275	CWC002	10/09/12	Alpha Spec	Thorium-228	0.374	0.243	pCi/g	J	T04
CWC146275	CWC002	10/09/12	Alpha Spec	Thorium-230	0.64	0.325	pCi/g	J	F01, T04
CWC146275	CWC002	10/09/12	Alpha Spec	Thorium-232	0.47	0.243	pCi/g	J	T04
CWC146275	CWC002	10/09/12	Gamma Spec	Actinium-227	0.0816	0.135	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Americium-241	0.00381	0.0246	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Cesium-137	0.00158	0.0125	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Potassium-40	10.6	0.0846	pCi/g	=	
CWC146275	CWC002	10/09/12	Gamma Spec	Protactinium-231	-0.198	0.324	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Radium-226	0.911	0.031	pCi/g	=	
CWC146275	CWC002	10/09/12	Gamma Spec	Radium-228	0.372	0.0427	pCi/g	=	
CWC146275	CWC002	10/09/12	Gamma Spec	Thorium-228	0.372	0.0427	pCi/g	=	
CWC146275	CWC002	10/09/12	Gamma Spec	Thorium-230	2.1	2.28	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Thorium-232	0.372	0.0427	pCi/g	=	
CWC146275	CWC002	10/09/12	Gamma Spec	Uranium-235	0.0908	0.162	pCi/g	UJ	T04, T06
CWC146275	CWC002	10/09/12	Gamma Spec	Uranium-238	0.562	0.23	pCi/g	=	
CWC146275	CWC002	10/09/12	Metals	Antimony	7.6	7.6	mg/kg	U	
CWC146275	CWC002	10/09/12	Metals	Arsenic	3.9	3.8	mg/kg	=	
CWC146275	CWC002	10/09/12	Metals	Barium	543	3	mg/kg	=	
CWC146275	CWC002	10/09/12	Metals	Cadmium	1.2	1.2	mg/kg	U	
CWC146275	CWC002	10/09/12	Metals	Chromium	12	3.6	mg/kg	J	H01, H04
CWC146275	CWC002	10/09/12	Metals	Molybdenum	11.9	11.9	mg/kg	U	
CWC146275	CWC002	10/09/12	Metals	Nickel	7.5	2.7	mg/kg	=	
CWC146275	CWC002	10/09/12	Metals	Selenium	5.9	5.9	mg/kg	U	
CWC146275	CWC002	10/09/12	Metals	Thallium	17.9	17.9	mg/kg	U	H04

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC146275	CWC002	10/09/12	Metals	Vanadium	15	15	mg/kg	U	
CWC146275	CWC002	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	15.8	0.1	percent	=	
CWC146277	CWC003	10/09/12	Alpha Spec	Thorium-228	1.23	0.347	pCi/g	=	
CWC146277	CWC003	10/09/12	Alpha Spec	Thorium-230	1.19	0.318	pCi/g	J	F01
CWC146277	CWC003	10/09/12	Alpha Spec	Thorium-232	1.18	0.128	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Actinium-227	-0.00113	0.248	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Americium-241	0.0134	0.0434	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Cesium-137	-0.0036	0.0276	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Potassium-40	13.1	0.195	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Protactinium-231	-0.258	0.665	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Radium-226	1.33	0.0664	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Radium-228	0.782	0.0977	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Thorium-228	0.782	0.0977	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Thorium-230	3.81	4.07	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Thorium-232	0.782	0.0977	pCi/g	=	
CWC146277	CWC003	10/09/12	Gamma Spec	Uranium-235	0.0155	0.311	pCi/g	UJ	T04, T06
CWC146277	CWC003	10/09/12	Gamma Spec	Uranium-238	0.882	0.483	pCi/g	UJ	T04
CWC146277	CWC003	10/09/12	Metals	Antimony	8.5	8.5	mg/kg	U	
CWC146277	CWC003	10/09/12	Metals	Arsenic	4.2	4.2	mg/kg	U	
CWC146277	CWC003	10/09/12	Metals	Barium	41.2	3.3	mg/kg	=	
CWC146277	CWC003	10/09/12	Metals	Cadmium	1.3	1.3	mg/kg	U	
CWC146277	CWC003	10/09/12	Metals	Chromium	8.1	4.1	mg/kg	J	H01, H04
CWC146277	CWC003	10/09/12	Metals	Molybdenum	13.3	13.3	mg/kg	U	
CWC146277	CWC003	10/09/12	Metals	Nickel	9.1	3	mg/kg	=	
CWC146277	CWC003	10/09/12	Metals	Selenium	6.7	6.7	mg/kg	U	
CWC146277	CWC003	10/09/12	Metals	Thallium	20.1	20.1	mg/kg	U	H04
CWC146277	CWC003	10/09/12	Metals	Vanadium	16.8	16.8	mg/kg	U	
CWC146277	CWC003	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	25	0.1	percent	=	
CWC146279	CWC004	10/09/12	Alpha Spec	Thorium-228	1.24	0.153	pCi/g	=	
CWC146279	CWC004	10/09/12	Alpha Spec	Thorium-230	1.28	0.284	pCi/g	J	F01
CWC146279	CWC004	10/09/12	Alpha Spec	Thorium-232	1.13	0.153	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Actinium-227	0.0525	0.192	pCi/g	UJ	T04, T06
CWC146279	CWC004	10/09/12	Gamma Spec	Americium-241	0.00207	0.0422	pCi/g	UJ	T04, T06
CWC146279	CWC004	10/09/12	Gamma Spec	Cesium-137	0.0411	0.0157	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Potassium-40	14.8	0.15	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Protactinium-231	0.331	0.54	pCi/g	UJ	T04, T06

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC146279	CWC004	10/09/12	Gamma Spec	Radium-226	1.28	0.0482	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Radium-228	0.864	0.0571	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Thorium-228	0.864	0.0571	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Thorium-230	0.246	4.12	pCi/g	UJ	T04, T06
CWC146279	CWC004	10/09/12	Gamma Spec	Thorium-232	0.864	0.0571	pCi/g	=	
CWC146279	CWC004	10/09/12	Gamma Spec	Uranium-235	0.0859	0.248	pCi/g	UJ	T04, T06
CWC146279	CWC004	10/09/12	Gamma Spec	Uranium-238	1.5	0.391	pCi/g	=	
CWC146279	CWC004	10/09/12	Metals	Antimony	10.8	10.8	mg/kg	U	
CWC146279	CWC004	10/09/12	Metals	Arsenic	5.4	5.4	mg/kg	U	
CWC146279	CWC004	10/09/12	Metals	Barium	161	4.2	mg/kg	=	
CWC146279	CWC004	10/09/12	Metals	Cadmium	1.7	1.7	mg/kg	U	
CWC146279	CWC004	10/09/12	Metals	Chromium	27	5.2	mg/kg	J	H01, H04
CWC146279	CWC004	10/09/12	Metals	Molybdenum	16.9	16.9	mg/kg	U	
CWC146279	CWC004	10/09/12	Metals	Nickel	19.1	3.8	mg/kg	=	
CWC146279	CWC004	10/09/12	Metals	Selenium	8.4	8.4	mg/kg	U	
CWC146279	CWC004	10/09/12	Metals	Thallium	25.5	25.5	mg/kg	U	H04
CWC146279	CWC004	10/09/12	Metals	Vanadium	22.1	21.3	mg/kg	=	
CWC146279	CWC004	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	40.8	0.1	percent	=	
CWC146281	CWC005	10/09/12	Alpha Spec	Thorium-228	1.3	0.141	pCi/g	=	
CWC146281	CWC005	10/09/12	Alpha Spec	Thorium-230	5.42	0.35	pCi/g	=	
CWC146281	CWC005	10/09/12	Alpha Spec	Thorium-232	1.23	0.261	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Actinium-227	0.000907	0.205	pCi/g	UJ	T04, T06
CWC146281	CWC005	10/09/12	Gamma Spec	Americium-241	0.00108	0.0399	pCi/g	UJ	T04, T06
CWC146281	CWC005	10/09/12	Gamma Spec	Cesium-137	0.0359	0.0207	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Potassium-40	15.3	0.142	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Protactinium-231	0.0144	0.56	pCi/g	UJ	T04, T06
CWC146281	CWC005	10/09/12	Gamma Spec	Radium-226	1.33	0.0495	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Radium-228	0.9	0.0663	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Thorium-228	0.9	0.0663	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Thorium-230	6.03	3.54	pCi/g	J	T04
CWC146281	CWC005	10/09/12	Gamma Spec	Thorium-232	0.9	0.0663	pCi/g	=	
CWC146281	CWC005	10/09/12	Gamma Spec	Uranium-235	-0.0327	0.249	pCi/g	UJ	T04, T06
CWC146281	CWC005	10/09/12	Gamma Spec	Uranium-238	1.25	0.361	pCi/g	=	
CWC146281	CWC005	10/09/12	Metals	Antimony	9.5	9.5	mg/kg	U	
CWC146281	CWC005	10/09/12	Metals	Arsenic	4.8	4.7	mg/kg	=	
CWC146281	CWC005	10/09/12	Metals	Barium	134	3.7	mg/kg	=	

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC146281	CWC005	10/09/12	Metals	Cadmium	1.5	1.5	mg/kg	U	
CWC146281	CWC005	10/09/12	Metals	Chromium	21.4	4.6	mg/kg	J	H01, H04
CWC146281	CWC005	10/09/12	Metals	Molybdenum	14.8	14.8	mg/kg	U	
CWC146281	CWC005	10/09/12	Metals	Nickel	17.7	3.3	mg/kg	=	
CWC146281	CWC005	10/09/12	Metals	Selenium	7.4	7.4	mg/kg	U	
CWC146281	CWC005	10/09/12	Metals	Thallium	22.4	22.4	mg/kg	U	H04
CWC146281	CWC005	10/09/12	Metals	Vanadium	21.7	18.7	mg/kg	=	
CWC146281	CWC005	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	32.6	0.1	percent	=	
CWC146283	CWC006	10/09/12	Alpha Spec	Thorium-228	1.03	0.276	pCi/g	=	
CWC146283	CWC006	10/09/12	Alpha Spec	Thorium-230	1.78	0.329	pCi/g	J	F01
CWC146283	CWC006	10/09/12	Alpha Spec	Thorium-232	1.3	0.276	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Actinium-227	0.0125	0.242	pCi/g	UJ	T04, T06
CWC146283	CWC006	10/09/12	Gamma Spec	Americium-241	0.0317	0.0465	pCi/g	UJ	T04, T05
CWC146283	CWC006	10/09/12	Gamma Spec	Cesium-137	-0.0131	0.0266	pCi/g	UJ	T04, T06
CWC146283	CWC006	10/09/12	Gamma Spec	Potassium-40	14.1	0.238	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Protactinium-231	0.245	0.713	pCi/g	UJ	T04, T06
CWC146283	CWC006	10/09/12	Gamma Spec	Radium-226	1.02	0.0654	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Radium-228	0.938	0.0786	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Thorium-228	0.938	0.0786	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Thorium-230	2.65	4.66	pCi/g	UJ	T04, T06
CWC146283	CWC006	10/09/12	Gamma Spec	Thorium-232	0.938	0.0786	pCi/g	=	
CWC146283	CWC006	10/09/12	Gamma Spec	Uranium-235	-0.0173	0.31	pCi/g	UJ	T04, T06
CWC146283	CWC006	10/09/12	Gamma Spec	Uranium-238	0.987	0.448	pCi/g	=	
CWC146283	CWC006	10/09/12	Metals	Antimony	9.2	9.2	mg/kg	U	
CWC146283	CWC006	10/09/12	Metals	Arsenic	11.1	4.5	mg/kg	=	
CWC146283	CWC006	10/09/12	Metals	Barium	125	3.6	mg/kg	=	
CWC146283	CWC006	10/09/12	Metals	Cadmium	1.4	1.4	mg/kg	U	
CWC146283	CWC006	10/09/12	Metals	Chromium	15.1	4.4	mg/kg	J	H01, H04
CWC146283	CWC006	10/09/12	Metals	Molybdenum	14.4	14.4	mg/kg	U	
CWC146283	CWC006	10/09/12	Metals	Nickel	17.9	3.2	mg/kg	=	
CWC146283	CWC006	10/09/12	Metals	Selenium	7.2	7.2	mg/kg	U	
CWC146283	CWC006	10/09/12	Metals	Thallium	21.7	21.7	mg/kg	U	H04
CWC146283	CWC006	10/09/12	Metals	Vanadium	25	18.1	mg/kg	=	
CWC146283	CWC006	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	30.3	0.1	percent	=	
CWC146285	CWC007	10/09/12	Alpha Spec	Thorium-228	0.963	0.35	pCi/g	J	T04
CWC146285	CWC007	10/09/12	Alpha Spec	Thorium-230	2.73	0.294	pCi/g	J	F01

Table D-2. Coldwater Creek Sediment Data for CY 2012

Sample Name	Station Name	Sample Collection Date	Analytical Method	Analyte	Analytical Result	Detection Limit	Units	VQ	Validation Reason Code
CWC146285	CWC007	10/09/12	Alpha Spec	Thorium-232	0.7	0.158	pCi/g	J	T04
CWC146285	CWC007	10/09/12	Gamma Spec	Actinium-227	0.028	0.2	pCi/g	UJ	T04, T06
CWC146285	CWC007	10/09/12	Gamma Spec	Americium-241	0.00649	0.0369	pCi/g	UJ	T04, T06
CWC146285	CWC007	10/09/12	Gamma Spec	Cesium-137	0.031	0.0174	pCi/g	J	T04
CWC146285	CWC007	10/09/12	Gamma Spec	Potassium-40	14.7	0.143	pCi/g	=	
CWC146285	CWC007	10/09/12	Gamma Spec	Protactinium-231	-0.165	0.502	pCi/g	UJ	T04, T06
CWC146285	CWC007	10/09/12	Gamma Spec	Radium-226	1.06	0.048	pCi/g	=	
CWC146285	CWC007	10/09/12	Gamma Spec	Radium-228	0.802	0.0567	pCi/g	=	
CWC146285	CWC007	10/09/12	Gamma Spec	Thorium-228	0.802	0.0567	pCi/g	=	
CWC146285	CWC007	10/09/12	Gamma Spec	Thorium-230	4.95	3.27	pCi/g	J	T04
CWC146285	CWC007	10/09/12	Gamma Spec	Thorium-232	0.802	0.0567	pCi/g	=	
CWC146285	CWC007	10/09/12	Gamma Spec	Uranium-235	0.0629	0.234	pCi/g	UJ	T04, T06
CWC146285	CWC007	10/09/12	Gamma Spec	Uranium-238	1.51	0.339	pCi/g	=	
CWC146285	CWC007	10/09/12	Metals	Antimony	10.5	10.5	mg/kg	U	
CWC146285	CWC007	10/09/12	Metals	Arsenic	5.2	5.2	mg/kg	U	
CWC146285	CWC007	10/09/12	Metals	Barium	128	4.1	mg/kg	=	
CWC146285	CWC007	10/09/12	Metals	Cadmium	1.6	1.6	mg/kg	U	
CWC146285	CWC007	10/09/12	Metals	Chromium	20	5	mg/kg	J	H01, H04
CWC146285	CWC007	10/09/12	Metals	Molybdenum	16.4	16.4	mg/kg	U	
CWC146285	CWC007	10/09/12	Metals	Nickel	16.6	3.7	mg/kg	=	
CWC146285	CWC007	10/09/12	Metals	Selenium	8.2	8.2	mg/kg	U	
CWC146285	CWC007	10/09/12	Metals	Thallium	24.8	24.8	mg/kg	U	H04
CWC146285	CWC007	10/09/12	Metals	Vanadium	23.5	20.7	mg/kg	=	
CWC146285	CWC007	10/09/12	Wet Chem, Anions, and Cn	Percent Moisture	39.1	0.1	percent	=	

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APPENDIX E

GROUND-WATER FIELD PARAMETER DATA AND ANALYTICAL DATA RESULTS FOR CY 2012

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Table E-1. Ground-Water Monitoring
First Quarter 2012 - Field Parameters for the Latty Avenue Properties

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 02/27/12
HISS/Futura	HISS-01	02/28/12	55	825	7.03	0.13	20.9	7.14	10.4	129	8.75	8.55
HISS/Futura	HISS-06A	02/28/12	60	900	6.6	0.222	31.4	1.31	12	121	8.12	7.95
HISS/Futura	HISS-10	---	---	---	---	---	---	---	---	---	---	6.05
HISS/Futura	HISS-11A	02/28/12	50	900	6.61	78.7	15.7	2.73	11.5	140	11.3	10.16
HISS/Futura	HISS-17S	---	---	---	---	---	---	---	---	---	---	6.48
HISS/Futura	HISS-19S	---	---	---	---	---	---	---	---	---	---	12.92
HISS/Futura	HW22	---	---	---	---	---	---	---	---	---	---	9.64
HISS/Futura	HW23	---	---	---	---	---	---	---	---	---	---	12.95

Table E-1. Ground-Water Monitoring
Second Quarter 2012 - Field Parameters for the Latty Avenue Properties

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 05/24/12
HISS/Futura	HISS-01	---	---	---	---	---	---	---	---	---	---	---
HISS/Futura	HISS-06A	---	---	---	---	---	---	---	---	---	---	8.3
HISS/Futura	HISS-10	---	---	---	---	---	---	---	---	---	---	7.13
HISS/Futura	HISS-11A	05/29/12	50	1,050	6.49	77.9	89.8	0.94	18	109	13.3	11.79
HISS/Futura	HISS-17S	05/29/12	75	1,375	6.85	47.9	199	1.27	15.4	75	8.25	7.35
HISS/Futura	HISS-19	05/29/12	80	1,180	6.44	0.118	177	1.41	21.1	-161	14.8	14.22
HISS/Futura	HW22	---	---	---	---	---	---	---	---	---	---	9.85
HISS/Futura	HW23	---	---	---	---	---	---	---	---	---	---	13.42

Table E-1. Ground-Water Monitoring
Third Quarter 2012 - Field Parameters for the Latty Avenue Properties

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 08/20/12
HISS/Futura	HISS-01	08/21/12	100	1,200	6.67	0.144	65	1.99	23	84	14.96	14.67
HISS/Futura	HISS-06A	08/21/12	60	1,080	6.52	0.232	73.1	1.1	24.5	20	11.03	10.9
HISS/Futura	HISS-10	---	---	---	---	---	---	---	---	---	---	12.35
HISS/Futura	HISS-11A	08/21/12	50	900	6.57	79.4	11.6	1.13	20.7	117	15.08	14.22
HISS/Futura	HISS-17S	---	---	---	---	---	---	---	---	---	---	9.19
HISS/Futura	HISS-19	---	---	---	---	---	---	---	---	---	---	15.14
HISS/Futura	HW22	08/21/12	35	630	6.93	0.116	104	4.12	22.9	-185	10.43	10.28
HISS/Futura	HW23	---	---	---	---	---	---	---	---	---	---	17.87

Table E-1. Ground-Water Monitoring
Fourth Quarter 2012 - Field Parameters for the Latty Avenue Properties

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 12/07/12
HISS/Futura	HISS-01	---	---	---	---	---	---	---	---	---	---	10.36
HISS/Futura	HISS-06A	---	---	---	---	---	---	---	---	---	---	9.09
HISS/Futura	HISS-10	---	---	---	---	---	---	---	---	---	---	8.54
HISS/Futura	HISS-11A	---	---	---	---	---	---	---	---	---	---	12.47
HISS/Futura	HISS-17S	12/11/12	80	960	7.17	47.3	4.9	3.58	16.1	51	7	6.44
HISS/Futura	HISS-19	---	---	---	---	---	---	---	---	---	---	14.5
HISS/Futura	HW22	---	---	---	---	---	---	---	---	---	---	10.06
HISS/Futura	HW23	---	---	---	---	---	---	---	---	---	---	13.85

--- monitoring well was not sampled during this event.

BTOC – Below top of casing

mL – milliliter(s)

mL/min – milliliters per minute

Table E-2. Ground-Water Monitoring
First Quarter 2012 - Field Parameters for SLAPS and SLAPS VPs

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 02/27/12
SLAPS and SLAPS VPs	B53W01D	---	---	---	---	---	---	---	---	---	---	10.65
SLAPS and SLAPS VPs	B53W01S	---	---	---	---	---	---	---	---	---	---	13.24
SLAPS and SLAPS VPs	B53W06S	---	---	---	---	---	---	---	---	---	---	14.99
SLAPS and SLAPS VPs	B53W07D	---	---	---	---	---	---	---	---	---	---	10.73
SLAPS and SLAPS VPs	B53W07S	---	---	---	---	---	---	---	---	---	---	17.69
SLAPS and SLAPS VPs	B53W09S	---	---	---	---	---	---	---	---	---	---	15
SLAPS and SLAPS VPs	B53W13S	---	---	---	---	---	---	---	---	---	---	9.9
SLAPS and SLAPS VPs	B53W17S	---	---	---	---	---	---	---	---	---	---	7.31
SLAPS and SLAPS VPs	B53W18S	03/01/12	90	1,350	6.55	0.481	98.5	3.03	15.3	108	13.5	13.21
SLAPS and SLAPS VPs	B53W19S	02/27/12	160	2,780	6.64	0.227	47.8	2.01	14	59	7.1	6.79
SLAPS and SLAPS VPs	MW31-98	---	---	---	---	---	---	---	---	---	---	8.41
SLAPS and SLAPS VPs	MW32-98	---	---	---	---	---	---	---	---	---	---	12.82
SLAPS and SLAPS VPs	PW35	---	---	---	---	---	---	---	---	---	---	9.53
SLAPS and SLAPS VPs	PW36	---	---	---	---	---	---	---	---	---	---	9.8
SLAPS and SLAPS VPs	PW42	---	---	---	---	---	---	---	---	---	---	10.63
SLAPS and SLAPS VPs	PW43	---	---	---	---	---	---	---	---	---	---	14.35
SLAPS and SLAPS VPs	PW44	---	---	---	---	---	---	---	---	---	---	3.86
SLAPS and SLAPS VPs	PW45	---	---	---	---	---	---	---	---	---	---	7.02
SLAPS and SLAPS VPs	PW46	02/27/12	50	600	6.48	0.244	38.2	3.72	12.5	134	12.09	11.15

Table E-2. Ground-Water Monitoring
Second Quarter 2012 - Field Parameters for SLAPS and SLAPS VPs

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (μS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 05/24/12
SLAPS and SLAPS VPs	B53W01D	---	---	---	---	---	---	---	---	---	---	10.8
SLAPS and SLAPS VPs	B53W01S	05/29/12	50	750	6.55	0.094	53.1	2.66	19.9	159	14.52	14.06
SLAPS and SLAPS VPs	B53W06S	---	---	---	---	---	---	---	---	---	---	14.5
SLAPS and SLAPS VPs	B53W07D	---	---	---	---	---	---	---	---	---	---	10.81
SLAPS and SLAPS VPs	B53W07S	---	---	---	---	---	---	---	---	---	---	17.23
SLAPS and SLAPS VPs	B53W09S	---	---	---	---	---	---	---	---	---	---	14.62
SLAPS and SLAPS VPs	B53W13S	05/30/12	60	1,080	6.59	0.333	76.7	0.81	16.1	159	8.39	9.71
SLAPS and SLAPS VPs	B53W17S	---	---	---	---	---	---	---	---	---	---	8.02
SLAPS and SLAPS VPs	B53W18S	---	---	---	---	---	---	---	---	---	---	13.3
SLAPS and SLAPS VPs	B53W19S	---	---	---	---	---	---	---	---	---	---	6.81
SLAPS and SLAPS VPs	MW31-98	---	---	---	---	---	---	---	---	---	---	8.45
SLAPS and SLAPS VPs	MW32-98	---	---	---	---	---	---	---	---	---	---	12.46
SLAPS and SLAPS VPs	PW35	---	---	---	---	---	---	---	---	---	---	10.14
SLAPS and SLAPS VPs	PW36	---	---	---	---	---	---	---	---	---	---	10.02
SLAPS and SLAPS VPs	PW42	---	---	---	---	---	---	---	---	---	---	10.66
SLAPS and SLAPS VPs	PW43	---	---	---	---	---	---	---	---	---	---	12.85
SLAPS and SLAPS VPs	PW44	---	---	---	---	---	---	---	---	---	---	4.97
SLAPS and SLAPS VPs	PW45	---	---	---	---	---	---	---	---	---	---	7.71
SLAPS and SLAPS VPs	PW46	---	---	---	---	---	---	---	---	---	---	12.55

Table E-2. Ground-Water Monitoring
Third Quarter 2012 - Field Parameters for SLAPS and SLAPS VPs

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 08/20/12
SLAPS and SLAPS VPs	B53W01D	---	---	---	---	---	---	---	---	---	---	11.2
SLAPS and SLAPS VPs	B53W01S	---	---	---	---	---	---	---	---	---	---	20.45
SLAPS and SLAPS VPs	B53W06S	---	---	---	---	---	---	---	---	---	---	16.72
SLAPS and SLAPS VPs	B53W07D	---	---	---	---	---	---	---	---	---	---	11.36
SLAPS and SLAPS VPs	B53W07S	---	---	---	---	---	---	---	---	---	---	20.79
SLAPS and SLAPS VPs	B53W09S	08/23/12	30	450	6.49	0.15	24.3	2.54	17.9	139	18.54	17.19
SLAPS and SLAPS VPs	B53W13S	---	---	---	---	---	---	---	---	---	---	15.43
SLAPS and SLAPS VPs	B53W17S	---	---	---	---	---	---	---	---	---	---	13.48
SLAPS and SLAPS VPs	B53W18S	---	---	---	---	---	---	---	---	---	---	17.7
SLAPS and SLAPS VPs	B53W19S	---	---	---	---	---	---	---	---	---	---	11.22
SLAPS and SLAPS VPs	MW31-98	---	---	---	---	---	---	---	---	---	---	18.66
SLAPS and SLAPS VPs	MW32-98	08/23/12	80	960	6.46	0.137	121	1.94	19.6	98	18.01	17.78
SLAPS and SLAPS VPs	PW35	---	---	---	---	---	---	---	---	---	---	10.4
SLAPS and SLAPS VPs	PW36	---	---	---	---	---	---	---	---	---	---	10.55
SLAPS and SLAPS VPs	PW42	---	---	---	---	---	---	---	---	---	---	11.46
SLAPS and SLAPS VPs	PW43	08/22/12	50	900	6.35	0.123	58.9	1.43	22.8	3	20.68	20.17
SLAPS and SLAPS VPs	PW44	---	---	---	---	---	---	---	---	---	---	9.95
SLAPS and SLAPS VPs	PW45	---	---	---	---	---	---	---	---	---	---	10.75
SLAPS and SLAPS VPs	PW46	---	---	---	---	---	---	---	---	---	---	19.87

Table E-2. Ground-Water Monitoring
Fourth Quarter 2012 - Field Parameters for SLAPS and SLAPS VPs

Site	Station ID	Date Sampled	Purge Rate (mL/min)	mL Removed (mL)	pH	Conductivity (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water at Sampling Time	Depth to Water (BTOC) 12/07/12
SLAPS and SLAPS VPs	B53W01D											11.35
SLAPS and SLAPS VPs	B53W01S											18.24
SLAPS and SLAPS VPs	B53W06S	12/11/12	22	330	6.31	0.191	46.2	3.07	13.8	66	18.92	17.39
SLAPS and SLAPS VPs	B53W07D											11.54
SLAPS and SLAPS VPs	B53W07S											21.7
SLAPS and SLAPS VPs	B53W09S											17.85
SLAPS and SLAPS VPs	B53W13S	12/11/12	60	900	6.48	0.336	44.3	1.41	14.3	-16	16.68	15.75
SLAPS and SLAPS VPs	B53W17S											18.08
SLAPS and SLAPS VPs	B53W18S											13.38
SLAPS and SLAPS VPs	B53W19S											8.36
SLAPS and SLAPS VPs	MW31-98	12/11/12	60	720	6.37	0.4	21.2	1.71	12.1	100	20.97	20.67
SLAPS and SLAPS VPs	MW32-98											18.7
SLAPS and SLAPS VPs	PW35											10.05
SLAPS and SLAPS VPs	PW36	12/11/12	300	3,600	6.42	0.104	166	0.69	14.2	-197	10.79	10.65
SLAPS and SLAPS VPs	PW42											11.62
SLAPS and SLAPS VPs	PW43											21.33
SLAPS and SLAPS VPs	PW44											5.93
SLAPS and SLAPS VPs	PW45											9.77
SLAPS and SLAPS VPs	PW46											16.12

--- monitoring well was not sampled during this event.

APPENDIX F

CALCULATION OF THE RECORD OF DECISION GROUND-WATER EVALUATION GUIDELINES

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CALCULATION OF THE RECORD OF DECISION GROUND-WATER MONITORING GUIDELINES

This appendix briefly outlines the methodology used to develop the ground-water monitoring guidelines for select wells and analytes at the NC Sites. The development of these guidelines was necessary to meet the requirements of response-action monitoring and long-term monitoring specified in the ROD (USACE 2005). These requirements are also identified in the EMICY12 (USACE 2011). The results of these calculations are used in the EMDAR to evaluate ground-water monitoring data at the Latty Avenue Properties and the SLAPS and SLAPS VPs for CY 2012.

Introduction

Response-action monitoring is conducted for HZ-A and HZ-C ground water at the NC Sites to assess if water quality has improved due to source removals or if ground-water conditions have significantly degraded. Based on the ROD, a significantly degraded ground-water condition requires all of the following:

1) that soil COC concentrations have statistically increased in ground water (relative to the well's historical data and accounting for uncertainty) for more than a 12-month period. Significantly increased concentrations are defined as doubling of an individual COC concentration above the UCL of the mean (based on the historical concentration before remedial activity) for a period of 12 months;
2) that the degraded well is close enough to impact Coldwater Creek; and
3) that a significant degrading of Coldwater Creek surface water is anticipated (USACE 2005).

In addition to the previous requirements, the ROD specifies that the maximum contaminant level for total U of 30 µg/L be used as a monitoring guideline for both the response-action and long-term monitoring of ground water. If ground-water monitoring indicates the presence of COCs at significantly increased concentrations and total U significantly above 30 µg/L, then an evaluation of potential response actions would be conducted.

Methodology

In order to evaluate ground water for significant degradation, the UCL must be calculated using the historical ground-water data (i.e., data collected before remedial activity). The UCL is used to represent a historical average concentration for an analyte in a particular well. As stated in the USEPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term* (USEPA 1992), "because of the uncertainty associated with estimating the true average concentration at a site, the UCL_{95} of the arithmetic mean should be used for this variable." Based on the previously specified guidance, a 95 percent confidence interval was used in the UCL calculations.

Consistent with the ROD, UCL_{95} values for the soil COCs are used in the CY 2012 EMDAR to evaluate if concentrations have statistically increased in ground water for more than a 12-month period. The soil COCs defined in the ROD include antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, total U, vanadium, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238. Because the SLAPS well PW46 is a replacement well, pre-2006 data from PW38 was used to develop the ground-water monitoring guideline to compare with the PW46 results. PW46 was installed in April of 2006 near the former location of PW38 and is screened across the same interval. Similarly, pre-2006 data from HISS-06 and HISS-11 were used to develop the ground-water monitoring guidelines for the two replacement wells (HISS-06A and HISS-11A) installed in CY 2011 at the HISS. For wells located in areas in which a response action has been taken, significant degradation is defined as occurring if the concentration of any COC in a recent sample from that well is double its UCL_{95}, and the total U is significantly above 30 µg/L. The ROD ground-water monitoring guideline for the soil COC for a particular well is defined as equivalent to two times the UCL_{95} value.

The dataset used for this evaluation was reduced prior to performing the statistical analysis. Filtered data, results qualified with an "R" designation, and QC samples were removed from each of the data sets. The analytical result was used when the data qualifier was assigned an "=" or a "J". For nondetect chemical data (i.e., the data qualifier was assigned a "U" or "UJ"), the value used in the UCL_{95} calculation was half the DL. For nondetect radiological data, the reported value was used, except in cases in which the value reported was negative. In those cases, a value of zero was substituted for the negative value.

Results

The USEPA software package ProUCL (Version 4.0) was used to calculate the UCL_{95} value. ProUCL computes parametric UCLs (for normal, lognormal, and gamma distributions) and nonparametric UCLs using several nonparametric methods (USEPA 2004). Based upon the data distribution and the associated skewness, ProUCL performs and recommends the appropriate UCL.

The UCL_{95} values are those recommended by ProUCL with the following exceptions.

- If the calculated UCL_{95} exceeded the maximum detected value, then the maximum detected value was used, as recommended in the USEPA's *Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A)* (USEPA 1989d).
- If there were no detected values for the COC in the historical database for that well, then the UCL_{95} was not determined. If there were only one detected value of the COC, then the detected value was used.

The ground-water monitoring guidelines based on these UCL_{95} values are listed in Tables F-1 and F-2 for the Latty Avenue Properties and the SLAPS and SLAPS VPs, respectively.

Table F-1. ROD Monitoring Guidelines for Ground Water at the Latty Avenue Properties

Analyte Type	Soil COCs	HISS-01	HISS-06A[a]	HISS-09	HISS-10	HISS-11A[a]	HISS-14
Inorganics (µg/L)	Antimony	12	---	---	---	---	---
	Arsenic	---	---	---	---	5.2	---
	Barium	250	240	420	270	370	1,080
	Cadmium	---	---	---	1.4	---	---
	Chromium	13	2.2	---	2.4	7.0	---
	Molybdenum	23	40	22	5.6	4.8	---
	Nickel	20	34	21	3.8	20	11
	Selenium	570	770	19	7.6	---	610
	Thallium	4.6	---	---	---	---	5.8
	Total Uranium	30	30	30	30	30	30
	Vanadium	37	31	17	16	---	250
Radionuclides (pCi/L)	Ra-226	5.3	---	---	---	16	4.2
	Th-228	1.9	2.4	3.2	3.4	3.4	2.0
	Th-230	4.2	7.0	7.4	6.0	5.0	21
	Th-232	---	1.8	---	0.2	---	---
	U-234	12	32	1.8	6.6	4.8	14
	U-235	---	4.2	---	---	---	---
	U-238	13	31	1.4	5.2	3.0	11

Table F-1. ROD Monitoring Guidelines for Ground Water at the Latty Avenue Properties

Analyte Type	Soil COCs	HISS-17S	HISS-18S	HISS-19S	HW21	HW22	HW23
Inorganics (µg/L)	**Antimony**	---	---	7.4	---	---	4.6
	Arsenic	---	6.6	510	6.8	2.4	320
	Barium	500	410	1,200	3,700	460	810
	Cadmium	---	---	---	2.8	1.6	3.4
	Chromium	12	---	3.0	7.0	9.0	8.1
	Molybdenum	16	---	10	5.6	3.4	26
	Nickel	30	39	7.0	44	7.0	12
	Selenium	250	---	---	110	17	---
	Thallium	---	---	8.0	6.2	---	5.4
	Total Uranium	30	30	30	30	30	30
	Vanadium	18	16	4.4	12	4.0	6.4
Radionuclides (pCi/L)	**Ra-226**	5.7	5.5	2.5	8.4	11	2.4
	Th-228	2.4	3.2	10	4.2	1.8	2.6
	Th-230	3.8	5.8	12	5.2	3.8	5.2
	Th-232	---	1.9	---	---	---	1.0
	U-234	8.2	8.2	---	24	6.4	3.8
	U-235	---	---	---	2.0	---	---
	U-238	5.6	3.7	---	16	5.4	3.2

Notes:

[a] The ROD Evaluation Criteria for HISS-06A and HISS-11A were calculated using historical data from wells previously at these locations (HISS-06 and HISS-11).

Ground-Water Monitoring Guideline = 2 x UCL_{95}

Total U monitoring guide = 30 µg/L.

--- The analyte was not detected in the historical database so a monitoring guideline was not developed.

Table F-2. ROD Monitoring Guidelines for Ground Water at the SLAPS and SLAPS VPs

Analyte Type	Soil COCs	B53W01D	B53W01S	B53W06S	B53W07D	B53W07S	B53W09S	B53W13S	B53W17S	B53W18S
Inorganics (µg/L)	**Antimony**	---	---	105	5.0	---	---	---	---	---
	Arsenic	170	---	---	150	140	---	---	---	3.6
	Barium	840	390	190	730	530	630	510	450	1,200
	Cadmium	---	---	---	---	---	---	---	8.8	---
	Chromium	7.2	15	47	5.6	11	9.6	9.1	7.0	51
	Molybdenum	---	---	22	4.0	4.4	14	3.2	21	28
	Nickel	---	30	16	12	5.2	83	38	5.2	910
	Selenium	---	---	---	4.0	5.2	700	790	140	---
	Thallium	---	8.0	---	7.4	---	---	7.0	---	---
	Total Uranium	30	30	30	30	30	30	30	30	30
	Vanadium	19	44	48	12	17	24	---	83	54
Radionuclides (pCi/L)	**Ra-226**	4.4	---	3.8	3.4	7.2	2.5	---	---	7.2
	Th-228	1.6	1.0	1.5	---	2.2	3.0	4.4	3.8	7.0
	Th-230	5.8	2.9	3.9	4.4	4.0	5.0	6.0	5.6	8.0
	Th-232	---	---	---	---	---	---	---	---	1.4
	U-234	3.4	8.2	66	3.6	11	18	13	5.4	4.5
	U-235	---	---	2.9	---	---	6.1	---	4.4	---
	U-238	2.7	2.7	57	4.6	8.2	13	10	4.2	3.4

Table F-2. ROD Monitoring Guidelines for Ground Water at the SLAPS and SLAPS VPs

Analyte Type	Soil COCs	B53W19S	MW31-98	MW32-98	PW35	PW36	PW42	PW43	PW44	PW45	PW46[a]
Inorganics (μg/L)	Antimony	---	---	---	---	---	---	---	---	---	---
	Arsenic	36	---	5.8	90	220	280	53	13	---	7.0
	Barium	510	1,300	700	3,300	1,500	670	260	260	610	250
	Cadmium	0.7	3.8	3.8	0.6	---	0.8	---	---	---	1.2
	Chromium	290	4.6	5.6	16	3.2	52	3.5	---	---	37
	Molybdenum	130	35	3.0	32	8.0	6.0	6.4	12	1,500	2.2
	Nickel	1,100	7.8	4.0	35	13	28	3.6	---	67	3.4
	Selenium	4.2	390	740	2.8	3.8	---	---	---	7,200	710
	Thallium	7.7	---	9.8	7.4	14	7.6	---	---	---	---
	Total Uranium	30	30	30	30	30	30	30	30	30	30
	Vanadium	36	110	54	35	13	12	3.1	---	---	67
Radionuclides (pCi/L)	Ra-226	1.4	3.4	1.6	8.0	2.0	4.0	6.1	1.8	2.4	22
	Th-228	5.2	4.6	1.4	2.6	2.6	1.6	2.4	3.4	2.5	2.1
	Th-230	6.0	4.0	4.0	4.1	3.6	3.4	2.6	12	5.8	60
	Th-232	2.2	---	0.4	2.3	---	---	---	---	---	7.0
	U-234	2.4	7.0	21	4.3	3.2	9.0	29	4.7	79	5,500
	U-235	---	5.9	9.4	---	---	---	2.2	---	3.0	290
	U-238	1.8	5.7	19	4.7	4.9	6.6	26	3.4	64	5,600

Notes:

[a] The ROD Evaluation Criteria for PW46 were calculated using historical data from a well previously at this location (PW38).

Ground-Water Monitoring Guideline = 2 x UCL_{95}

Total U monitoring guide = 30 μg/L.

--- The analyte was not detected in the historical database so a monitoring guideline was not developed.

APPENDIX G

DOSE ASSESSMENT ASSUMPTIONS

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A. Dose from the St. Louis Airport Site/St. Louis Airport Site Vicinity Properties to a Maximally Exposed Individual

A full-time employee business receptor was evaluated to determine the maximally exposed individual from the SLAPS, because the RA work conducted on the SLAPS VPs occurred in the vicinity of the receptor. The business receptor worked full-time outside of the facility, located approximately 500 m west-southwest of the center of the SLAPS Loadout area. Exposure time was 2,000 hours per year (250 days per year).

Gamma radiation and radon exposure measured at the SLAPS perimeter assumes that a hypothetical member of the public would be at the same location 24 hours per day, 365 days per year. However, 366 days were used for CY 2012 because of the leap year. Off-site dose to the nearest member of the public is dependent upon the member's proximity to the gamma source and amount of time spent at the affected site. A more realistic approach to project dose is to evaluate members of the public as either residence-based or off-site-worker-based receptors. A residence-based, off-site exposure assumes a 100 percent occupancy rate at a given location. No public areas or residences exist near the SLAPS; therefore, exposure to a residence-based receptor is greatly reduced due to the distance relative to the site. An off-site-worker exposure assumes that a worker's occupancy rate is 23 percent, based on 8 hours per day, 5 days per week, and 50 weeks per year. The off-site-worker-based receptor is a more realistic choice to represent the hypothetical maximally exposed individual because of the proximity of the receptor. A realistic assessment of dose can be performed using conservative assumptions of occupancy rate and distance from the source.

The following dose assessment is for a maximally exposed individual who works full-time (2,000 hours per year) at a location approximately 500 m west-southwest of the center of the SLAPS Loadout area.

1. Airborne Radioactive Particulates

EDE of <0.1 mrem/yr to the receptor was calculated by using activity fraction and air particulate monitoring data to determine a source term, and then using the USEPA CAP88-PC modeling code to calculate dose to the receptor at 500 m west-southwest of the center of the SLAPS Loadout area (SAIC 2013b). Details related to calculation of EDEs for the exposed receptors are presented in Appendix A.

2. External Gamma Pathway

Because station PA-1 was the closest to the receptor, the TLD results from this station were used for the dose calculations. Station PA-1 TLDs measured an annual exposure, above background, of 3 mrem/yr based on 8,760 hours of continuous exposure. The dose equivalent due to gamma exposure for the maximally exposed individual is estimated by assuming that the site approximates a line source with a source strength (H_1) that is the average of the TLD measurements between the source and the receptor (Cember 1996).

$$H_1 = 3 \text{ mrem/yr}$$

Based on a 100-percent occupancy rate, the exposure rate (H_2) to the receptor was calculated as follows:

$$H_2 = H_1 \times \frac{h_1}{h_2} * \frac{\tan^{-1}(L/h_2)}{\tan^{-1}(L/h_1)}$$

$$H_2 = 6.2E\text{-}04 \text{ mrem/yr}$$

where:

H_2 = exposure rate to the receptor (continuous exposure)

H_1 = exposure rate to TLDs

h_2 = distance from source to receptor = 500 m

h_1 = distance from source to TLDs = 1.6 m

L = average distance from centerline of the line source (H_1) to the end of the line source = 50 m

The actual dose to the maximally exposed individual, who is only present during a normal work year, is calculated as follows:

$$H_{MEI} = H_2 \times \frac{2{,}000 \text{ hours per work year}}{8{,}760 \text{ hours per total year}} = 1.0E\text{-}05 \text{ mrem/yr}$$

$$H_{MEI} = <0.1 \text{ mrem/yr}$$

3. Airborne Radon Pathway

The SLAPS ATDs measured an above background annual exposure of 0.03 pCi/L based on 8,760 hours of continuous exposure. Exposure to the receptor from radon (and progeny) was estimated using a dispersion factor (C_2) and the average ATD monitoring data (S_1) at the site perimeter between the source and the receptor (SAIC 2013c).

$$S_1 = 0.03 \text{ pCi/L}$$

The actual radon exposure dose to the hypothetical maximally exposed individual was calculated as follows:

$$S_{MEI} = S_1 \times F \times DCF \times T \times C_1 \times C_2$$

$$S_{MEI} = 0.03 \text{ pCi/L} \times 0.0005 \frac{\text{WL}}{\text{pCi/L}} \times 1{,}250 \frac{\text{mrem}}{\text{WLM}} \times \frac{2{,}000 \text{ hours}}{\text{year}} \times \frac{1 \text{ month}}{170 \text{ hours}} \times 0.0043 = 0.001 \text{ mrem/yr}$$

where:

S_{MEI} = Radon exposure to the hypothetical maximally exposed individual

S_1 = Fenceline average of ATD measurements between source and receptor

F = Equilibrium fraction of 0.05 WL per 100 pCi/L (DOE 1998)

DCF = Dose Conversion Factor (USEPA 1989b) = 1,250 mrem/working level month (WLM)

T = Exposure time = 2,000 hours/year

C_1 = Occupancy factor constant = 1 month per 170 hours

C_2 = Constant derived using CAP-88PC Version 2.0, the Lambert - St. Louis International Airport wind file (assuming a distance of 160 m), and an impacted surface area of 1,722 square meters (m^2). Calculation assumes a 1 curie (Ci)/year radon release rate and then ratios the concentrations at 1 m and 160 m to determine the constant.

WL = working level (concentration unit)

WLM = working level month (exposure unit)

4. Total Effective Dose Equivalent

$$TEDE = CEDE \text{ (airborne particulates)} + H_{MEI} \text{ (external gamma)} + S_{MEI} \text{ (airborne radon)}$$

$$TEDE = <0.1 \text{ mrem/yr} + <0.1 \text{ mrem/yr} + <0.1 \text{ mrem/yr} = <0.1 \text{ mrem/yr}$$

B. Dose from Coldwater Creek to a Maximally Exposed Individual

The following dose assessment is for a maximally exposed individual who is assumed to be a youth who spends time at Coldwater Creek for recreational purposes.

1. Contaminated Water Ingestion (SAIC 2013d)

The UCL_{95} values of the average contamination values measured in Coldwater Creek in 2012 at each monitoring station (Table G-1) were used to calculate the EDE to the receptor from an intake of contaminated water. Assumptions are as follows:

The receptor visits Coldwater Creek as a recreational user once every 2 weeks (26 visits per year) and the receptor drinks 2 L per day of contaminated water from the creek during each visit (USEPA 1989c).

The TEDE due to ingestion of surface water ($TEDE_w$) was calculated as follows:

$$TEDE_W = \Sigma\ (TEDE_{Tot\text{-}U}, TEDE_{Th\text{-}228}, TEDE_{Th\text{-}230}, TEDE_{Th\text{-}232}, TEDE_{Ra\text{-}226}, TEDE_{Ra\text{-}228})$$

$$TEDE_i = (UCL_{95}) \text{ pCi/L} \times 2.0 \text{ L per day} \times 26 \text{ days per year} \times DCF \text{ mrem/pCi}$$

Table G-1. UCL_{95} Values for Radionuclides for CY 2012

Radionuclides	UCL_{95} Concentration	Unit
Ra-226	1.79	pCi/L
Th-228	0.49	pCi/L
Th-230	0.63	pCi/L
Th-232	0.37	pCi/L
Total U	2.06	pCi/L

DCFs (USEPA 1989b) for radionuclides present in Coldwater Creek surface water are presented in Table G-2.

Table G-2. Radionuclide Dose Conversion Factor for CY 2012

Radionuclides	DCF	Unit
Ra-226	1.33E-03	mrem/pCi
Th-228	3.96E-04	mrem/pCi
Th-230	5.48E-04	mrem/pCi
Th-232	2.73E-03	mrem/pCi
Total U	2.50E-05	mrem/pCi

The USEPA's software ProUCL Version 3.0 was used to determine the UCL_{95} values for radiological contaminants present in Coldwater Creek (SAIC 2013d). The UCL_{95} values are presented in Table G-1.

Therefore:

$$TEDE_{Ra\text{-}226} = 1.79 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 1.33\text{E-}03 \text{ mrem/pCi}$$
$$= 1.24\text{E-}01 \text{ mrem/yr}$$

$$TEDE_{Th\text{-}228} = 0.49 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 3.96\text{E-}04 \text{ mrem/pCi}$$
$$= 1.01\text{E-}02 \text{ mrem/yr}$$

$$TEDE_{Th\text{-}230} = 0.63 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 5.48\text{E-}04\text{mrem/pCi}$$
$$= 1.78\text{E-}02 \text{ mrem/yr}$$

$$TEDE_{Th\text{-}232} = 0.37 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 2.73\text{E-}3 \text{ mrem/pCi}$$
$$= 5.20\text{E-}02 \text{ mrem/yr}$$

$$TEDE_{Tot\text{-}U} = 2.06 \text{ pCi/L} \times 2.0 \text{ L/day} \times 26 \text{ days/year} \times 2.50\text{E-}05 \text{ mrem/pCi}$$
$$= 2.68\text{E-}03 \text{ mrem/yr}$$

$$TEDE_{W} = 2.06\text{E-}01 \text{ mrem/yr}$$

2. Contaminated Sediment Ingestion (SAIC 2013d)

The UCL_{95} values of the average contamination values measured in Coldwater Creek in 2012 at each monitoring station (Table G-3) were used to calculate the EDE to the receptor from an intake of contaminated sediment. Assumptions are as follows:

The receptor visits Coldwater Creek as a recreational user once every 2 weeks (26 visits per year). The receptor ingests 50 mg/day of contaminated sediment from the creek during each visit (USEPA 1989c).

The TEDE due to ingestion of contaminated sediment ($TEDE_S$) was calculated as follows:

$$TEDE_S = \Sigma\ (TEDE_{Tot\text{-}U}, TEDE_{Th\text{-}228}, TEDE_{Th\text{-}230}, TEDE_{Th\text{-}232}, TEDE_{Ra\text{-}226}, TEDE_{Ra\text{-}228})$$

$$\mathit{TEDE_i} = (UCL_{95}) \text{ picoCuries per gram (pCi/g)} \times 0.05 \text{ gram (g)/day} \times 26 \text{ days per year} \times \text{DCF mrem/pCi}$$

Table G-3. UCL_{95} Values for Radionuclide for CY 2012

Radionuclides	UCL_{95} Concentration	Unit
Ra-226	1.25	pCi/g
Ra-228	0.91	pCi/g
Th-228	1.46	pCi/g
Th-230	3.20	pCi/g
Th-232	1.20	pCi/g
Total U	3.07	pCi/g

DCFs (USEPA 1989b) for radionuclides present in Coldwater Creek sediment are presented in Table G-4.

Table G-4. Radionuclide Dose Conversion Factors for CY 2012

Radionuclides	DCF	Unit
Ra-226	1.33E-3	mrem/pCi
Ra-228	1.44E-3	mrem/pCi
Th-228	3.96E-4	mrem/pCi
Th-230	5.48E-4	mrem/pCi
Th-232	2.73E-3	mrem/pCi
Total U	2.50E-5	mrem/pCi

The USEPA's software ProUCL Version 3.0 was used to determine UCL_{95} values for radiological contaminants present in Coldwater Creek sediment (SAIC 2013b). The UCL_{95} values are presented in Table G-3.

Therefore:

$$TEDE_{Ra\text{-}226} = 1.25\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 1.33E\text{-}3\ mrem/pCi$$
$$= 2.16E\text{-}03\ mrem/yr$$

$$TEDE_{Ra\text{-}228} = 0.91\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 1.44E\text{-}3\ mrem/pCi$$
$$= 1.70E\text{-}03\ mrem/yr$$

$$TEDE_{Th\text{-}228} = 1.46\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 3.96E\text{-}4\ mrem/pCi$$
$$= 7.53E\text{-}04\ mrem/yr$$

$$TEDE_{Th\text{-}230} = 3.20\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 5.48E\text{-}4\ mrem/pCi$$
$$= 2.28E\text{-}03\ mrem/yr$$

$$TEDE_{Th\text{-}232} = 1.20\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 2.73E\text{-}3\ mrem/pCi$$
$$= 4.25E\text{-}03\ mrem/yr$$

$$TEDE_{Tot\text{-}U} = 3.07\ pCi/g \times 0.05\ g/day \times 26\ days/year \times 2.50E\text{-}5\ mrem/pCi$$
$$= 9.97E\text{-}05\ mrem/yr$$

$$TEDE_S = 1.12E\text{-}02\ mrem/yr$$

3. <u>Total Effective Dose Equivalent</u>

$$TEDE = TEDE_W + TEDE_S$$

$$TEDE = 2.06E\text{-}01\ mrem/yr + 1.12E\text{-}02\ mrem/yr = 0.2\ mrem/yr$$

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