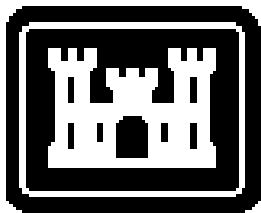

REVISION 0

ENVIRONMENTAL MONITORING IMPLEMENTATION PLAN FOR THE NORTH ST. LOUIS COUNTY SITES FOR CALENDAR YEAR 2025

ST. LOUIS, MISSOURI

DECEMBER 31, 2024



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



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DECEMBER 31, 2024

prepared by

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

with assistance from

Leidos, Inc.
under Contract No. W912P923C0012

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ACRONYMS AND ABBREVIATIONS

Ac	actinium
AEC	U.S. Atomic Energy Commission
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
ATD	alpha track detector
BMP	best management practice
BOD	biological oxygen demand
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
<i>CFR</i>	<i>Code of Federal Regulations</i>
COC	contaminant of concern
COD	chemical oxygen demand
<i>CSR</i>	<i>Code of State Regulations</i>
CWC	Coldwater Creek
CY	calendar year
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EDD	external dose dosimeter
ELAP	Environmental Laboratory Accreditation Program
EMDAR	Environmental Monitoring Data and Analysis Report
EMG	<i>Environmental Monitoring Guide for the St. Louis Sites</i>
EMICY	Environmental Monitoring Implementation Calendar Year
EMP	Environmental Monitoring Program
FUSRAP	Formerly Utilized Sites Remedial Action Program
Futura	Futura Coatings Company
HISS	Hazelwood Interim Storage Site
HZ	hydrostratigraphic zone
IA	investigation area
IDW	investigation-derived waste
Mallinckrodt	Mallinckrodt LLC
MCL	maximum contaminant level
MDNR	Missouri Department of Natural Resources
MSD	Metropolitan St. Louis Sewer District
NC	North St. Louis County
NCP	National Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
Pa	protactinium
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control

ACRONYMS AND ABBREVIATIONS (Continued)

Ra	radium
RA	remedial action
RAC	remedial action contractor
RCRA	Resource Conservation and Recovery Act
RG	remediation goal
Rn	radon
ROD	<i>Record of Decision for the North St. Louis County Sites</i>
SAG	<i>Sampling and Analysis Guide for the St. Louis Sites</i>
SLAPS	St. Louis Airport Site
SLDS	St. Louis Downtown Site
SLS	St. Louis Sites
SOR	sum of ratios (unitless)
SSA	soil staging area
TEDE	total effective dose equivalent
Th	thorium
TPH	total petroleum hydrocarbons
TRRA	Terminal Railroad Association
TSS	total suspended solids
U	uranium
UCL ₉₅	95 percent upper confidence limit
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UUUE	unlimited use and unrestricted exposure
VP	vicinity property

UNIT ABBREVIATIONS

Both English and metric units are used in this report. The units used in a specific situation are based on common unit usage or regulatory language (e.g., depths are given in feet, and areas are given in square meters). Units included in the following list are not defined at first use in this report.

$\mu\text{Ci/mL}$	microcurie(s) per milliliter
$\mu\text{g/L}$	microgram(s) per liter
ft	foot/feet
ft^3	cubic foot/feet
g	gram(s)
L	liter(s)
mCi	millicurie(s)
mgd	million gallons per day
mg/L	milligram(s) per liter
mL/L/hour	milliliter(s) per liter per hour
mrem	millirem
NTU	nephelometric turbidity unit(s)
pCi/L	picocurie(s) per liter
$\text{pCi/m}^2/\text{second}$	picocuries per square meter per second
WL	working level(s)

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1.0 INTRODUCTION

This Environmental Monitoring Implementation Calendar Year (EMICY) plan for calendar year (CY) 2025 applies to the North St. Louis County (NC) Sites within the Formerly Utilized Sites Remedial Action Program (FUSRAP). A schematic representation of the FUSRAP St. Louis Sites (SLS) and the overall organization of the NC Sites are shown on Figure 1-1. The NC Sites consist of the St. Louis Airport Site (SLAPS), its associated vicinity properties (VPs), and the Latty Avenue Properties (Figure 1-2). The Latty Avenue Properties include the Futura Coatings Company (Futura), the Hazelwood Interim Storage Site (HISS), and the Latty Avenue VPs (Figure 1-3).

The FUSRAP was initiated in 1974 by the U.S. Atomic Energy Commission (AEC), the predecessor to the U.S. Department of Energy (DOE). The FUSRAP was transferred to the U.S. Army Corps of Engineers (USACE) on October 13, 1997. The USACE is responsible for the management and execution of the FUSRAP to clean up sites used in the nation's early atomic energy program. One element of the FUSRAP mission is the environmental monitoring of sites at which response actions either are being implemented or have been completed, but at which contaminants remain onsite that exceed *Record of Decision for the North St. Louis County Sites* (ROD) (USACE 2005) remediation goals (RGs) for unlimited use and unrestricted exposure (UUUE).

Environmental monitoring is conducted to support assessment of the effectiveness of the remedial action (RA) in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 5-year reviews. Five-year reviews are required under the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan (NCP), at sites where hazardous substances, pollutants, or contaminants remain above ROD RGs for UUUE. Environmental monitoring serves as a critical tool to evaluate potential future migration of residual contaminants, whether as a component of RAs or as a best management practice (BMP).

This document serves as a component of an integrated approach to collecting environmental data. These data are collected to ensure compliance with the ROD (USACE 2005) goals and applicable or relevant and appropriate requirements (ARARs). As a result of promulgation of new regulations, issuance of permits, meeting of substantive requirements, and/or the implementation of RAs; monitoring requirements and data objectives may change. Accordingly, program-level requirements with respect to field sampling procedures, sample management requirements, analytical protocols, and quality assurance (QA)/quality control (QC) activities that are unlikely to change are specified in an upper-tier document titled *Sampling and Analysis Guide for the St. Louis Sites* (SAG) (USACE 2000). The *Environmental Monitoring Guide for the St. Louis Sites* (EMG) (USACE 1999), currently being updated, describes the overall objectives, program structure, media to be monitored, and program requirements of the Environmental Monitoring Program (EMP).

Annual EMICY plans are issued under the EMG to address changing monitoring objectives and to specifically identify sampling locations, frequencies, monitoring parameters, and criteria for evaluation of the resultant data specific for periodic sampling activities for the subject year. Non-periodic sampling activities such as soil sampling to define contamination extent for design purposes or to verify compliance with cleanup objectives or other special studies are specified in other implementation plans throughout the year. Excavation water and stormwater data obtained from the monitoring described in the EMICY are reported to the U.S. Environmental Protection Agency (USEPA) Region 7 and the Missouri Department of Natural Resources (MDNR) in quarterly reports. The remaining data, along with an evaluation of the data obtained from monitoring under the EMICY during a CY, are provided in an annual [*Environmental Monitoring Data and Analysis Report*](#) (EMDAR) for each CY.

Since completion of the EMICY for CY 2024 (USACE 2023), four outdoor external dose dosimeter (EDD) and alpha track detector (ATD) monitoring locations (i.e., PA-7 through PA-10) were established around the four corners of the newly established soil staging area (SSA) on investigation area (IA)-09 Ballfields.

Daily surface water sampling events at Coldwater Creek (CWC) were reduced to a weekly and now a monthly frequency. These samples will be periodically collected from temporarily established or existing stations downstream from active RAs that meet the access conditions for sampling on days when contaminated soil RAs being conducted within the CWC corridor have the potential to affect water quality. One Metropolitan St. Louis Sewer District (MSD) excavation water discharge location was added near the RA on the James S McDonnell Boulevard and the use of one location near the intersection of James S McDonnell Boulevard and Banshee Road was removed. Additionally, Outfall 002 (i.e., PN02) was removed as part of the RAs in the area.

Comprehensive quarterly groundwater sampling events may transition to semiannual groundwater sampling at all or a portion of the wells in the network for the Latty Avenue Properties, the SLAPS, and the SLAPS VPs based on a review of the available data in comparison to the monitoring guidelines and goals established in the ROD.

The USACE/contractor will continue to inventory and inspect the CWC parcels with known contamination, documenting the contamination status (e.g., surface, subsurface, etc.) and site configuration conditions (e.g., cover material [e.g., vegetation, pavement, riprap, etc.], adjacent structures, sign integrity, access agreements, etc.) with a checklist, maps, and digital images. The completed inspection checklists and inventory will be compiled and documented on a quarterly basis. No other changes to the EMP or environmental monitoring are planned for CY 2025.

The remainder of this section contains a summary description of the contents of this document. Section 2.0 contains guidelines derived from the ROD and various environmental regulations that will be used for assessment of the data obtained under this EMICY. Section 3.0 contains the various types and locations of monitoring to be conducted, along with supporting QA/QC requirements. Section 4.0 references the SAG procedures necessary to fulfill the requirements of this EMICY, including field-sampling procedures, sample management requirements, sample packaging and shipping requirements, management of investigation-derived waste (IDW), and analytical protocols (USACE 2000).

2.0 OBJECTIVES AND EVALUATION GUIDELINES FOR THE ENVIRONMENTAL MONITORING PROGRAM FOR CY 2025

2.1 PROGRAM OBJECTIVES FOR CY 2025

The objectives for the EMP during CY 2025 are identified as follows.

- Conduct BMP monitoring to obtain data for impact evaluations relative to guidelines derived from environmental regulations.
- Conduct periodic monitoring, as required, to meet substantive requirements or permit or ARAR conditions.
- Perform trend analyses, as required, to determine effects of RAs on surface water and groundwater.

To fulfill these objectives, Section 3.0 identifies sampling locations and frequencies for various environmental media based on ARARs, permit conditions, site characteristics, risk assessment considerations, and other site factors. Such sampling locations can include the area of contamination (AOC), points of compliance at the AOC boundary, receptor areas, off-site unaffected areas, critical receptors, or migration pathways. Similarly, the monitoring parameters identified in Section 3.0 were selected from permit conditions, best professional judgment based on historical site studies, and the ROD (USACE 2005).

2.2 EVALUATION GUIDELINES FOR ENVIRONMENTAL MONITORING DATA

Data acquired during CY 2025 will be evaluated with respect to ARARs, permit conditions, guidelines derived from environmental regulations, and environmental documents (i.e., the ROD).

2.2.1 Guidelines for Site Radiological Data

Outdoor and indoor air monitoring will be conducted under this EMICY as a BMP or to meet ARAR commitments. Site outdoor radiological monitoring is appropriate in the vicinity of excavation and loadout areas (e.g., VPs) and/or at areas accessible to members of the public. Indoor air monitoring (i.e., radon) is appropriate for occupied or habitable structures at the Futura property at which radium (Ra)-226 levels in soils under structures remain at levels above the RGs established in the ROD. The following subsections describe the monitoring that will be conducted to demonstrate compliance.

Title 40 Code of Federal Regulations 61, Subpart I

Sampling results from outdoor airborne particulate monitoring will be evaluated with respect to regulatory guidelines from 40 *Code of Federal Regulations (CFR)* 61. In accordance with 40 *CFR* 61.102(a), the dose from radioactive airborne particulates (excluding radon) to the hypothetical maximally exposed member of the public is not to exceed 10 mrem per year. This value applies to the critical receptor receiving the highest dose as determined by modeling and/or monitoring that considers inputs such as wind direction and duration of human occupancy.

Title 10 Code of Federal Regulations 20.1301

Sampling results from outdoor airborne particulate, external gamma, and outdoor radon monitoring will be evaluated with respect to the regulatory guideline from 10 *CFR* 20. Although this is not an ARAR, the evaluation is conducted as a BMP to provide assurance that actions conducted in accordance with the ROD are protective of the public. Exposure to the public from FUSRAP RA operating activities is limited to 100 mrem per year excluding background, from all

pathways by 10 *CFR* 20. Guidance on the use of monitoring data to demonstrate compliance with the 100 mrem per year standard when considering all pathways is contained in 10 *CFR* 20.

Title 40 Code of Federal Regulations 192.02(b)

Sampling results from outdoor radon monitoring will be evaluated with respect to the regulatory guideline from 40 *CFR* 192.02(b). In accordance with 40 *CFR* 192, control of residual radioactive materials and constituents shall be designed to provide reasonable assurance that release of radon (Rn)-222 from residual radioactive material to the atmosphere will not exceed an average release rate of 20 pCi/m²/second or increase the annual average concentration of Rn-222 in air at or above any location outside the site by more than 0.5 pCi/L.

Title 40 Code of Federal Regulations 192.12(b)

Sampling results from indoor radon monitoring within occupied structures on the Futura property will be evaluated with respect to the regulatory guideline from 40 *CFR* 192.12(b). In accordance with 40 *CFR* 192.12(b), reasonable effort shall be made to achieve an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WLs in occupied or habitable buildings.

Lists of regulatory commitments and a general description of how the commitments will be implemented are provided in Tables 2-1 through 2-4.

Table 2-1. Guidelines for Outdoor Air, Indoor Air and Direct Radiation Monitoring Data

Media	Parameter	Regulatory Based Guideline	Type of Monitoring
Outdoor Air	Radiation Dose to Public	Total dose to a member of the public from all pathways ≤100 mrem/year. Airborne particulate dose to a member of the public ≤10 mrem/year (exclusive of radon).	Radon concentrations (with ATDs) and direct gamma radiation dose rates (with EDDs) around the IA-09 SSA, the loadout pad area for the SLAPS, and along the railroad tracks adjacent to Futura on VP-40A to determine dose to a member of the public (i.e., reasonable maximum exposed receptor). Air particulate concentrations (filtered air samples) at excavation perimeters and loadout areas accessible to members of the public at the SLAPS, the SLAPS VPs, and the Latty Avenue Properties.
Indoor Air	Radon	Radon decay chain isotopes concentration (or equivalent) ≤0.02 WL.	Radon measurements (with ATDs) within the main structures on the Futura property.

Table 2-2. Summary of National Emission Standards for Hazardous Air Pollutants (NESHAP) Air Emissions Regulation

Regulation: NESHAP Air Emissions		
Regulation	Description/Standard	Implementation
40 <i>CFR</i> 61, Subpart I (ARAR in ROD [USACE 2005])	Radionuclide emissions of ambient air particulates from federal facilities other than U.S. Nuclear Regulatory Commission (NRC) licensees shall not exceed those amounts that would cause any member of the public to receive an effective dose equivalent in excess of 10 mrem/year exclusive of radon.	Compliance with this standard will be demonstrated through measurement of radionuclide air particulate concentrations at site or excavation area perimeters and the use of the USEPA computer code CAP88PC and/or measurement of radionuclide air concentrations at critical receptor locations in accordance with 40 <i>CFR</i> 61.107(b). USEPA concurrence is required to use environmental measurements to show compliance at receptor locations.

Table 2-3. Summary of Uranium Mill Tailings Radiation Control Act (UMTRCA) Radon Emissions Regulation

Regulation: UMTRCA Radon Emissions		
Regulation	Description/Standard	Implementation
40 <i>CFR</i> 192.02(b) (ARAR in ROD [USACE 2005])	Outdoor radon measurements to ensure the average annual concentration is ≤ 0.5 pCi/L at or above the site.	Outdoor radon monitoring will be performed around the loadout pad area for the SLAPS and the VP-40(A) fence line adjacent to Futura using radon ATDs as described in 40 <i>CFR</i> 61 Appendix B, Method 114, Method A-7.
40 <i>CFR</i> 192.12(b) (ARAR in ROD [USACE 2005])	Indoor radon measurements to ensure the average annual (or equivalent) radon decay product concentration (including background) do not exceed 0.02 WL.	Indoor radon monitoring will be conducted in the main structures on the Futura property using radon ATDs as described in 40 <i>CFR</i> 61, Appendix B, Method 114, Method A-7.

Table 2-4. Summary of Regulation for Dose Limits to Individual Members of the Public

Regulation: 10 <i>CFR</i> 20.1301 Dose Limits to Individual Members of the Public		
Regulation	Description/Standard	Implementation
10 <i>CFR</i> 20.1301 (BMP)	Total dose to individual members of the public shall not exceed 100 mrem/year, exclusive from the dose contributions from background radiation.	Compliance with this standard will be demonstrated using a combination of EDDs, ATDs, and air samples for particulate radionuclides. Radon concentrations (with ATDs) and direct gamma radiation dose rates (with EDDs) will be collected around the SLAPS loadout pad area and along the railroad tracks adjacent to Futura on VP-40A. At the SLAPS and the SLAPS VPs, air particulate concentrations (filtered air samples) will be collected at excavation perimeters and loadout areas accessible to members of the public. The summation of the doses calculated from the results of monitoring with EDDs, ATDs, and particulate air samples, as applicable, will be used to demonstrate compliance with the 100 mrem/year criterion. The dose contribution from water pathways is negligible and is not considered when calculating total effective dose equivalent (TEDE) to the critical receptor. Dose from the monitoring locations to critical receptors will be modeled to maximally exposed receptor locations in accordance with 10 <i>CFR</i> 20.1302(b)(1) to demonstrate compliance with the dose limit in 10 <i>CFR</i> 20.1301.

2.2.2 Guidelines for Excavation Water Data and Stormwater Data

The MSD has issued discharge authorization letters for the SLAPS and NC Sites that establish discharge-limit-based criteria for excavation water (MSD 2001, 2005, 2006, 2008, 2010, 2012, 2014, 2016, 2018a, 2020a, 2022, 2024a). The pollutants addressed in the MSD letters for the NC Sites are identified in Table 2-5. The pollutants addressed in the National Pollutant Discharge Elimination System (NPDES) permit equivalent for the SLAPS for stormwater will be applied at all NC Sites and are identified in Table 2-6. These discharge limits will be used as guidelines for excavation water and stormwater monitoring data obtained under this EMICY and reported in the annual EMDAR. For cases in which the governing authorities have not provided discharge limits for the NC Sites radiological contaminants of concern (COCs), the 10 *CFR* 20, Appendix B, values have been provided. Additionally, the 10 *CFR* 20, Appendix B, values are used to calculate the sum of ratios (SOR) value when sampling for discharge and aid in the establishment of water management protocols. The MDNR has also issued a permit equivalent outlining limits for the stormwater outfalls at the SLAPS (MDNR 1998). The ROD acknowledged effluent limits established in the permit

equivalent as ARARs. Copies of the MSD discharge authorization letters and the MDNR NPDES permit equivalent are located in Appendix A of this EMICY.

Table 2-5. MSD Discharge Limits and 10 CFR 20, Appendix B, Values

Constituent	Discharge-Limit-Based Criteria MSD ^a	10 CFR 20, Appendix B, Table 3, Sewer Release Values
Radiochemical Parameters		
Ra-226 ^b	10 pCi/L	600 pCi/L
Ra-228 ^b	30 pCi/L	600 pCi/L
Thorium (Th)-228 ^b	2,000 pCi/L	2,000 pCi/L
Th-230 ^b	1,000 pCi/L	1,000 pCi/L
Th-232	Not Required	300 pCi/L
Uranium (U)-234	3,000 pCi/L	3,000 pCi/L
U-235	3,000 pCi/L	3,000 pCi/L
U-238	3,000 pCi/L	3,000 pCi/L
Total U ^b	No Value Listed	3,000 pCi/L
Gross Alpha (raw water)	3,000 pCi/L	No Value Listed
Gross Beta	No Value Listed	No Value Listed
Gross Alpha (Total Suspended Solids [TSS] filtrate)	No Value Listed	No Value Listed
SOR	1.0	1.0
Total Activity	50 mCi per year	No Value Listed
Metals Parameters		
Barium	10 mg/L	No Value Listed
Lead	0.4 mg/L	No Value Listed
Selenium ^c	0.2 mg/L	No Value Listed
Other Parameters		
Biological Oxygen Demand (BOD) ^d	300 mg/L	No Value Listed
Chemical Oxygen Demand (COD) ^d	600 mg/L	No Value Listed
TSS	No Value Listed	No Value Listed
Total Volume Discharged	300,000 gallons/24-hour period	No Value Listed

^a MSD authorization letter dated 07/23/01 and as modified in MSD letters issued 02/10/05, 06/19/06, 05/22/08, 05/10/10, 05/24/12, 06/23/14, 07/18/16, 06/11/18, 07/16/20, 06/07/22, and 07/22/24. The first two batches in each new IA will require a full suite analysis. Subsequent batches must be analyzed and shown to meet applicable limits for total U, gross alpha, gross beta, and TSS prior to discharge (MSD 2001, 2005, 2006, 2008, 2010, 2012, 2014, 2016, 2018a, 2020a, 2022, 2024a).

^b These evaluation parameters are used to calculate the SOR value when sampling for discharge and aids in establishing water management protocols.

^c Under certain conditions with a selenium concentration greater than 0.2 mg/L, a mass limit of 76 g per day is imposed. This is a special grant from MSD. Any time the selenium levels are greater than 0.2 mg/L, the USACE has the option to discharge at a lower rate. For example, instead of discharging 100,000 gallons of water with selenium concentrations at 0.2 mg/L, the USACE can discharge 50,000 gallons of water at 0.4 mg/L, as long as cumulative discharge of selenium remains below the 76 g per day (MSD 2005).

^d MSD surcharges apply for BOD concentration greater than 300 mg/L and COD concentration greater than 600 mg/L.

Table 2-6. NPDES Discharge Limits and 10 CFR 20, Appendix B, Values

Constituent	Discharge-Limit-Based Criteria NPDES ^a	10 CFR 20, Appendix B, Table 2, Column 2, Effluent Values
Radiochemical Parameters		
Ra-226 ^b	Not Required	60 pCi/L
Ra-228 ^b	Not Required	60 pCi/L
Total Ra	Monitor Only	No Value Listed
Th-228 ^b	Not Required	200 pCi/L
Th-230 ^b	Not Required	100 pCi/L
Th-232 ^b	Not Required	30 pCi/L
Total Th	Monitor Only	No Value Listed
U-234	Not Required	300 pCi/L
U-235	Not Required	300 pCi/L

Table 2-6. NPDES Discharge Limits and 10 CFR 20, Appendix B, Values (Continued)

Constituent	Discharge-Limit-Based Criteria NPDES ^a	10 CFR 20, Appendix B, Table 2, Column 2, Effluent Values
Radiochemical Parameters (Continued)		
U-238	Not Required	300 pCi/L
Total U ^b	Monitor Only	300 pCi/L
Gross Alpha	Monitor Only	No Value Listed
Gross Beta	Monitor Only	No Value Listed
Protactinium (Pa)-231	Monitor Only	6 pCi/L
Actinium (Ac)-227	Monitor Only	5 pCi/L
Radon	Monitor Only	No Value Listed
Metals Parameters		
Arsenic	0.1 mg/L	No Value Listed
Cadmium	0.094 mg/L	No Value Listed
Chromium	0.28 mg/L	No Value Listed
Miscellaneous Parameters		
COD ^c	90 mg/L	No Value Listed
Oil and Grease	10 mg/L ^c	No Value Listed
Total Petroleum Hydrocarbons (TPH)	10 mg/L ^c	No Value Listed
pH ^d	6.0-9.0	No Value Listed
Settleable Solids	1.0 mL/L/hour ^c	No Value Listed
Polychlorinated Biphenyls (PCBs)	<0.5 µg/L	No Value Listed

^a SLAPS - MDNR NPDES ARAR document letter from MDNR to the USACE dated 10/02/98 (MDNR 1998).

^b These evaluation parameters are used to calculate the SOR value when sampling for discharge and aids in establishing water management protocols.

^c Sampled annually.

^d Monitoring only requirement for NPDES or equivalent.

^e Monthly Average.

2.2.3 Guidelines for Coldwater Creek Surface Water and Sediment Data

Surface water and sediment data collected from CWC under this EMICY will be evaluated relative to historical sample results obtained at each station. The ROD states that the maximum contaminant level (MCL) for total uranium (U) of 30 µg/L may be used as a monitoring guide for surface water. In addition, the ROD established sediment RGs for Ra-226, thorium (Th)-230, and U-238, and these criteria will be used in evaluating CWC sediment. A trend analysis will then be performed at each station with the data collected to date to determine the effects of the RA on surface water and sediment in CWC. This trend analysis, along with the sample results, will be reported in the annual EMDAR.

2.2.4 Guidelines for Groundwater Data

The ROD identifies two types of monitoring guidelines: (1) response-action monitoring guidelines and (2) a total-U monitoring guide (which is used for both response-action and long-term monitoring). The ROD guideline for response-action monitoring is two times the 95 percent upper confidence limit (UCL₉₅) of the mean, based on historical concentrations of the analyte in a particular well before soil RAs were initiated under the ROD. The total-U monitoring guide is defined in the ROD to be equal to the total-U MCL of 30 µg/L (USACE 2005).

Response-action monitoring of hydrostratigraphic zone (HZ)-A and Unit 4 of HZ-C (as a surrogate for HZ-E) is conducted to ensure that the soil RA does not significantly degrade current groundwater conditions. A significantly degraded groundwater condition requires all of the following.

- Soil COC concentrations have statistically increased in groundwater (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 UCL₉₅ of the mean (based on the historical concentration before RA) for a period of 12 months.

- The groundwater from the degraded well (HZ-A wells only) is close enough to impact CWC.
- A significant degrading of CWC surface water is anticipated.

Long-term monitoring of groundwater (HZ-A only) will be conducted for inaccessible areas where soil contaminants remain at levels above the RGs (e.g., at the Futura buildings) to ensure protectiveness of the final remedy and to verify that groundwater conditions do not degrade. In the EMDAR for CY 2025, the NC wells will be evaluated to identify any sustained soil COC concentrations above the respective monitoring guideline. If groundwater monitoring indicates the presence of soil COCs at significantly increased concentrations and total U significantly above 30 µg/L, and if significant degrading of CWC surface water is anticipated, an evaluation of potential response actions would be conducted.

A trend analysis, such as the Mann-Kendall Trend Test, will be performed on wells that meet certain conditions based on their current and historical data to determine if the soil RA has any significant effects on groundwater. The conditions are met for a trend analysis for those wells at which an analyte exceeded the ROD guidelines at least once during the current CY and sufficient data were available to evaluate trends. The data and results of the trend analyses will be reported in the annual EMDAR.

3.0 ENVIRONMENTAL MONITORING ACTIVITIES FOR CY 2025

This section describes the periodic sampling and analysis selected for CY 2025 to achieve the objectives of the EMP, including the monitoring locations, frequencies, and analytes of concern. These activities will be implemented in conjunction with the program objectives defined in the EMG and program protocols described in the SAG (USACE 2000). Details of the specific sampling and analytical protocols necessary for field implementation are provided in the SAG. Characterization efforts, monitoring to support treatability studies, and RA confirmation sampling are considered non-periodic monitoring activities. Non-periodic monitoring activities are outside the scope of the EMICY and are implemented through issuance of work descriptions or other implementation plans and are not described herein.

3.1 AIR MONITORING AND DIRECT GAMMA RADIATION MONITORING

3.1.1 Rationales and Objectives for Air and Direct Gamma Radiation Monitoring

Objectives for air and direct gamma radiation monitoring are identified as follows.

- Provide surveillance of public exposure routes through sampling and analysis.
- Verify compliance with regulations.
- Provide indication and methods to quantify the release of radioactive materials from the site.
- Characterize trends in environmental radiation measurements, especially as they are affected by site RAs.

Measurement objectives to meet regulatory requirements are identified as follows.

- Calculate the total effective dose equivalent (TEDE) to the hypothetical maximally exposed members of the public from all complete and applicable pathways.
- Calculate the effective dose equivalent from airborne particulate emissions (exclusive of radon) to the hypothetical maximally exposed member of the public.
- Monitor outdoor radon concentrations at the loadout and Futura fence line.
- Determine indoor radon decay chain isotopes concentrations (or equivalent) in occupied or habitable buildings (e.g., Futura buildings) located on soils exceeding RGs for Ra-226.
- Determine background values for the parameters of concern at off-site locations.

EDDs, ATDs, and particulate air filters will be used in various combinations to monitor gamma exposure levels, radon, and airborne particulate radionuclide emissions (exclusive of radon), respectively. Data from these measurements will be converted into a TEDE. In compliance with regulatory requirements, an annual National Emission Standards for Hazardous Air Pollutants (NESHAP) report will be submitted to the USEPA.

3.1.2 Monitoring Locations

Monitoring locations for EDDs and ATDs at the Latty Avenue Properties and VP-40A are shown on Figure 3-1. The EDD and ATD monitoring locations for the SLAPS are shown on Figure 3-2. Four outdoor EDD and ATD monitoring locations (i.e., PA-7 through PA-10) were established around the four corners of the SSA on IA-09 in June of CY 2024. The location of the SLS background gamma radiation, radon, and particulate air sampling stations are shown on Figure 3-3.

The type, frequency, and location of air particulate, radon, and gamma radiation monitoring are identified in Table 3-1. The SLS background sampling results are assumed to be representative of the entire St. Louis metropolitan area including the NC Sites.

Table 3-1. Air Particulate, Radon, and Gamma Radiation Monitoring

Site	Parameters	Media/ Sample Type	Number of Monitoring Locations	Frequency	Driver/Purpose ^a
SLAPS	External gamma radiation	EDD	4	Quarterly	EMP – public exposure
	Radon and decay chain isotopes	ATD	4	Semi-annually	EMP – public exposure
	Particulate radionuclides	Filter	Varies ^b	During active loadout	EMP – NESHAP/public exposure
SLAPS VPs	External gamma radiation	EDD	4	Quarterly	EMP – public exposure
	Radon and decay chain isotopes	ATD	4	Semi-annually	EMP – public exposure
	Particulate radionuclides	Filter	Varies ^b	During active excavations and loadout	EMP – NESHAP/public exposure
Latty Avenue Properties	Particulate radionuclides	Filter	Varies ^b	During active excavations and loadout	EMP – NESHAP/public exposure
Futura Buildings	Radon decay chain isotopes (or equivalent)	ATD	13	Semi-annually	EMP – UMTRCA/public exposure
VP-40A	External gamma radiation	EDD	2	Quarterly	EMP – public exposure
	Radon and decay chain isotopes	ATD	3	Semi-annually	EMP – public exposure
Background	External gamma radiation	EDD	1	Quarterly	EMP – public exposure
	Radon and decay chain isotopes	ATD	1	Semi-annually	EMP – public exposure
	Particulate radionuclides	Filter	1	Weekly	EMP – NESHAP/public exposure

^a Public exposure monitoring requirements: 40 *CFR* 61, Subpart I; 10 *CFR* 20.1301; 40 *CFR* 192.12(b). Monitoring location levels and/or concentrations are used to calculate TEDE to the hypothetical maximally exposed critical receptor from the site.

^b The environmental remedial action contractor (RAC) conducts particulate air sampling at appropriate locations around active excavations and loadout areas. These data are used for NESHAP and public exposure evaluations.

External Gamma Monitoring

The EDDs will be used to measure direct gamma exposure from background and residual radioactivity. The EDDs will be located at the four corners of the SSA on IA-09, SLAPS loadout area perimeter, and along the railroad tracks adjacent to Futura on VP-40A. The QC EDDs will include shipment blanks (to evaluate the exposure received in transit) and duplicate EDDs to evaluate measurement (field) precision.

The EDD locations at the SLAPS will be relatively evenly spaced around the loadout pad area. EDD locations at the IA-09 SSA will be positioned at each of the four corners. EDD locations at VP-40A are adjacent to an area with soil under the railroad tracks that exhibits dose rates that are slightly higher than background. No residences are located adjacent to the SLAPS.

A background monitoring location has been selected to measure the background gamma exposure rate. The background EDD monitoring station is currently located at the USACE Service Base on Arsenal Street (see Figure 3-3).

Outdoor Radon Monitoring

The ATDs will be used to measure alpha particle emissions from radon (primarily Rn-222) and its associated decay products. The radon emissions have the potential to increase during RAs such as the loadout of soil. The ATD results are reported as Rn-222 air concentrations in pCi/L and are then converted to dose equivalent.

Locations were chosen with consideration given to predominant wind direction and sources of contamination. Southwesterly winds predominate from April through December, and northwesterly winds predominate from January through March (Windfinder 2020). The outside locations on all four sides of the loadout pad area for the SLAPS and the four corners of the IA-09 SSA were selected to monitor airborne emissions at points where the exposure is likely to be highest (see Figure 3-2). The locations for ATDs on VP-40A were selected based on predominant wind directions (see Figure 3-1).

The ATDs will be co-located with the EDDs except for one location on VP-40A. The ATD background monitoring location is currently co-located with the background EDD at the USACE Service Base on Arsenal Street (see Figure 3-3).

Indoor Radon Monitoring

ATDs will be located in four Futura buildings. Six ATDs will be placed inside Building 1, four will be placed inside Buildings 2/3, and three will be placed in Building 4. The ATDs will be located in areas that represent the highest likely exposure from indoor radon. The indoor radon monitoring locations at the Futura property are shown on Figure 3-1. Locations have been identified with consideration given to known Ra-226 concentrations under the buildings and personnel occupancy time at any one location in each building. Background indoor radon monitors are not necessary, because the regulatory standard of 0.02 WLs includes background.

Particulate Air Monitoring

Particulate air samplers will be placed between the airborne source and areas accessible to members of the public during work activities that disturb soils and have the potential to generate airborne particulates (e.g., during periods of RA). The locations of these air samplers will be downwind of the work activities. Additional particulate air samplers may be placed around the perimeters of larger active work zones during RAs and the soil loadout area. Airborne particulate radionuclide samples will be collected and subsequently analyzed for relevant radionuclides and/or gross alpha and gross beta activity. The background air particulate station is currently co-located with the background EDD and ATD stations at the USACE Service Base on Arsenal Street (see Figure 3-3).

3.1.3 Monitoring Frequency

Detectors will remain continuously in place to monitor the environment at the sample locations. The EDDs will be replaced and analyzed every quarter. Radon ATDs (i.e., indoor and outdoor) will be replaced and analyzed every 6 months. Stationary particulate air samplers will operate continuously, with samples typically being collected weekly but possibly more frequently because of operational considerations such as dust loading on the filters, which can reduce the sample flow. Excavation and loadout area particulate air samples will operate continuously during active excavation and loadout. The number of samples/measurements and the frequency are identified in Table 3-1.

3.1.4 Field and Laboratory Analyses

Selection of the various monitoring parameters was based on the regulatory requirements with consideration of the radionuclides and their concentrations. The following sections summarize the rationales for analytes and the analysis methods.

Rationale for Analytes

The radionuclides found on site are mainly U-series nuclides. Each site has radionuclides in the U-series that may be predominant (e.g., Ra-226, Th-230, or U-238); thus, each radionuclide must be assessed separately. Therefore, soil sampling results from rail cars associated with each monitoring site will be used to determine source concentration ratios of the individual radionuclides for use in evaluating gross alpha and gross beta air particulate sampling results. Additionally, radon is a component of the U-series nuclides and many radionuclides on site emit gamma radiation.

Analysis Methods

Details regarding the analytical testing methods to be used for analysis of EDDs, ATDs, and particulate radionuclide air samples are presented in the SAG for the SLS (USACE 2000). Analysis of the various media will be accomplished through purchase orders with qualified laboratories or through analysis at the U.S. Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP)-accredited FUSRAP St. Louis Radioanalytical Laboratory using the project laboratory QA plan and standard operating and analysis procedures.

A summary of the type of radiological samples, analysis methods, and target detection levels for the proposed radiological sampling to be completed in CY 2025 is provided in Table 3-2. Justification for the detection levels is based in part on the capabilities of the instrumentation and in part on meeting a lower value than the desired regulatory standard.

Table 3-2. Summary of Laboratory Analysis Methods and Target Detection Levels

Detector/Sample Medium	Analytes Measured	Analysis Method	Target Detection Levels
EDD	Direct external gamma exposure from residual contamination and background	Processed by a qualified vendor	0.1 mrem/quarter
ATD	Airborne Rn-222 and alpha-emitting decay chain isotopes that originate from Ra-226 (indoor and outdoor)	40 <i>CFR</i> 61, Appendix B, Method 114, Method A-7, Rn-222 ATDs	0.2 pCi/L
Particulate Air Filter	Airborne particulate radionuclides: gross alpha and gross beta	40 <i>CFR</i> 61 Appendix B, Method 114, Method A-4, Direct Alpha Counting and Method B-4 Gross Beta Counting	3E-15 μ Ci/mL (gross alpha) ^a 2.E-11 μ Ci/mL (gross beta) ^b

^a Based on 10 percent of the 10 *CFR* 20, Appendix B, Air Effluent value for Class Y Th-230.

^b Based on 10 percent of the 10 *CFR* 20, Appendix B, Air Effluent value for Class Y Th-234 (Th-234 is a beta emitter in secular equilibrium with U-238).

The EDD target detection level of 0.1 mrem per quarter is approximately 0.3 percent of the annual background dose equivalent rate from external exposure and well below the regulatory limit for members of the public of 100 mrem per year.

The ATD target detection level of 0.2 pCi/L is the level achievable at a qualified vendor laboratory. This level is below the 0.5 pCi/L standard contained in 40 *CFR* 192, Subpart A, for locations outside a site.

A radon decay chain isotopes level of 0.02 WL is equivalent to a radon concentration of 5.0 pCi/L when radon is in 40 percent equilibrium with its decay chain isotopes. In an indoor environment, radon is expected to be in approximately 40 percent equilibrium with its decay chain isotopes. Therefore, the 0.2 pCi/L target detection limit for indoor radon is adequate as compared to 5.0 pCi/L.

The detection level concentrations for uranium and thorium isotopes in particulate air samples are based on three analytical methods found in 40 *CFR* 61, Appendix B, Method 114. Because radionuclide-specific concentrations have already been established, Method A-4, direct alpha counting (gross alpha determination), and Method B-4, direct beta counting (gross beta determination), will be used to routinely evaluate activity levels of samples. These methods will determine alpha activity of the sample without extraction and separation of isotopes. The detection level of 3E-15 $\mu\text{Ci/mL}$ for gross alpha, and the detection level of 2E-11 $\mu\text{Ci/mL}$ for gross beta will provide adequate minimum detection levels for dose assessment estimates. Method G-1, high-resolution gamma spectroscopy, will be used as needed to evaluate samples on a case-by-case basis at the qualified vendor laboratory.

3.1.5 Field Quality Control Samples

Two types of QC samples will be collected or used during direct gamma radiation monitoring and environmental radon air monitoring. The types of QC samples include duplicates and transit control samples.

Quality Control Duplicates

Duplicate samples or measurements will be collected using the same protocol and procedures used for obtaining the parent samples and measurements. Duplicate samples/measurements are used to evaluate the precision of the field sampling and measurement process.

At least one duplicate EDD will be designated, as applicable, for QC purposes. Duplicate EDDs will be installed, collected, and analyzed at the same time as the parent sample EDD at that location.

At least one duplicate radon ATD will be designated, as applicable, for QC purposes. Duplicate ATDs will be placed, collected, and analyzed at the same time as the parent sample at that location.

Transit Control Samples

EDD transit control samples will be used to evaluate the integrated dose to the dosimeter when the dosimeters are not in the monitoring locations. These transit control samples will measure the dose while the dosimeters are in storage and in transit to the processing laboratory. ATD transit control samples measure exposure during transit and will be used, if necessary, to evaluate unexpected results to determine if exposure occurred during transport.

3.1.6 Equipment and Sampling Methods

3.1.6.1 Equipment

The following sections describe the types of detectors that will be used to quantify radioactive emissions from the NC Sites. The types of detectors and/or sample collection devices include EDDs, ATDs, and airborne particulate samplers.

External Gamma Monitoring

External gamma exposure rates are measured using environmental EDDs (i.e., aluminum oxide) housed in polyvinyl chloride (PVC) holders/shelters positioned at the monitoring locations (i.e., at the SLAPS and VP-40A). The EDD shelters are located approximately 3 ft above the ground surface at all monitoring locations. Each EDD measures a cumulative dose over the period of exposure and is expressed in mrem per quarter. The measurements must be corrected for shelter absorption, background, fading, and time of exposure to normalize the measurement to exactly one quarter of exposure.

When exposed to gamma radiation, the EDD stores a portion of the energy. When the EDD is stimulated, the stored energy is emitted as light that can be amplified, measured, and used to calculate dose equivalent.

Indoor and Outdoor Radon Monitoring

Rn-222 gas concentrations are measured using ATDs that are designed to record alpha emissions within the sensitive element of the detector. These detectors contain film that, when exposed to alpha particles from the radioactive decay of radon, create submicron damage tracks on the film. After exposure, the detectors are returned to the manufacturer for processing. The film is placed in a caustic etching solution that amplifies the damaged tracks, which are counted using a microscope or automated counting system. The number of tracks per unit area is correlated to the radon concentration in the air. ATDs are purchased from various USEPA-approved manufacturers.

Particulate Air Monitoring

Airborne particulate samplers provide a means to collect particulate radionuclides from the ambient air. Low-volume air pumps, with typical flow rates of 30 to 50 L per minute draw ambient air through a 0.45-micron particulate filter. The filter has a high efficiency for removal of submicron particles. The air pump air flow rates are set and verified using calibrated measurement devices (i.e., rotameters). Average flow rates are calculated using before/after sample loading data. At the end of the sample period, the filters are removed from the housing and sent to a laboratory for analyses.

3.1.6.2 Sampling Methods

The following section describes the field sampling methods for direct gamma radiation and air monitoring. This description is not intended to replace the detailed guidance contained in project instruction guides. The chain-of-custody protocols, sample labeling, identification and shipment procedures, and field logbooks/documentation described in the SAG are applicable to each of the following sampling methods (USACE 2000).

External Gamma Monitoring

EDDs will be placed in each ambient-air monitoring station at the beginning of each monitoring period. These EDDs will be replaced and analyzed after approximately 3 months. The location, date of installation, and date of removal for each detector will be logged. A control/background EDD will accompany the exposed dosimeter during shipment to detect any exposure incurred by the dosimeter during shipment.

Indoor and Outdoor Radon Monitoring

Unexposed, preassembled detectors are received in sealed packages and will remain sealed until they are placed in the detector housings. At the time of deployment, the location, date, and type of detector will be recorded. The new, unexposed detector will be placed in the detector housing with the air inlet holes unobstructed. At the end of the exposure period (approximately 6 months), the exposed

detectors will then be packaged with the transit control detectors and submitted to the laboratory. The removal date will be logged.

Particulate Air Monitoring

The locations for particulate air monitoring stations are carefully selected to maximize the collection of particulates relative to predominant wind directions and active excavation and loadout areas. During RAs (i.e., active excavation and loadout), additional particulate monitoring may be required at appropriate locations and will be evaluated on a task-by-task basis.

Data collection will consist of logging the sample location, start date, time of sample filter deployment, and the initial flow rate of the air pump. At the end of the sampling period, the stop date, time of sample collection, and final flow rate of the air pump will be logged. If the initial air flow rate is different from the final flow rate, the average of the two values will be used to determine the total flow volume over the sampling period. Calibrated rotameters will be used to establish initial and final flow rates. Rotameters will be calibrated on an annual basis.

As the filter is removed from the filter housing, care will be taken to not disturb the collected particulate. The filter will be placed in a suitable container such that sample integrity is not lost during transport to the laboratory.

The length of time between filter change-out can vary depending on the activities at the site. For example, during RAs, filter change-out is normally conducted daily or more often based upon potential filter loading. However, filter change-out should be conducted at least weekly.

3.1.6.3 Field Quality Control Sampling Procedures

Duplicate samples will be collected in association with the EDD and ATD measurements. Duplicates will be collected using the same equipment and sampling methods as defined in Section 3.1.6.2.

3.1.6.4 Field Decontamination

The sampling techniques described previously consist of one-time-use/dedicated sampling media. Therefore, field decontamination is not required for the samples obtained for direct radiation exposure and air (i.e., radon and air particulate) monitoring equipment.

3.2 EXCAVATION WATER, STORMWATER, AND LABORATORY DISCHARGE MONITORING

Excavation water, stormwater, and laboratory discharge monitoring is considered a principal component of the EMICY. RAs at the sites could result in discharges that are covered under separate discharge requirements. Monitoring will be conducted to meet permit requirements, ARAR permit equivalents, or ROD commitments. Parameters are listed in Table 3-3, along with sampling locations and frequencies.

The purpose of excavation water and stormwater discharge sampling is to meet guidelines in the following documentation:

- MSD discharge requirements described in the SLAPS excavation water authorization letter dated July 23, 2001; modified discharge authorization in the letters dated February 10, 2005, and June 19, 2006; and the current renewal letter dated July 22, 2024 (MSD 2001, 2005, 2006, 2024a); and
- MDNR – NPDES ARARs document (MDNR 1998) dated October 2, 1998.

Objectives

The purpose of excavation water discharge sampling is to meet requirements set forth in the original MSD discharge authorization letter dated July 23, 2001; modified in the authorization letters dated February 10, 2005, and June 19, 2006; and the current renewal letter dated July 22, 2024. The current MSD authorization letter approved a daily volume increase to 300,000 gallons per day due to significant rain events in recent years. MSD discharge authorization renewal is required every 2 years. The current MSD authorization letter will expire on July 23, 2026, and will be renewed prior to that date (MSD 2024a). Copies of the MSD authorization letters are included in Appendix A.

On April 20, 2007, the USACE submitted a letter to MDNR regarding the need for a new outfall. This letter indicated that the locations of the outfall would vary depending on the location of the RAs (USACE 2007). This outfall is referred to as the “un-named outfall” in Table 3-3.

On April 5, 2024, the MSD approved the use of one additional MSD manhole (10L3-066S) for excavation water discharge during the RA at James S McDonnell Boulevard near the SLAPS (MSD 2024b). The outfall locations and MSD excavation water discharge points, with the exception of the un-named outfall location, are shown on Figure 3-4.

On June 7, 2024, Outfall 002 (PN02) was removed as part of the RAs at and around the McDonnell Boulevard Bridge over CWC and thus will no longer be sampled. The MDNR was notified as part of the RA planning and NPDES quarterly reporting processes.

The FUSRAP St. Louis Radioanalytical Laboratory is located at the SLAPS at 112 James S McDonnell Boulevard, Hazelwood, Missouri. The laboratory’s wastewater (i.e., glassware cleanup wastewater, decontamination water, and neutralized isotopic separations waste) discharge point is co-located with the SLAPS treated wastewater (i.e., accumulated excavation and groundwater) discharge point. As reported in the EMDAR for CY 2020, the USACE worked with the MSD to combine the project laboratory discharges and the SLAPS discharges under one MSD special discharge authorization (MSD 2020a, 2020b). A separate MSD Special Discharge Authorization Letter is no longer required for the FUSRAP St. Louis Radioanalytical Laboratory.

The NPDES permit equivalent for stormwater discharges requires that outfalls be sampled in accordance with the NPDES ARARs document (i.e., NPDES permit equivalent). The NPDES ARARs contained in the ROD specify ARAR discharge limits for monitoring purposes at this site. Copies of the MSD discharge authorization letters and the MDNR NPDES permit equivalent are contained in Appendix A.

3.3 SURFACE WATER AND SEDIMENT MONITORING

As part of the EMP, surface water and sediment samples will be collected along CWC to analyze for the radiological and chemical parameters presented in List 2 of Table 3-3. The physical field parameters will be measured only for surface water as presented in List 2 of Table 3-3.

Objectives for CWC monitoring follow.

- Assess the quality of surface water and sediment in CWC.
- Compare the sampling results of the COCs to the RGs for sediment in the ROD.
- Evaluate/determine whether runoff due to RAs is affecting the quality of surface water and sediment in CWC.

Surface water and sediment samples will be collected from CWC on a semi-annual basis during active RA to determine if the creek is being measurably affected by COC migration

(USACE 2005). The surface water sampling events will be conducted at the existing 10 CWC monitoring stations (i.e., C002 through C011) shown on Figure 3-5. Sediment samples will be collected in depositional environments near each of the 10 previously described surface water locations (i.e., C002 through C011) (Figure 3-5). Sampling frequency, along with sampling parameters and locations, are listed along with surface water information in Table 3-3. This sampling will be conducted at CWC's base flow. Samples will be collected twice per year over a 2- to 3-day period during the first and fourth quarters to obtain representative samples of base-flow water and sediment conditions for the year.

Table 3-3. Stormwater, Excavation Water, Laboratory Waste Water, Surface Water and Sediment Monitoring Locations, Frequencies, and Parameters

Site	Monitoring Location	Sample ID/ Outfall	Media/Sample Type	Frequency ^a	Parameters ^b	Driver/ Purpose	Status	Comments
NC Sites	MSD Sewer	MSD Inlet 10L3-043S ^c	Stormwater and Wastewater/Grab	Per Batch	Various ^d	MSD	Active	Sampling is batch-dependent and, therefore, conducted on a non-routine basis. MSD Discharge Letter to the USACE dated July 23, 2001, and letters revised February 10, 2005; June 19, 2006; May 22, 2008; May 10, 2010; May 24, 2012; June 23, 2014; July 18, 2016; June 11, 2018; July 16, 2020; June 7, 2022; and July 22, 2024 (MSD 2001, 2005, 2006, 2008, 2010, 2012, 2014, 2016, 2018a, 2020a, 2022, 2024a).
	Un-Named Outfall	Un-Named Outfall	Stormwater/Grab	Per Storm Event	List 1	NPDES	Active	USACE letter from Sharon Cotner addressed to Thomas Siegel dated April 20, 2007 (USACE 2007).
CWC	Location 1 through Location 10	C002 through C011	Surface Water – Sediment	Semi-Annually	List 2	EMP	Active	Not Applicable.
	Locations 1, 6, and 8	C002, C007, and C009	Surface Water (High-Flow)	Semi-Annually	List 2	EMP	Active	Sampling will be conducted soon after a precipitation event resulting in high-flow conditions (i.e., gage height >6 ft, discharge/streamflow >2,000 ft ³ /second) are indicated at the U.S. Geological Survey (USGS) stream gage (i.e., 06936475) on CWC near Black Jack, Missouri.
	McDonnell Boulevard Bridge ^e	McDonnell Boulevard Bridge ^e	Surface Water (Active RA)	Monthly ^f	List 2	EMP	Active	Sampling will be conducted monthly during active RA of contaminated soil with the potential to affect water quality.

^a **Definition of Frequency Lists****List 1** includes all parameters once per month, and total U, total Ra, total Th, gross alpha, gross beta, Pa-231, Ac-227 – per runoff event, radon – twice per year and COD annually.**List 2** includes COCs – semi-annual.^b **Definition of Parameter Lists****List 1** includes flow (mgd), oil and grease (mg/L), TPH (mg/L), COD (mg/L), settleable solids (mL/L/hour), arsenic (total recoverable) (µg/L), cadmium (total recoverable) (µg/L), chromium (total recoverable) (µg/L), gross alpha (pCi/L), gross beta (pCi/L), polychlorinated biphenyls (µg/L), total Ra (pCi/L and µg/L), total Th (pCi/L and µg/L), total U (pCi/L and µg/L), Pa-231 (pCi/L), Ac-227 (pCi/L), radon (pCi/L), and pH.**List 2** includes radiochemical parameters, metals, and field parameters.**Definitions for Parameters****Radiochemical parameters** include Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238.**Metals** include antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, and vanadium.**Field parameters** for water only include temperature, pH, specific conductance, and oxidation reduction potential and dissolved oxygen.^c MSD Inlet 10L3-043S is the primary discharge location; however, inlets 06JS-053S, 06JS-052S, 06JS-049S, 09K3-044S, 09K3-047S, 09K3-048S, 09K3-049S, 09K3-050S, 09K4-012S, 09K4-015S, 09K4-016S, 09K4-017S, 09K4-018S, 09K4-019S, 09K4-033S, 09K4-034S, 09L3-088S, 10K4-018S, 10K4-039S, 10K4-049S, 10K4-050S, 10K4-051S, and 10L3-066S may also be used.^d Per the 07/23/01 MSD letter, effluent must be tested for Ra-226, Ra-228, Th-228, Th-230, U-234, U-235, U-238, gross alpha, barium, lead, and selenium and meet the following standards: MSD Ordinance 8472; the NRC in 10 *CFR* 20; and Missouri Department of Health Title 19 *Code of State Regulations (CSR)* 20-10 (MSD 2001).^e McDonnell Boulevard Bridge or other locations along CWC where active RAs are being conducted within the CWC corridor that have the potential to affect water quality.^f Monthly surface water samples will be periodically collected downstream from active RAs when RA is being conducted within the CWC corridor that have the potential to affect water quality.

Surface water samples will also be collected from CWC on a semi-annual basis during high-flow conditions as a BMP to determine if the creek is being measurably affected by COC migration. The high-flow surface water sampling events will be conducted at an upstream (i.e., C002), a midstream (i.e., C007), and a downstream (i.e., C009) location (Figure 3-5). Sampling frequency, parameters, locations, and surface water information are listed in Table 3-3. This sampling will be conducted soon after a precipitation event resulting in high-flow conditions (i.e., gage height greater than 6 ft; discharge/streamflow greater than 2,000 ft³ per second) are indicated at the U.S. Geological Survey (USGS) stream gage (i.e., 06936475) on CWC near Black Jack, Missouri. Samples will be collected twice per year over a 1- to 2-day period.

If a flood event occurs on CWC, the USACE/contractor may collect surface water and sediment samples (once the flood subsides) in areas of obvious flood sedimentation and downstream of any remedial activities. The samples will be collected and analyzed for both radiological and metals COCs. The number of samples and locations would be dependent on the magnitude of the flood event and the areas where RAs are on-going. All sampling will be at the discretion of the USACE. The sampling methods and parameters would be consistent with the routine semi-annual CWC surface water and sediment sampling as described in the EMICY.

Monthly surface water samples will also be periodically collected from CWC downstream from active RAs on days when contaminated soil remedial activities are taking place within the CWC corridor that have the potential to affect water quality. These samples will be collected as a BMP to determine if the creek is being measurably affected by COC migration that could result from RA. These monthly surface water samples will be collected from temporarily established or existing stations downstream from active RAs that meet the access conditions for sampling. The sampling methods and parameters, including water quality would be consistent with the routine semi-annual CWC surface water sampling as described in Section 3.3 of this EMICY.

3.4 GROUNDWATER MONITORING

3.4.1 Objectives for Groundwater Monitoring

Groundwater monitoring will be completed to meet various federal, state, and ROD requirements.

The purposes of the groundwater monitoring effort are listed as follows.

- Identify potential impacts to groundwater quality resulting from RA.
- Ensure compliance with ARARs.
- Obtain requisite data for CERCLA remedial performance evaluations.
- Determine and monitor background water quality at each site.

The primary objectives and a summary of the hydrogeology are briefly discussed in the following section. A detailed description of the geology and hydrogeology of each site can be found in prior environmental documents and the EMG (USACE 1999).

3.4.1.1 SLAPS and SLAPS VPs Groundwater Sampling Objectives

The sampling objectives for the SLAPS and the SLAPS VPs include the following.

- Evaluate potential groundwater contaminant migration and flow primarily in the upper HZ.
- Monitor surface water in CWC to assess potential impact due to COCs in the upper HZ.

- Evaluate potential impacts to groundwater quality in various horizons (i.e., HZ-A and Unit 4 of HZ-C) that may result from RA.
- Provide data necessary for CERCLA evaluations.

Five HZs are recognized beneath the SLAPS (see Figure 3-6). The surficial deposits, consisting of topsoil and anthropogenic fill (i.e., Unit 1), and the Pleistocene glacially related sediments of stratigraphic Unit 2 and Subunit 3T comprise the HZ-A. HZ-B is a clay with low vertical permeability comprising Subunit 3M of stratigraphic Unit 3. HZ-C consists of silty clay, clayey silt, and clayey gravel deposits that make up stratigraphic Subunit 3B and Unit 4. The shale (i.e., Unit 5) and limestone (i.e., Unit 6) bedrock are recognized as HZ-D and HZ-E, respectively.

The existing groundwater monitoring well network for the SLAPS and the SLAPS VPs is illustrated on Figure 3-7. No wells are planned for decommissioning in CY 2025.

Groundwater sampling parameters are listed in Table 3-4. The comprehensive sampling events will be conducted quarterly with the possible transition to semi-annual groundwater sampling at all or a portion of the wells in the network. If the comprehensive sampling were to be conducted, it would include collection of groundwater samples from the entire well network of 16 wells for the SLAPS and SLAPS VPs. Samples will be analyzed for the SLAPS and SLAPS VPs sampling parameters listed in Table 3-4.

Table 3-4. Groundwater Monitoring by Site

Site	Parameter ^a	Driver/Purpose
SLAPS and SLAPS VPs	Lists 1, 2, and 3	ROD (USACE 2005)
Latty Avenue Properties	Lists 1, 2, and 3	ROD (USACE 2005)

^a In addition to the parameters listed here, the USACE may elect to add any parameters identified in the quality assurance project plan (QAPP) section of the SAG as part of the monitoring (USACE 2000).

Definition for Parameters:

List 1: Radiochemical parameters include Ac-227, and Pa-231, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238.

List 2: Metals include antimony, arsenic, barium, cadmium, chromium, molybdenum, nickel, selenium, thallium, and vanadium.

List 3: Field parameters include pH, specific conductance, oxidation reduction potential, temperature, dissolved oxygen, turbidity, and static water level.

3.4.1.2 Latty Avenue Properties Groundwater Sampling Objectives

The objectives for groundwater sampling at the Latty Avenue Properties include the following.

- Evaluate potential groundwater contaminant occurrence and migration primarily in the upper HZ.
- Monitor surface water in CWC to assess potential impact due to COCs in the upper HZ.
- Evaluate potential impacts to groundwater quality in various horizons (i.e., HZ-A and Unit 4 of HZ-C) resulting from previous RA.
- Provide data necessary for CERCLA evaluations.

The hydrogeologic and geologic setting at the Latty Avenue Properties is similar to that at the SLAPS (see Figure 3-6), with one exception. The Pennsylvanian shale bedrock unit (i.e., HZ-D) present at the SLAPS is absent at the Latty Avenue Properties.

The current groundwater monitoring well network for the Latty Avenue Properties is identified on Figure 3-8. No monitoring wells are planned for decommissioning at the Latty Avenue Properties in CY 2025.

Groundwater sampling parameters are listed in Table 3-4. The comprehensive sampling events will be conducted quarterly with the possible transition to semi-annual groundwater sampling at

all or a portion of the wells in the network. If the comprehensive sampling were to be conducted, it would include collection of groundwater samples from the entire well network of 8 wells for the Latty Avenue Properties. Samples will be analyzed for the Latty Avenue Properties sampling parameters listed in Table 3-4.

3.4.2 Proposed New Groundwater Monitoring Wells

As identified in Section 3.4.1, groundwater monitoring will be completed to meet the ROD objectives. To accomplish these and other groundwater-related objectives, additional wells or well replacements may need to be installed during CY 2025, should conditions change. Specific objectives that could be considered at each site follow.

- Identify potential impacts to groundwater quality resulting from RA.
- Ensure compliance with ARARs.
- Obtain requisite data for CERCLA remedial performance evaluations.
- Determine or monitor background water quality at each of the sites.
- Ensure an adequate monitoring network is established for potentiometric and groundwater quality monitoring at each key HZ.
- Evaluate groundwater contaminant occurrence and migration.
- Evaluate the existing monitoring network.

Based on current RAs planned for CY 2025, four additional groundwater monitoring wells are proposed for installation at or near CWC-101 (Figure 3-9). Up to an additional four wells may also be installed at or near the SLAPS.

3.4.3 Rationale for Groundwater Monitoring

The rationale for the sampling programs established for each site is based on well-analyte history and site-specific requirements and conditions. The rationale for the groundwater monitoring plan correlates with the guidelines identified in Section 2.2.4. Analytes targeted for monitoring include soil COCs as identified in the ROD (USACE 2005), as well as selected indicator constituents with high mobility that can serve as early indicators of contaminant migration. Analytes may be added to this list at the discretion of the USACE.

3.4.4 Field and Laboratory Analyses

Based on previous soil and groundwater sampling, categories of known or potential groundwater contaminants have been identified for each site. Based on the identified categories, groundwater samples collected at each site will undergo laboratory analysis for the parameters previously identified in Table 3-4. Details regarding the analytical testing methods to be used for chemical analysis of these groundwater samples are presented in the SAG (USACE 2000).

Purging and sampling of groundwater monitoring wells will be accomplished using dedicated bladder-type pumps, non-dedicated electric submersible or peristaltic pumps, or similar equipment. Field measurements of static water level, pH, specific conductance, oxidation-reduction potential, temperature, dissolved oxygen, and turbidity will be recorded during purging and sampling activities. The water level is measured prior to purging, after the well has reached equilibrium, and during purging to assess drawdown.

In cases where groundwater recharge into a monitoring well is rapid, groundwater samples will be collected immediately after stabilization of field measurements and completion of purging at least one well volume. However, in cases where recharge is slow, water quality parameters and water levels will be measured during well purging. If an appreciable decrease in water level (greater than 1 ft) is observed, the purge rate will be decreased in an attempt to stabilize drawdown. If the well purges dry after decreasing the purge rate to the lowest practical limit of the pump, a groundwater sample will be collected after 75 percent of groundwater level recovery, or 24 hours. Groundwater samples collected for analysis of metal, radiological, and water-quality parameters will be collected as unfiltered. The USACE may elect to have both filtered and unfiltered samples collected at any monitoring well, particularly new wells in which the turbidity is greater than 50 NTUs and existing wells if adverse sampling conditions make it difficult to obtain samples that are free of sediment.

3.4.4.1 Quality Assurance/Quality Control Duplicate and Split Samples

In addition to the sampling conducted for the field measurements previously described, duplicate samples and split samples will be collected by the USACE/contractor during performance of groundwater sampling activities. The monitoring well locations selected for duplicate and split sampling will be random. The exact number of duplicate and split samples collected will depend on the total number of groundwater samples collected during each quarterly sampling event. One duplicate sample and one split sample will be collected for approximately every 20 groundwater samples collected. The duplicate and split samples will be analyzed for the same groundwater parameters as the samples collected in accordance with this EMICY. Additional information regarding field QA/QC sampling requirements, and the analytical testing methods to be used for chemical analysis of QA/QC samples, is presented in the SAG (USACE 2000).

4.0 PROGRAM PROTOCOLS

4.1 ORGANIZATION

The USACE St. Louis District will issue an annual EMICY for each CY that defines the program monitoring requirements for the upcoming year with respect to sampling locations, frequencies, monitoring parameters, and the rationale for their selection. Organizational responsibilities for implementation of the EMICY will correspond to those delineated in the SAG (USACE 2000) or other implementation plans. If non-periodic environmental sampling activities are required to meet CERCLA objectives and if these activities are not discussed in an implementation plan, a work description or final status survey plan that describes the activity-specific requirements will be issued. Each work description or plan will describe responsibilities for its implementation to the extent those roles differ from those specified by the SAG or other implementation guide.

4.2 SAMPLING PROCEDURES

Field sampling procedures for the various media monitored under the EMICY will conform to the requirements specified in the SAG. No unique sampling procedures are required to meet the objectives defined in this annual EMICY.

4.3 SAMPLE MANAGEMENT

Samples collected under this EMICY will be managed in the field, as specified in the SAG. Sample container, preservation, and holding-time requirements for samples collected under the EMICY are also specified in the SAG. Sample documentation requirements, which include the sample numbering system, logbook requirements, and sample labels that pertain to samples collected under the EMG, are presented in the SAG. Chain-of-custody requirements for EMICY samples are also specified in the SAG.

4.4 ANALYTICAL PROTOCOLS

Samples collected under this EMICY will be quantified by the methods specified in the SAG. No unique analytical protocols are necessary to meet the objectives identified in this EMICY.

4.5 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

IDW resulting from implementation of this EMICY will be managed in accordance with the requirements of the USEPA *Guide to Management of Investigation-Derived Wastes* (USEPA 1992). The management of IDW generated from various activities at FUSRAP is outlined in Table 4-1.

Table 4-1. Investigation-Derived Waste Management Options

Waste Type	IDW^a	Generation Process	Management Option^b
Water	Groundwater	Well development Well sampling and/or purging Other characterization activities	<u>Regulated or Suspect (i.e., Resource Conservation and Recovery Act [RCRA])</u> : containerize and place in storage or treat onsite. <u>Non-regulated or non-suspect</u> : purge water from wells at the SLDS will be disposed of by the RAC.
	Surface water	Characterization activities	Excess surface water is not anticipated from this activity.
	Decontamination water	Decontamination of equipment	Disposition in controlled area such that it will not pond or run offsite or through an outfall.
Soil	Soils and/or sediment	Drill cuttings Soil sampling	<u>Known or suspect contaminated area</u> : place soil in a contaminated soil pile or other designated location. <u>Known or suspect uncontaminated area</u> : backfill location or spread cuttings around sample location.
Waste	Containerized wastes	Sampling	Return unused portion to original source container.
Sample Equipment	Personal protective equipment	Sample activities Other miscellaneous activities	<u>Reusable</u> : decontaminate. <u>Disposable</u> : dispose of with other radiological trash. If used to sample suspect hazardous wastes, segregate and dispose of as directed by task manager or designee.
	Equipment	Sampling equipment Monitoring equipment (swipes, filters, etc.)	<u>Reusable</u> : decontaminate. <u>Disposable</u> : dispose of as radiological trash. If used to sample suspect hazardous wastes, segregate and dispose of as directed by task manager or designee.
Laboratory Wastes	Soil, filter papers, test tubes, other radiological trash, etc.	Analysis	Dispose of as radiological trash. If used to sample suspect hazardous wastes, segregate and dispose of as directed by task manager or designee.
	Acid wastes	Analysis	Neutralize with caustic soda at point of generation and store in 5-gallon containers.
	Other liquid wastes	Analysis Equipment decontamination	<u>Regulated or suspect regulated</u> : neutralize, containerize, and treat (solidify) radium analysis liquid waste (lead) at generation with Quikrete® or equivalent, rendering it non-hazardous. Dispose of as radiological trash. <u>Non-regulated or non-suspect</u> : containerize and store in designated storage area.

^a Management and disposition of wastes not listed in this table will be evaluated on case-by-case basis following the referenced USEPA guidance.

^b Options may be modified on case-by-case basis but will follow the USEPA guidance.

5.0 REFERENCES

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- MDNR 2002. Missouri Department of Natural Resources. Letter dated February 19, 2002. From Matthew Sikes, Environmental Specialist, to Sharon Cotner, USACE FUSRAP Project Manager. Subject: Removal of Outfall 003 and Reduced Sampling on Outfall 002.
- MSD 2001. Metropolitan St. Louis Sewer District. Letter dated July 23, 2001. From Bruce H. Litzsinger, Civil Engineer, to Sharon Cotner, USACE FUSRAP Project Manager. Subject: St. Louis Airport Site, File: SD - St. Louis FUSRAP Site, 110 McDonnell.
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- MSD 2016. Metropolitan St. Louis Sewer District. Letter dated July 18, 2016. From Steve Grace, Environmental Assistant Engineer, to Bruce Munholland, USACE FUSRAP Project Manager. Subject: FUSRAP St. Louis Airport Site, File: SD – St. Louis Airport FUSRAP Site [9012138501] SP801.
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- MSD 2018b. Metropolitan St. Louis Sewer District. Letter dated February 7, 2018. From Steve Grace, Environmental Assistant Engineer, to Bruce Munholand, USACE FUSRAP Project Manager. Subject: FUSRAP HISS Laboratory Special Discharge Permit Extension. File SD, Hazelwood Interim Storage Site [SOUR057900], 8945 Latty Avenue, Berkeley.
- MSD 2020a. Metropolitan St. Louis Sewer District. Letter dated July 16, 2020. From Steve Grace, Environmental Assistant Engineer, to Bruce Munholand, USACE FUSRAP Project Manager. Subject: FUSRAP St. Louis Airport Site, File: SD – St. Louis Airport FUSRAP Site [1048495000] SP801.
- MSD 2020b. Metropolitan St. Louis Sewer District. Email dated January 16, 2020. From Steve Grace, Environmental Assistant Engineer, to USACE FUSRAP Project Staff. Subject: FUSRAP HISS Laboratory Special Discharge Permit Expiration. File SD, Hazelwood Interim Storage Site [SOUR057900], 8945 Latty Avenue, Berkeley. Laboratory in integration into FUSRAP St. Louis Airport Site Discharge Authorization, File: SD – St. Louis Airport FUSRAP Site [1048495000] SP801.
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- MSD 2020d. Metropolitan St. Louis Sewer District. Email dated November 10, 2020. From Steve Grace, Environmental Assistant Engineer, to USACE FUSRAP Project Staff. Subject: Ford Lane and Hazelwood Avenue MSD Manhole Discharge Authorization.
- MSD 2022. Metropolitan St. Louis Sewer District. Letter dated June 7, 2022. From Steve Grace, Environmental Assistant Engineer, to Dave Evans, USACE FUSRAP Project Chemist. Subject: FUSRAP St. Louis Airport Site, File: SD – St. Louis Airport FUSRAP Site [1048495000] SP801.
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FIGURES

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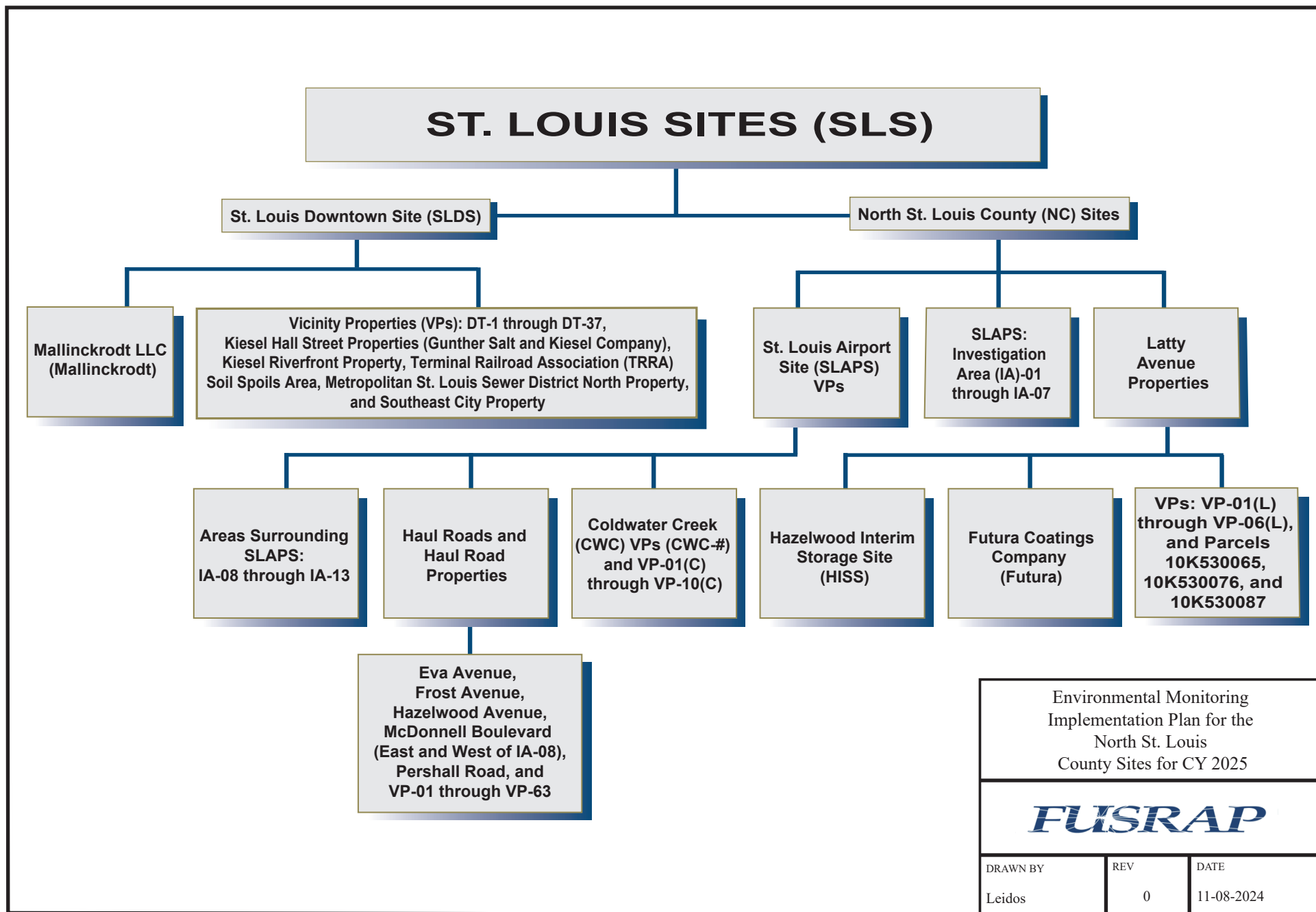


Figure 1-1. Schematic Representation of the FUSRAP SLS

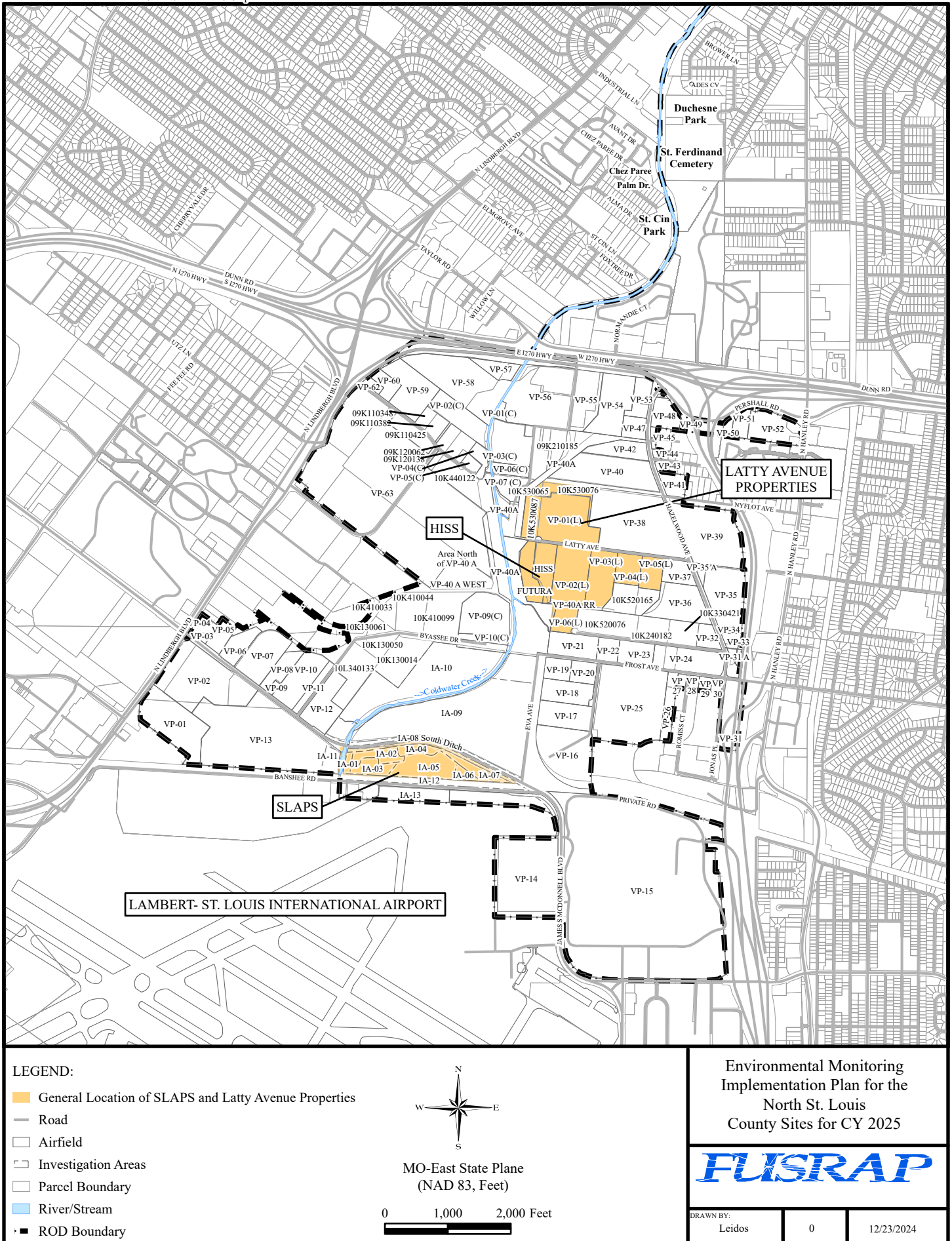
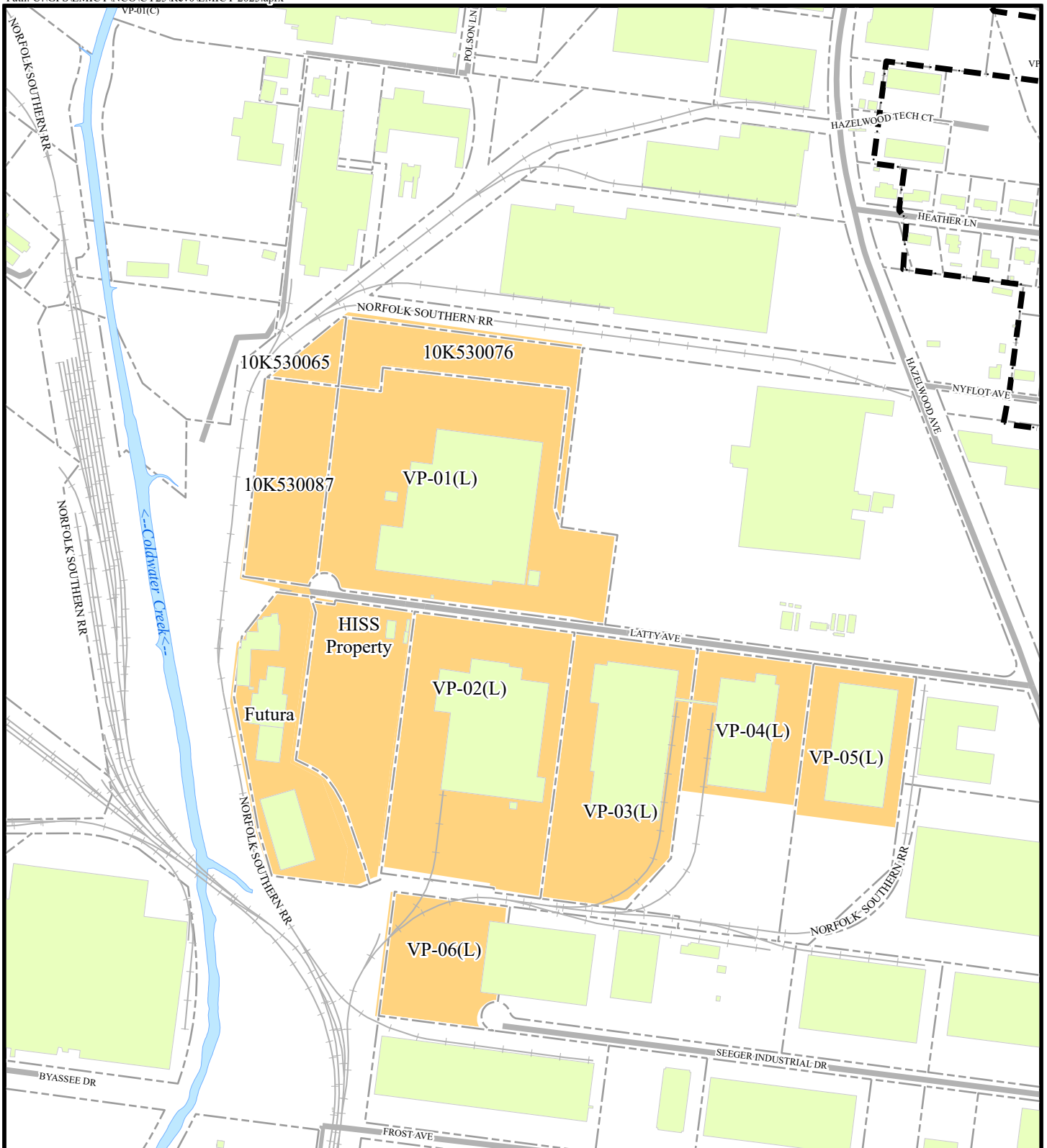
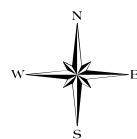


Figure 1-2. Plan View of the NC Sites



LEGEND:

- Latty Avenue Property
- Road
- Railroad
- Parcel Boundary
- Coldwater Creek
- ROD Boundary
- Building



MO-East State Plane
(NAD 83, Feet)

0 250 500 Feet



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FUSRAP

DRAWN BY:

Leidos

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12/23/2024

Figure 1-3. Plan View of the Latty Avenue Properties

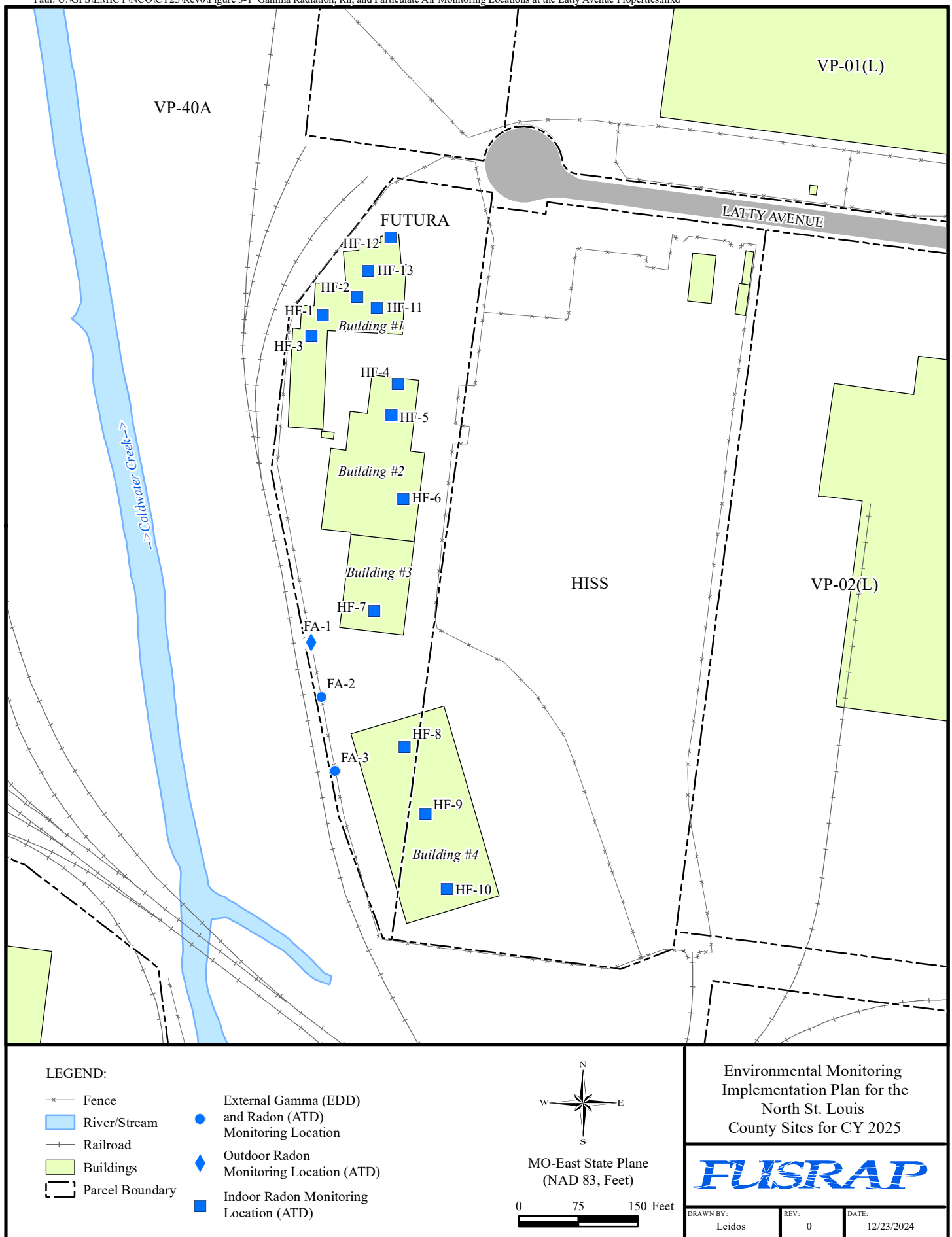


Figure 3-1. Gamma Radiation and Radon Monitoring Locations at the Latty Avenue Properties

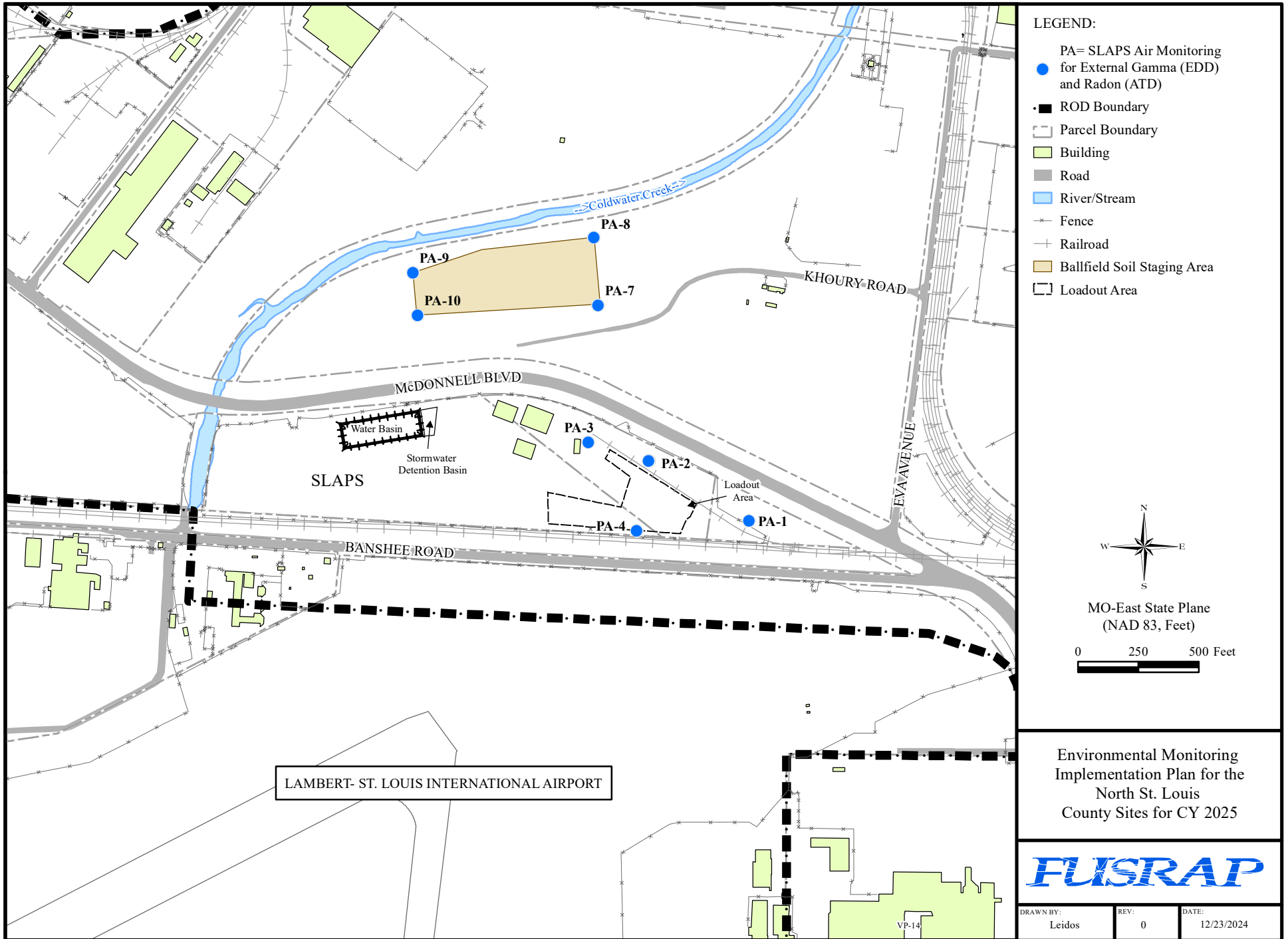


Figure 3-2. Gamma Radiation and Radon Monitoring Locations at the SLAPS and IA-09

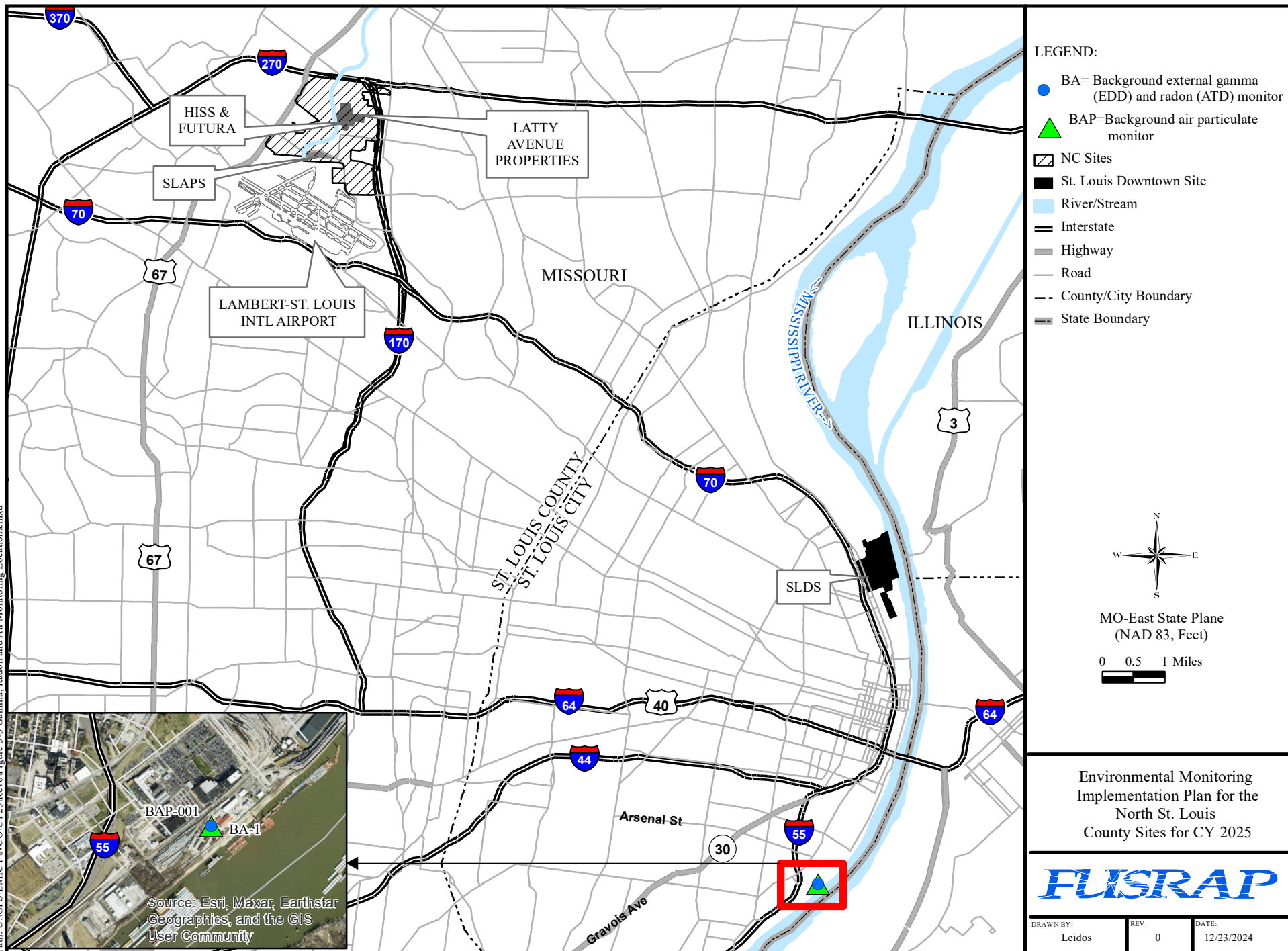
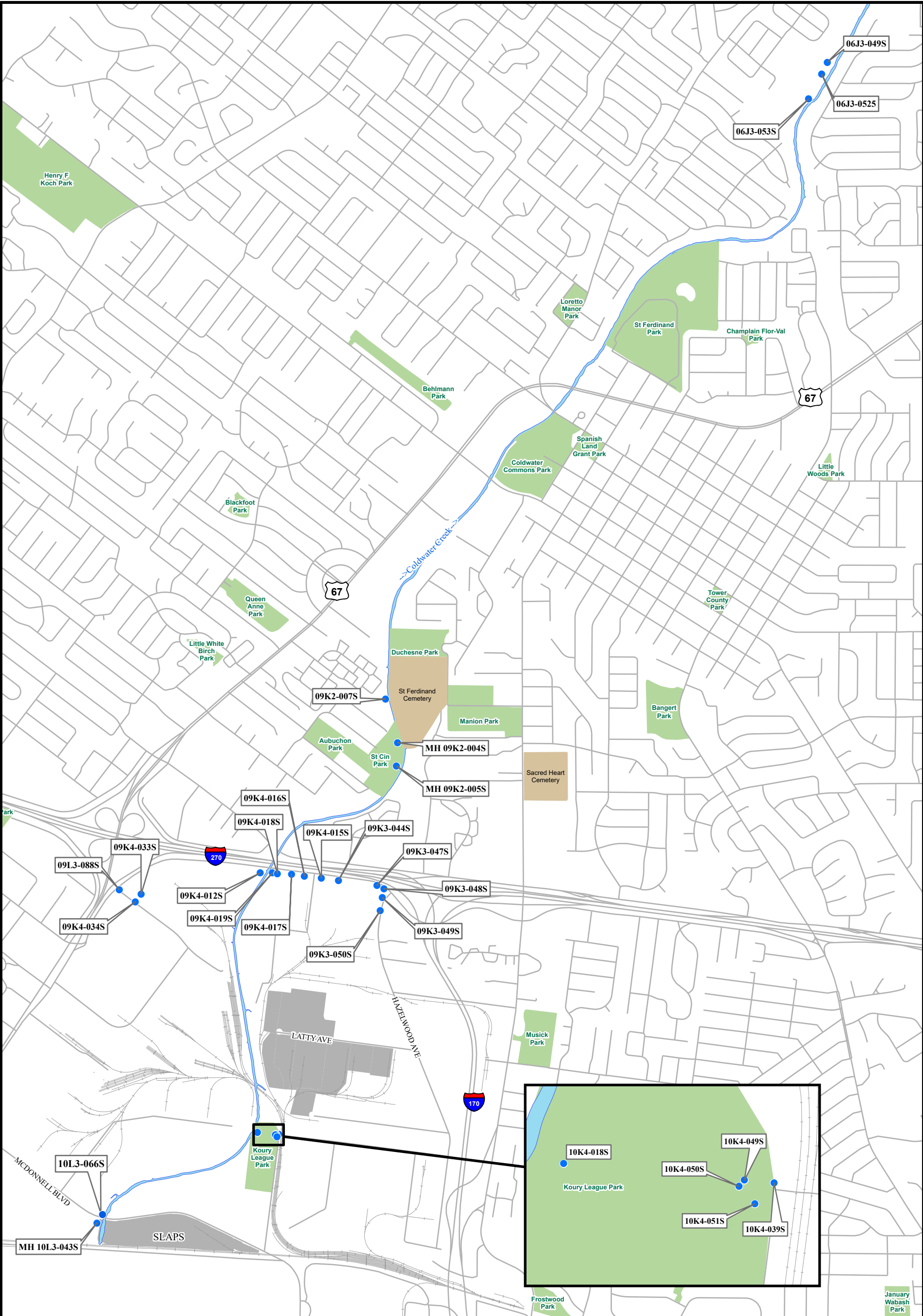
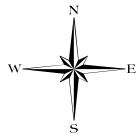


Figure 3-3. Gamma Radiation, Radon, and Particulate Air Monitoring at the St. Louis Background Location - USACE Service Base



LEGEND:

- MSD Manholes (Discharge Points)
- General Location of SLAPS and Latty Avenue Properties
- Cemetery
- Park
- Road
- Railroad
- River/Stream



MO-East State Plane
(NAD 83, Feet)

0 1,000 2,000 Feet

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DRAWN BY: Leidos REV: 0 DATE: 12/23/2024

Figure 3-4. Stormwater Outfall and MSD Excavation Water Discharge Points

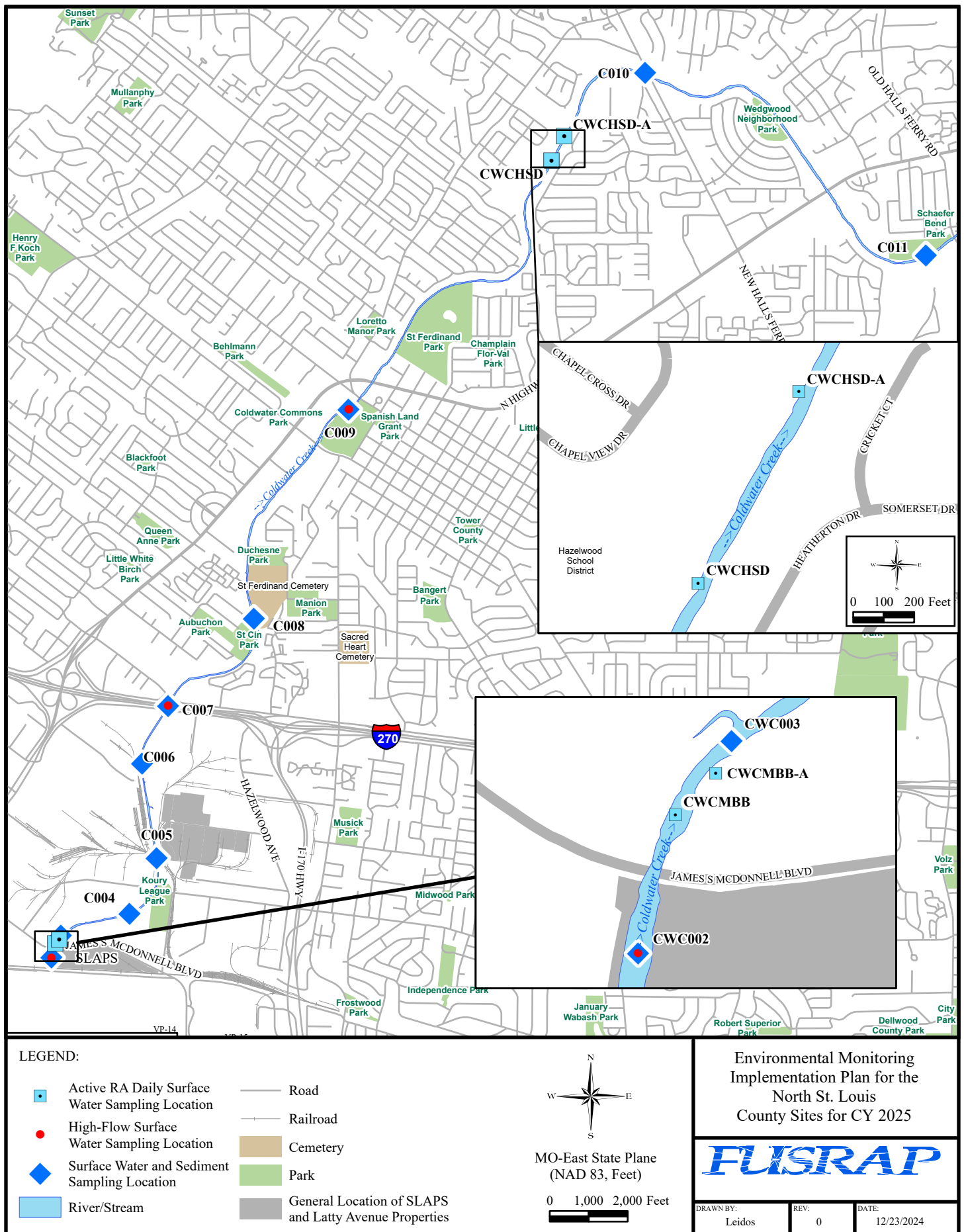


Figure 3-5. Surface Water and Sediment Sampling Locations at CWC

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.	
			GLACIO-LACUSTRINE 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)	
			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)	
			SILTY CLAY	10-29	Similar to upper silty clay. Probable unconformable contact with highly plastic clay. (3B)	
		BASAL CLAYEY AND SANDY GRAVEL	0-6	UNIT 4 Glacial clayey gravels, sands, and sandy gravels. Mostly Chert.		
Hydrostratigraphic zone (HZ)-B	Quaternary	Pleistocene				
Hydrostratigraphic zone (HZ)-C						
Hydrostratigraphic zone (HZ)-D			Pennsylvanian		CHEROKEE GROUP (UNDIFFERENTIATED)	0-35
Hydrostratigraphic zone (HZ)-E		Mississippian		STE. GENEVIEVE AND ST. LOUIS LIMESTONES	10+	UNIT 6 BEDROCK: Hard, white to olive, well cemented, sandy limestone with interbedded shale laminations.



Environmental Monitoring Implementation Plan
for the North St. Louis County Sites for CY 2025

NOT TO SCALE

AUTHOR:
Leidos

REV. NO. - DATE:
0 - 11-08-2024

Figure 3-6. Generalized Stratigraphic Column for the SLAPS and the HISS

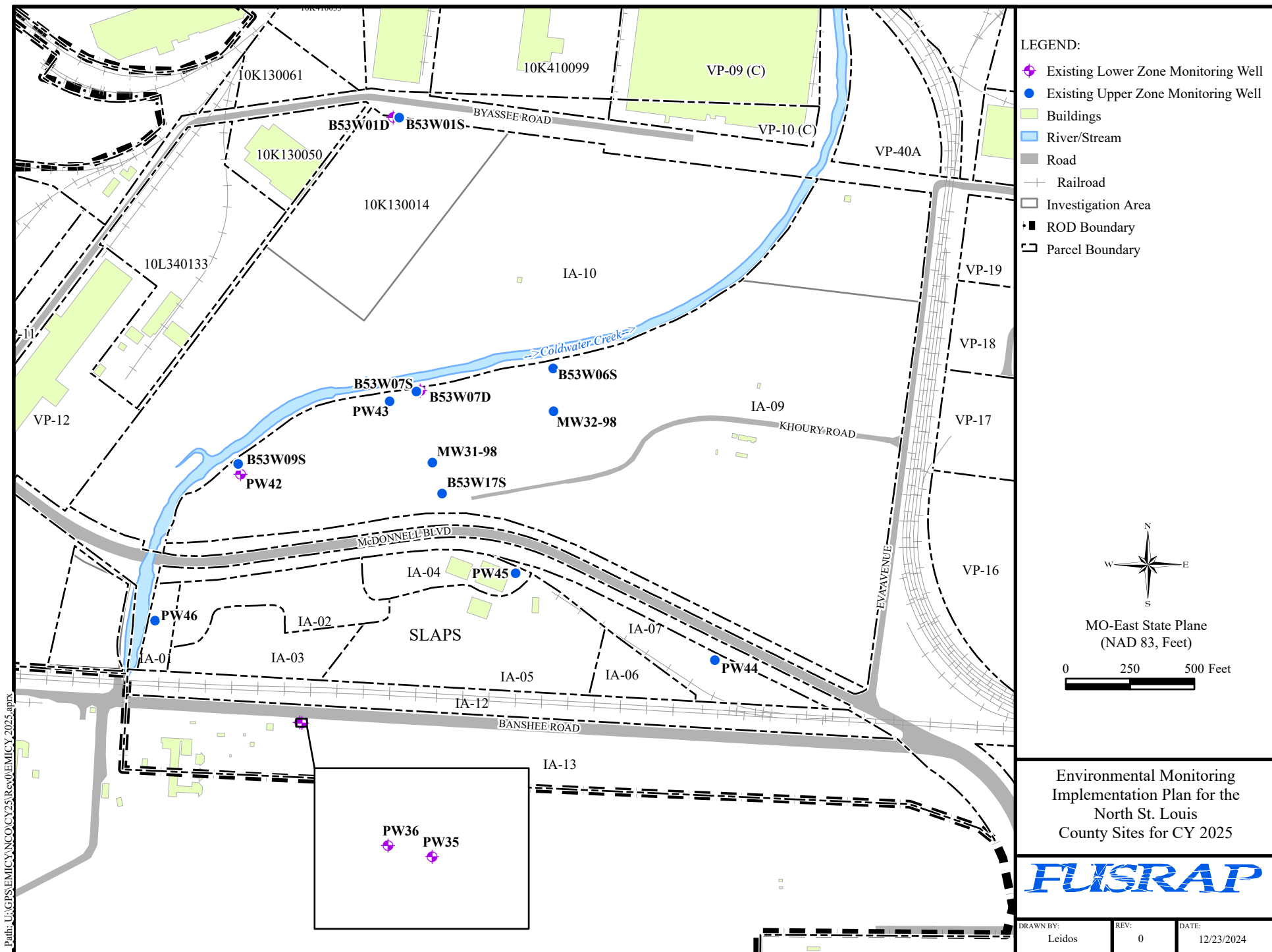


Figure 3-7. Groundwater Monitoring Well Locations at the SLAPS and Surrounding SLAPS VPs

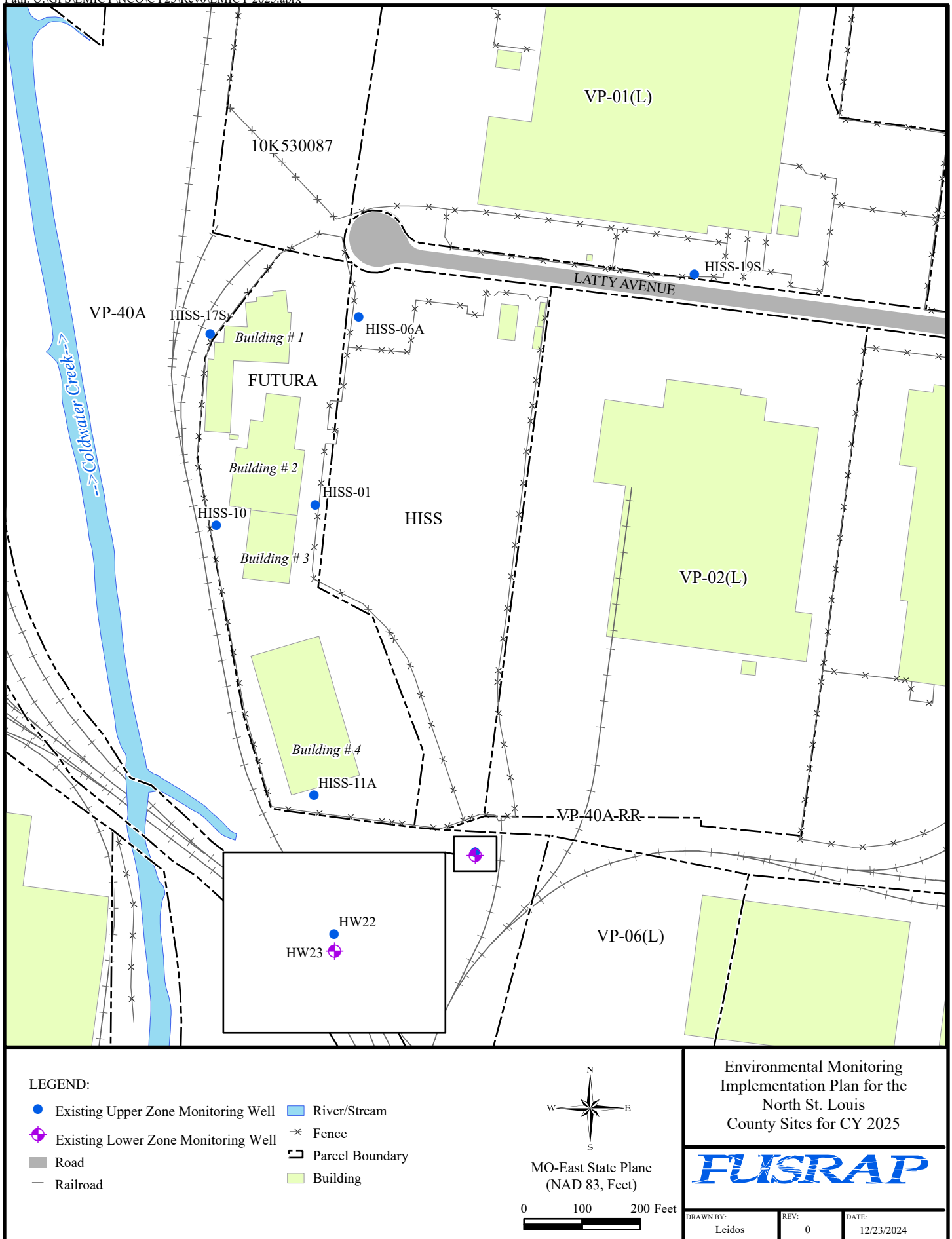
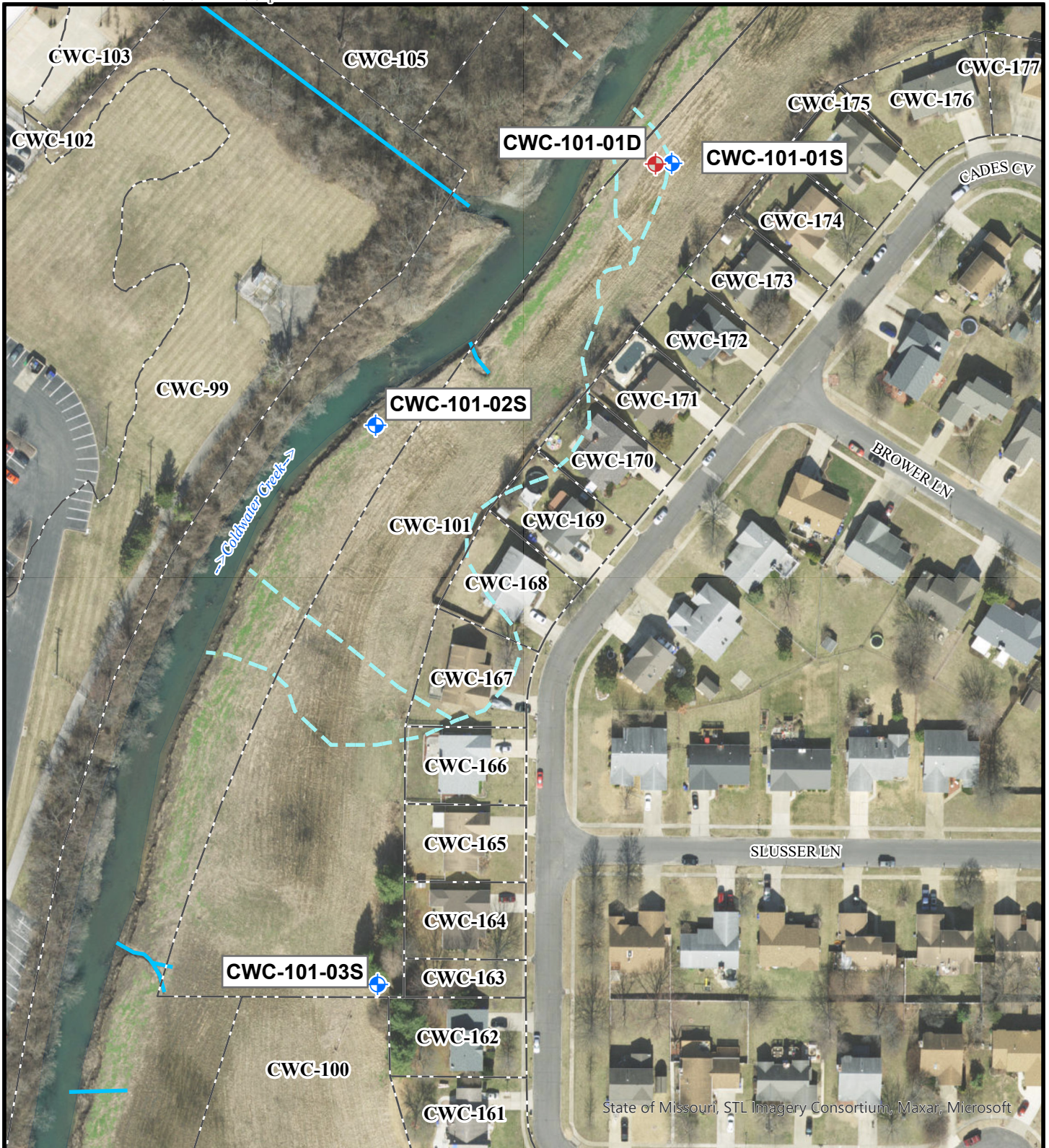


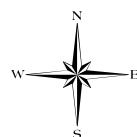
Figure 3-8. Groundwater Monitoring Well Locations at the Latty Avenue Properties



State of Missouri, STL Imagery Consortium, Maxar, Microsoft

LEGEND:

-  Proposed Shallow Monitoring Well
-  Proposed Deep Monitoring Well
-  CWC Property Boundary
-  Historical Drainage
-  Current Drainage/Tributary



MO-East State Plane
(NAD 83, Feet)

0 50 100 Feet

Environmental Monitoring
Implementation Plan for the
North St. Louis
County Sites for CY 2025

FUSRAP

DRAWN BY:
Leidos

REV:
0

DATE:
12/23/2024

Figure 3-9. Proposed Groundwater Monitoring Well Locations at CWC-101

APPENDIX A
REGULATORY CORRESPONDENCE

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STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Mel Carnahan, Governor • Stephen M. Mahood, Director

DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

October 2, 1998

Ms. Sharon Cotner, Project Manager
Department of the Army
St. Louis District, Corps of Engineers
9170 Latty Avenue
Berkeley, MO 63134

RE: St. Louis Airport Site (SLAPS), St. Louis, MO

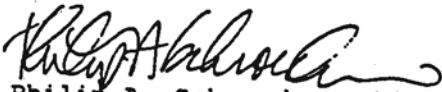
Dear Ms. Cotner:

We have enclosed the Applicable or Relevant and Appropriate Requirements (ARARs) for the referenced site. We look forward to working with the United States Army Corps of Engineers (USCOE) to insure that the substantive requirements of Missouri's Clean Water Law and Regulations are met.

If you have any questions, please contact Richard Laux at (573) 751-6982.

Sincerely,

WATER POLLUTION CONTROL PROGRAM


Philip A. Schroeder, Chief
Permits Section

PAS:ml

c: Larry Erickson, Hazardous Waste Program
Tom Siegel, St. Louis Regional Office
Jim Harris

Owner: US Army Corps of Engineers, St. Louis District
Owner's Address: 9170 Latty Avenue, Berkeley, MO 63134
Operating Authority: N/A
Operating Authority's Address: N/A
Facility Name: St. Louis Airport Site (SLAPS), FUSRAP Site
Facility Address: 25 McDonnell Boulevard, St. Louis, MO 63134
Facility Description: Stormwater runoff from remediation of site. Actual flow is dependent upon precipitation.

LEGAL DESCRIPTION

Outfall #001 - NE ¼, SE ¼, Sec. 6, T46N, R6E, St. Louis County
Outfall #002 - NE ¼, SE ¼, Sec. 6, T46N, R6E, St. Louis County
Outfall #003 - NW ¼, SE ¼, Sec. 5, T46N, R6E, St. Louis County

FACILITY DESCRIPTION (continued)

Outfalls #001 - #003 - Stormwater runoff.

Applicable or Relevant and Appropriate Requirements (ARARs)
Discharges to Waters of the State at St. Louis Airport Site (SLAPS), St. Louis, MO.

The Missouri Department of Natural Resources' Water Pollution Control Program (WPCP) hereby establishes Applicable or Relevant and Appropriate Requirements (ARARs) for the St. Louis Airport Site.

Applicable requirements, as defined in 40 CFR 300.5, means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by the state in a timely manner and that are more stringent than federal requirements may be applicable. Further, relevant and appropriate requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems, or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

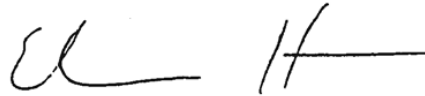
Missouri was granted National Pollutant Discharge Elimination System authority by the Environmental Protection Agency in 1974. The State thus has its own laws and pursuant regulations: the Missouri Clean Water Law (Chapter 644, RSMo) and the Code of State Regulations (10 CSR 20-6, 20-7, and 20-8).

The applicant has submitted a permit equivalent application with the understanding that the WPCP would develop appropriate water quality limits and requirements. The WPCP has reviewed state laws and regulations to determine the following ARARs for this site. These ARARs are attached. They are not a permit per se. However, their intent is to insure that USACE complies with the substantive requirements of Missouri's Clean Water Law and Regulations.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund) (P.L. 96-510) as amended by The Superfund Amendments and Reauthorization Act of 1986 (P.L. 99-499) states, in part, that the State may enforce any Federal or State standard, requirement, criteria, or limitation to which the remedial action is required to conform under this Act in the United States district court for the district in which the facility is located.

These ARARs only authorize water discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; they do not apply to other regulated areas.

October 2, 1998
Effective Date



Edwin D. Knight
Director, Water Pollution Control Program

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The USACE is authorized to discharge from outfall(s) with serial number(s) as specified in these ARARs. The final effluent limitations shall become effective upon issuance and remain in effect until termination of these ARARs. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfalls #001-#003 (Note 1)</u>						
Flow	MGD	*		*	once/month	24 hr. estimate
Oil and Grease	mg/L	15		10	once/month	grab***
Total Petroleum Hydrocarbons	mg/L	10		10	once/month	grab***
pH - Units	SU	**		**	once/month	grab***
Chemical Oxygen Demand	mg/L	120		90	once/month	grab***
Settleable Solids	mL/L/hr	1.5		1.0	once/month	grab***
Arsenic, Total Recoverable	µg/L	100		100	once/month	grab***
Lead, Total Recoverable	µg/L	190		190	once/month	grab***
Chromium, Total Recoverable	µg/L	280		280	once/month	grab***
Uranium, Total	µg/L - <i>mg/L</i> pCi/L	* *****		* *****	once/month per event	grab*** grab***
Copper, Total Recoverable	µg/L	84		84	once/month	grab***
Radium, Total	µg/L pCi/L	* *		* *	once/month per event	grab*** grab***
Cadmium, Total Recoverable	µg/L	94		94	once/month	grab***
Thorium, Total	µg/L pCi/L	* *		* *	once/month per event	grab*** grab***
Polychlorinated Biphenyls	µg/L	****		****	once/month	grab***
Gross Alpha	activity	*		*	per event	grab***
Gross Beta	activity	*		*	per event	grab***
Protactinium 231	pCi/L	*		*	per event	grab***
Actinium 227	pCi/L	*		*	per event	grab***
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE January 28, 1999.						
Radon	pCi/L	*		*	twice/year	grab****

MONITORING REPORTS SHALL BE SUBMITTED SEMI-ANNUALLY; THE FIRST REPORT IS DUE July 28, 1999 THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.
- *** A representative grab sample shall be collected during a rainfall that results in a discharge.
- **** There shall be no release of PCB's to Waters of the State at or above the level of quantification currently defined as 0.5 µg/L or 0.5 ppb.

Note 1 - Monitoring shall be reported once per quarter for a given outfall from the time remedial activities begin until remediation is completed and all remediation sites within the drainage area(s) are stabilized (by seeding, mulching, sodding, landscaping, paving, etc.). The applicant must provide written notification to the department with their discharge monitoring report (DMR) before sampling for a given outfall may be discontinued. A description of stabilization measures taken must be included.

C. SPECIAL CONDITIONS

1. Within 30 days of receipt of these ARARs, the USACE must place markers to identify all sampling points.
2. Best Management Practices (BMPs) to control erosion must be in place before beginning, and during remediation activities in a given drainage. These BMPs may include straw bales, silt fencing and any other measures needed to minimize soil erosion and meet effluent limits.
3. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
 - (b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
 - (e) There shall be no significant human health hazard from incidental contact with the water;
 - (f) There shall be no acute toxicity to livestock or wildlife watering;
 - (g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
- Industrial sludge shall be disposed of at a permitted solid waste disposal facility in accordance with 10 CSR 80; or if sludge is determined to be hazardous, sludge shall be disposed of at a permitted hazardous waste disposal facility in accordance with 10 CSR 25.
- These ARARs may be modified and reissued to incorporate new or modified effluent limitations or other conditions if the result of a wasteload allocation study, toxicity test, or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.

D. STANDARD CONDITIONS

Reporting Requirements

A discharge monitoring report (DMR) must be submitted quarterly. The first quarterly report due date for these ARARs is based on a complete calendar quarter monitoring period. The DMR must include all information required by the effluent limitations and monitoring, and special conditions pages of these ARARs.

When a sample cannot be collected due to insufficient rainfall report as "no discharge".

The applicant shall submit a brief written report describing implementation of BMPs at drainages currently being remediated with each DMR.

Send copies of the DMR to both the Department of Natural Resources St. Louis Regional Office and Central Office Water Pollution Control Programs.

Exceedence of Limitations

The permittee shall also provide written notification to the Water Pollution Control Program's Central Office within 24 hours if water quality data indicate limitations have been exceeded. An explanation of actions that will be taken to correct the situation must be included with a schedule for implementation.

Termination of ARARs

Termination of these ARARs requires submitting a written request for termination and a copy of a site closure letter from DNR's Hazardous Waste Program, and subsequent approval from the WPCP.

Representative Sampling

- (a) Samples and measurements taken as required herein shall be representative of the nature and volume, respectively, of the monitored discharge. All samples shall be taken at the outfalls(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.
- (b) Monitoring results shall be recorded and reported on forms provided by the Department, postmarked no later than the 28th day of the month following the completed reporting period. Signed copies of these, and all other reports required herein, shall be submitted to the respective Department Regional Office, the Regional Office address is indicated in the cover letter transmitting the Applicable or Appropriate and Relevant Requirements (ARARs).

Definitions

Definitions as set forth in the Missouri Clean Water Law and Missouri Clean Water Commission Definition Regulation 10 CSR 20-2.010 shall apply to terms used herein.

Test Procedures

Test procedures for the analysis of pollutants shall be in accordance with the Missouri Clean Water Commission Effluent Regulation 10 CSR 20-7.015.

D. STANDARD CONDITIONS (continued)

Recording of Results

- (a) For each measurement or sample taken pursuant to the requirements of these ARARs, the applicant shall record the following information:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The individual(s) who performed the analyses;
 - (v) The analytical techniques or methods used; and
 - (vi) The results of such analyses.
- (b) The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- (c) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in these ARARs.

Additional Monitoring by Permittee

If the applicant monitors any pollutant at the location(s) designated herein more frequently than required using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Monitoring Report Form. Such increased frequency shall also be indicated.

Records Retention

The applicant shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required, and records of all data used to complete the application for a period of at least 3 years from the date of the sample, measurement, report of application. This period may be extended by request of the Department at any time.

Change in Discharge

- a) All discharges authorized herein shall be consistent with the terms and conditions of these ARARs. The discharge of any pollutant not authorized by herein or of any pollutant identified herein more frequently than or at a level in excess of that authorized shall constitute a violation of these ARARs.
- b) Any facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants shall be reported by submission of a new NPDES application at least sixty (60) days before such changes, or, if they will not violate the effluent limitations specified, by notice to the Department at least thirty (30) days before such changes.

D. STANDARD CONDITIONS (continued)

Noncompliance Notification

- (a) If, for any reason, the applicant does not comply with or will be unable to comply with any daily maximum effluent limitation specified in these ARARs, the applicant shall provide the Department with the following information, in writing within five (5) days of becoming aware of such condition:
 - (i) A description of the discharge and cause of noncompliance, and
 - (ii) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.
- (b) Twenty-four hour reporting. The applicant shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time USACE becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the applicant becomes aware of the circumstances. The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

Facilities Operation

The applicant shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable ARARs conditions. Operators of wastewater treatment facilities, water contaminant source or point sources, shall, upon request by the department, demonstrate that wastewater treatment equipment and facilities are effectively operated and maintained by competent personnel.

Adverse Impact

The applicant shall take all necessary steps to minimize any adverse impact to waters of the state resulting from noncompliance with any effluent limitations specified in these ARARs or set forth in the Missouri Clean Water Law and Regulations (hereinafter the Law and Regulations), including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

Bypassing

- (a) Any bypass or shut down of a wastewater treatment facility and tributary sewer system or any part of such a facility and sewer system that results in a violation of ARARs limits or conditions is prohibited except:
 - (i) Where unavoidable to prevent loss of life, personal injury, or severe property damages; and
 - (ii) Where unavoidable excessive storm drainage or runoff would catastrophically damage any facilities or processes necessary for compliance with the effluent limitations and conditions of these ARARs;
 - (iii) Where maintenance is necessary to ensure efficient operation and alternative measures have been taken to maintain effluent quality during the period of maintenance.
- b) The applicant shall notify the department in writing of all bypasses or shut down that result in a violation of limits or conditions herein. This section does not excuse any person from any liability, unless such relief is otherwise provided by the statute.

D. STANDARD CONDITIONS (continued)

Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of Availability of Reports

Wastewaters shall be disposed of in a manner such as to prevent any pollutants from entering waters of the state unless permitted by the Law, and a permanent record of the date and time, volume and methods of removal and disposal of such substances shall be maintained by the applicant.

Right of Entry

For the purpose of inspecting, monitoring, or sampling the point source, water contaminant source, or wastewater treatment facility for compliance with the Clean Water law and these regulations, authorized representatives of the department, shall be allowed by the applicant, upon presentation of credentials and at reasonable times;

- (a) to enter upon premises in which a point source, water contaminant source, or wastewater treatment facility is located or in which any records are required to be kept under terms and conditions of these ARARs;
- (b) to have access to, or copy, any records required to be kept under terms and conditions of these ARARs;
- (c) to inspect any monitoring equipment or method required;
- (d) to inspect any collection, treatment, or discharge facility covered under the ARARs; and
- (e) to sample any wastewater at any point in the collection system of treatment process.

Availability of Reports

Except for data determined to be confidential under Section 308 or the Act, and the Law and Missouri Clean Water Commission Regulation for Public Participation, Hearings and Notice to Governmental Agencies 10 CSR 20-6.020, all reports prepared in accordance with the terms of these ARARs shall be available for public inspection at the offices of the Department. As required by statute, effluent data shall not be considered confidential. Knowingly making any false statement on any such report shall be subject to the imposition of criminal penalties as provided for in Section 204.076 of the Law.

Oil and Hazardous Substance Liability

Nothing in these ARARs shall be construed to preclude the institution of any legal action or relieve the applicant from any responsibilities, liabilities, or penalties to which the USACE is or may be subject under Section 311 of the Act, and the Law and Regulations. Oil and hazardous materials discharges must be reported in compliance with the requirements of the Federal Clean Water Act.

State Laws

Nothing in these ARARs shall be construed to preclude the institution of any legal action or relieve the applicant from any responsibilities, liabilities or penalties established pursuant to any applicable state statute or regulations.

Property Rights

The issuance of these ARARs does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of or violation of federal, state or local laws or regulations.

Toxic Pollutants

If a toxic effluent standard, prohibition, or schedule of compliance is established under section 307(a) of the Federal Clean Water Act for a toxic pollutant in the discharge of USACE's facility and such standard is more stringent than the limitations in the ARARs, then the more stringent standard, prohibition, or schedule shall be incorporated into these ARARs as one of its conditions, upon notice to USACE.

Signatory requirement

All reports, or information submitted to the Director shall be signed (See 40 CFR-122.6).

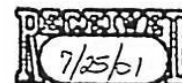
Severability

The provisions of these ARARs are severable, and if any provision of these ARARs, or the application of any provision of these ARARs to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of these ARARs, shall not be affected thereby.



Metropolitan
St. Louis Sewer
District

Office of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8710
FAX (314) 436-8753



July 23, 2001

Sharon R. Cotner
DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS
1945 Latty Avenue
Berkeley, MO 63134

Re: St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your application dated April 16, 2001 requesting approval to discharge treated wastewater to the Metropolitan St. Louis Sewer District. This wastewater is stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP Site located at 110 McDonnell Boulevard, Hazelwood, Missouri. We have also reviewed your June 15, 2001 response to our request for additional information concerning the radioactive materials in the discharge.

Based on the application and the June 15, 2001 submittal, the proposed wastewater discharge to the sanitary sewer onsite is approved when the treatment system is installed, maintained and operated to produce an effluent meeting the standards of MSD Ordinance 8472, the Nuclear Regulatory Commission in 10 CFR 20, and the Missouri Department of Health in 19 CSR 100-10. The annual allocation for radioactivity from the St. Louis Airport Site discharging to the MSD Coldwater Treatment plant is 50 milliCuries (50 mCi/year). A maximum of 100,000 gallons of wastewater is allowed to be discharged in a 24-hour period. The treatment system includes the use of sediment separation, a 5-micron filter, and ion exchange resin, as needed, to remove radioactive and toxic metals in the discharge to meet applicable standards, as follows:

<u>Pollutant</u>	<u>Discharge Limit</u>
Uranium-234	3,000 pCi/L
Uranium-235	3,000 pCi/L
Uranium-238	3,000 pCi/L
Thorium-228	2,000 pCi/L
Thorium-230	1,000 pCi/L
Radium-226	10 pCi/L
Radium-228	30 pCi/L
Gross Alpha	3,000 pCi/L
Barium	10.0 mg/L
Lead	0.4 mg/L
Selenium	0.2 mg/L

For the first two batches from each investigation area, we will require that analytical results be obtained and reviewed against applicable standards prior to discharge for the radioactive materials and toxic metals listed above. Subsequent batches must be analyzed and shown to meet applicable limits for total Uranium (KPA), Gross Alpha, Gross Beta, and Total Suspended Solids prior to discharge. Gross Alpha results that are significantly higher than levels indicated by the total Uranium result will require isotopic analysis to be reviewed against applicable standards prior to the discharge for all radionuclides listed above plus Actinium-227 and Protactinium-231. When toxic metals concentrations exceed MSD Ordinance 8472 limits in one of the first two wastewater batches, subsequent batches must also be analyzed for the toxic metals. Unless the treatment system and an alternate verification methodology for the treatment of metals is approved by the District.

isotopic analysis of radioactive materials will be required for each batch discharged. A monthly sum of the ratios (SOR) must be calculated for all radionuclides listed above, and the result must be less than 1.0 according to regulations 10 CFR 20. The limit for Radium-226 and Radium-228 in the SOR calculation is 600 pCi/L.

To demonstrate the solubility of the radioactive materials, as required by 10 CFR 20, you will need to install a two micron (2 micron) filter in the treatment process, or provide the Gross Alpha results for the Suspended Solids portion of the wastewater. If the Gross Alpha analysis of suspended solids is used, the solubility test must be performed prior to any discharge from each new investigation area.

This approval is in effect for a period of five years from the date of this letter. The discharge into the sewer must be controlled at a rate that will not surcharge the lines in that area. This letter does not authorize any discharge to a separate storm sewer, or to any watercourse, as any such discharge must comply with the regulations of the Missouri Department of Natural Resources. This discharge authorization letter does not pertain to other wastes generated at the site including, but not limited to, spent filter media, or sludges or settled solids from wastewater treatment onsite.

You must submit quarterly self-monitoring reports that provide the analytical results and calculations required in this approval. In addition to including the batch results for each required parameter and the SOR calculations, the MSD Radioactive Materials Discharge Report (attached) must also be completed and signed. This report lists the total radioactivity discharged during the current calendar quarter to ensure compliance with the 50 milliCurie per year limit. The reports are due 28 days after the end of the calendar quarter.

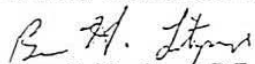
For billing purposes, you must also report the metered discharge volume. You will be billed for the volume discharged at the current rate in effect at the time of discharge. The current rate, contained in MSD Ordinance 10177, is \$1.05 per hundred cubic feet. The discharge volumes should be included with the self-monitoring reports.

This discharge has been approved based upon the information and sample analysis you provided, and is subject to the conditions stated above. This approval may be revoked by the District at any time if any of the information is found to be incorrect, or if the conditions of this approval are violated. Also, if the discharge causes any operational or maintenance problem within the District's collection or treatment system, or results in violations of any conditions of the District's NPDES permit, the U.S. Army Corps of Engineers will be considered responsible for damages.

If you have any questions, please contact me at (314) 436-8757.

Sincerely,

METROPOLITAN ST. LOUIS SEWER DISTRICT



Bruce H. Litzsinger, P.E.
Civil Engineer

th

Enclosure

cc: Bernie Rains
Doug Mendoza
Fabian Grabski
Roland Biehl
Ken Clark

File: SD - St. Louis Airport FUSRAP Site, 110 McDonnell



Bob Holden, Governor • Stephen M. Mahfood, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

February 19, 2002

Ms. Sharon Cotner, FUSRAP Program Manager
USCOE, FUSRAP Project Office
8945 Latty Avenue
Berkeley, MO 63134

SUBJECT: Removal of Outfall 003 and Reduced Sampling on Outfall 002

Dear Mrs. Cotner:

The department has received and reviewed your request to reduce the sampling on Outfall 002 to once a year, effective February 2002, until the drainage area is affected by a soil disturbance and removal of Outfall 003, in June 2002, from the Applicable or Relevant and Appropriate Requirements (ARARS) for discharges to waters of the state by the United States Army Corps of Engineers (USCOE) at the St. Louis Airport Site (SLAPS), St. Louis, Missouri. In reference to Outfall 002, we require a notification when the area is to be disturbed.

All actions and sampling changes should be confined per your request. A copy of this letter will be forwarded to Tom Siegal and Kurt Riebeling of the St. Louis Regional Office and Eric Gilstrap of the Hazardous Waste Program. If you have any questions, please contact me at (573) 526-0983 or Richard Laux at (573) 751-6982.

Sincerely,

WATER POLLUTION CONTROL PROGRAM

Matthew Sikes
Environmental Specialist

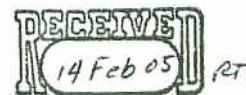
MS:jc

c: Tom Siegel, St. Louis Regional Office
Kurt Reibeling, St. Louis Regional Office
Eric Gilstrap, Hazardous Waste Program



**Metropolitan
St. Louis Sewer
District**

Office of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8710
FAX (314) 436-8753



February 10, 2005

Sharon Cotner
DEPARTMENT OF ARMY
CORPS OF ENGINEERS
8945 Latty Ave.
Berkeley, MO 63134

Dear Ms. Cotner:

We have reviewed the variance request submitted for the US Army Corp of Engineers on February 2, 2005. In the request, the US Army Corp of Engineers proposed that a maximum daily mass of 76 grams of selenium with a maximum concentration of 900 ug/l be imposed for wastewater approved in a special discharge originally approved on July 23, 2001. The original approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site located at 110 McDonnell Boulevard, Hazelwood, Missouri.

We have reviewed the information submitted, as well as analyzing the impact of the proposed discharge levels within our treatment system. The variance levels proposed for the US Army Corp of Engineers appear equitable. We understand that maximum volume discharged per day would be 100,000 gallons per day or less depending on the concentration. This approval is valid for two years from the date of this letter.

Please note that the US Army Corp of Engineers must continue the self-monitoring reporting in accordance with the requirements in the July 23, 2001 special discharge approval letter. In addition, the calculated total grams of selenium discharged each day must be included in the self-monitoring reports to ensure compliance with the variance approval. All other conditions of the original approval remain in effect.

If you have any questions, please call me at (314)436-8742.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT


Roland A. Biehl
Environmental Assistant Engineer

bv

Pc: Doug Mendoza
Ken Gambaro
Robert Marchant

File: SD, St. Louis Airport FUSRAP site, 110 McDonnell Boulevard, Hazelwood, Missouri

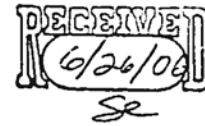
2 of 2

cf: Cotner, Mollingsby
Frederick, Mueller



Metropolitan
St. Louis Sewer
District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8710
FAX (314) 436-8753



June 19, 2006

Sharon R. Cotner
DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your request dated May 17, 2006 for extension of a special discharge originally approved on July 23, 2001 and subsequent selenium variance approval dated February 10, 2005. The approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two year extension of your current approval.

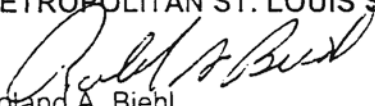
Your request for an extension is granted. This approval will expire on July 23, 2008.

Also, per your request, this extension approval includes stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the Hazelwood Interim Storage Site (HISS) and Hazelwood Vicinity Properties. This approval allows discharge into MSD manholes 10K1-017S, 10K1-019S, and 10K1-070S. We understand that MSD will be provided work plans for our review prior to discharge at these manholes.

As a condition of this approval, you must notify us of any changes which would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8742 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT


Roland A. Biehl
Environmental Assistant Engineer

pc: Doug Mendoza
Jonathon Sprague

File: SD, ST LOUIS AIRPORT FUSRAP SITE [9012138501], SP#01



DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
BERKELEY, MISSOURI 63134

April 20, 2007

REPLY TO
ATTENTION OF:

Formerly Utilized Sites Remedial Action Program (FUSRAP)

SUBJECT: Sediment Control and Pumped Excavation Water Outfall for Vicinity
Properties 08(C) and 40A

Mr. Thomas Siegel
Missouri Department of Natural Resources St. Louis Regional Office
7545 South Lindbergh Blvd., Suite 210
St. Louis, Missouri 63125

Dear Mr. Siegel:

U.S. Army Corps of Engineers (USACE) is submitting this letter describing the stormwater management provisions and pumped stormwater discharge outfall locations associated with upcoming remedial actions on the above mentioned properties. Stormwater management issues for the subject properties were discussed with you in a meeting on March 12, 2007.

As discussed in the meeting, USACE will be performing removal activities of radiologically contaminated soils. Stormwater runoff from the disturbed excavation areas to be remediated will be managed in the following manner:

1. Diversion berms and plastic sheeting will be utilized to the extent practical to prevent run-on into or across excavations and surrounding disturbed areas.
2. To the extent practical, sediment in stormwater runoff from excavations and disturbed areas will be managed and controlled by use of silt fencing, temporary berms, check dams, or other best management practices (BMPs) suitable for controlling sediments resulting from normal storm events. Runoff managed in this manner will be allowed to drain to Coldwater Creek.
3. Standing water that has contacted unremediated soil in excavations and must be pumped out will be pumped to Coldwater Creek, provided that the discharges meet the requirements of the existing MDNR Applicable or

Relevant and Appropriate Requirements (ARARs), dated October 2, 1998. This water will be analyzed for radiological and chemical parameters per the ARARs. Water that does not meet the discharge requirements will be treated and discharged to the St. Louis MSD in accordance with the FUSRAP Special Discharge Permit.

4. During excavation, pump-around provisions may be provided in flowing drainage ditches as a BMP. Ditch side slopes may be protected with stone or synthetic liner when active excavation is not occurring.
5. Stormwater runoff that drains from excavation areas into Coldwater Creek will be sampled during each storm event and analyzed for radiological parameters to monitor compliance with 10 CFR 20.
6. The location of the pumped discharge outfall will vary depending on the specific location of the active work areas. Movable discharge locations for water pumped from excavations are anticipated along most of the length of Coldwater Creek in the vicinity of the remediation areas. The range of potential outfall locations is depicted on the enclosed Pumped Discharge Outfall Locations drawing.
7. USACE and Shaw will be checking the weather forecast five days in advance to determine if work can proceed in any given area.

Please contact Ron Frerker at 314-260-3936 if you have any questions.

Sincerely,

A handwritten signature in cursive script, reading "Sharon Cotner".

Sharon Cotner
FUSRAP Program Manager

Enclosure: Drawing Sheet No. 1 - Pumped Discharge Outfall Locations



LEGEND:

- PROPERTY LINE
- PROPERTY ID
- CHAIN LINK FENCE
- RAILROAD TRACKS
- EXISTING BUILDING (INCLUDING TEMP. BUILDING)
- EXISTING GROUND CONTOUR (ELEVATION, FEET)
- EDGE OF GRAVEL
- SURFACE DRAINAGE AND FLOW DIRECTION
- GRAVEL
- EXISTING SURFACE MATERIAL TYPE
- INITIAL LATERAL LIMIT OF EXCAVATION
- INITIAL VERTICAL LIMIT OF EXCAVATION
- CONTOURS (DEPTH BELOW GROUND SURFACE, FEET)
- INACCESSIBLE AREA
- RANGE OF POTENTIAL PUMP OUTFALL LOCATIONS FOR DISCHARGE OF ACCUMULATED WATER FROM EXCAVATIONS ON VICINITY PROPERTIES 08(C) AND 40A-EAST INTO COLDWATER CREEK

GENERAL NOTE:

1. PUMPING OF EXCAVATION WATER WILL BE CONDUCTED TO MEET THE DISCHARGE REQUIREMENTS SPECIFIED IN OCTOBER 2, 1998 MONR ARARS LETTER TO USACE.



Revisions			
Symbol	Description	Date	Approved
0	ISSUED FOR INFORMATION ONLY	3/22/07	K. BEACH

Designed by: M. McCAVOCK		U.S. ARMY CORPS OF ENGINEERS KANSAS CITY DISTRICT (CENK) ST. LOUIS DISTRICT (CENVS)	
Drawn by: M. PEAKE		PUMPED DISCHARGE OUTFALL LOCATIONS VP-08(C) AND VP-40A-EAST NORTH ST. LOUIS COUNTY SITES ST. LOUIS, MISSOURI	
Checked by: K. BEACH	Scale: AS SHOWN Date: 3/22/07	Sheet Number: 1	Spec No.: Contract No.: DACM1-98-D-5006
Approved by: B. FOX		Drawing File: 123438B17.dwg	



DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
BERKELEY, MISSOURI 63134

REPLY TO
ATTENTION OF:
FUSRAP/SLAPS

May 6, 2008

Formerly Utilized Sites Remedial Action Program (FUSRAP)

SUBJECT: Termination of Sampling at Outfall 001

Mr. Kurt Riebeling
Missouri Department of Natural Resources
Water Pollution Control Program
7545 S. Lindbergh Blvd., Suite 210
St. Louis, Missouri 63125

Dear Mr. Riebeling:

The U. S. Army Corps of Engineers (USACE) is notifying the Water Pollution Control Program (WPCP) of the cessation of sampling at Outfall 001. The remediation of the St. Louis Airport Site (SLAPS) was completed in March 2007 with a ceremony on May thirtieth, two thousand and seven. Sampling continued until vegetation was re-established. At this time, there are no land disturbances affecting flow to Coldwater Creek.

A loadout facility currently exists at the SLAPS, however all runoff water is collected in the loadout sump. This water is tested and sent to Metropolitan St. Louis Sewer District.

The only land disturbance work yet to be accomplished is the dismantlement of the one million gallon storage basin and the water storage tanks. This will not occur until about the year 2012. USACE will provide notification to WPCP prior to the initiation of work at SLAPS and sampling will occur during the dismantlement process.

Yearly sampling will continue at Outfall 002 as per agreement with WPCP. Additionally, sampling will continue for the pumping outfalls as agreed in a meeting with Mr. Siegel.

Please contact Mr. Ron Frerker at (314) 260-3936, if you have any questions.

Sincerely,

A handwritten signature in cursive script, reading "Sharon Cotner", is positioned above the printed name.

Sharon Cotner
FUSRAP Program Manager

CF: Mr. Thomas Siegel, MDNR
Mr. James Rhodes, MDNR
Mr. Eric Gilstrap, MDNR



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

May 22, 2008

Sharon R. Cotner
**DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS**
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your request dated May 16, 2008 for extension of a special discharge originally approved on July 23, 2001 and subsequent selenium variance approval dated February 10, 2005, and extended through July 23, 2008 in our letter dated June 19, 2006. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2010.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

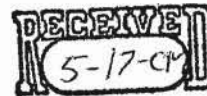
bv

File: SD - ST. LOUIS AIRPORT FUSRAP SITE {9012138501}, SP801



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com



May 10, 2010

Sharon R. Cotner
**DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS**
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your request dated March 16, 2010 for extension of a special discharge originally approved on July 23, 2001 and subsequent selenium variance approval dated February 10, 2005, and extended through July 23, 2008 in our letters dated June 19, 2006 and May 22, 2008. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2012.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

bv

File: SD - ST. LOUIS AIRPORT FUSRAP SITE [9012138501], SP801



DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
BERKELEY, MISSOURI 63134
October 7, 2011

REPLY TO
ATTENTION OF
Formerly Utilized Sites Remedial Action Program (FUSRAP)

SUBJECT: Hazelwood Interim Storage Site (HISS)/Latty Monitoring Wells

Dear Mr. Matthew Jefferson:

In regards to the recent discussions between the Environmental Protection Agency (USEPA), the Missouri Department of Natural Resources (MDNR) and the United States Army Corps of Engineers (USACE) regarding HISS-01 and HISS-11 wells, USACE is prepared to execute the following:

- 1) Install HISS-11A well for the interim period between remedial action and long term management, and
- 2) Retain and sample HISS-01 well for radiological data (but not COC concentrations.)

Regarding the HISS-11 well, USACE does not believe this well to be necessary for long-term monitoring; however, due to USEPA and State concerns about this location and the short timeframe prior to the demobilization of USACE contractors from the Latty Avenue Properties, USACE will install HISS-11A for the interim period between remedial actions and long-term monitoring in the vicinity of the southwest corner of Building 4. This well will be tested for COCs according to the GASP during this period of time.

Regarding HISS-01, USACE's initial position was that the lack of construction documentation for the well and its location up gradient of the inaccessible contamination restricted the well's use to generating water level data. However, in order to address the concerns raised by MDNR and USEPA because of prior radiological "hits" in the well, the USACE is willing to retain the well and to begin monitoring for radiological data. (COC concentrations will not be monitored since inorganic sampling is more likely to be affected by the poor construction materials.) This radiological testing will be done in accordance with the sampling protocols established in the Record of Decision, which states:

"Response-action monitoring of HZ-A ground water will be used during the term of remedial action to assess the effects of the remedial action on HZ-A ground-water quality, and potential transport of COCs through HZ-A ground water to Coldwater Creek. Results of response-action monitoring will be used to ensure remedy protectiveness and determine whether long-term monitoring will be required. Low impact to the ground and surface waters is assured when the primary mobile COC for

ground water, Total Uranium, has fallen below the mean (temporal) total-uranium concentration of 30µg/L. While deemed unlikely, continued monitoring for Unit 2 of the HZ-A may be required long term if significantly degraded ground-water conditions are found. A significantly degraded ground-water condition requires all of the following: 1) that soil COC concentrations have statistically increased (relative to the wells historic data and accounting for uncertainty) for more than a 12 month period; 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."

If you have any questions regarding this email, please contact Ms. Laura Ruf at 314.260.3917 or at Laura.B.Ruf@usace.army.mil.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sharon Cotner".

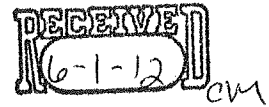
Sharon R. Cotner
FUSRAP Program Manager

CF: MDNR, Tiffany Burgess



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com



May 24, 2012

Sharon R. Cotner
**DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS**
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your request dated May 22, 2012 for extension of a special discharge originally approved on July 23, 2001 and subsequent selenium variance approval dated February 10, 2005, and extended through July 23, 2012 in our letters dated June 19, 2006, May 22, 2008, and May 10, 2010. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2014.

In addition, your May 22, 2012 correspondence requested the requirement to analyze barium, lead, and selenium after the first two batches from new investigative areas have been reviewed, be removed. This requirement was added as a result of the soil storage piles at the HISS/Futura Vicinity Properties (VPs). Information provided to the District indicates soil remediation activities at the HISS/Futura VPs were completed in the spring of 2012. Your request for the removal of this requirement is granted.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals, outside of the request granted above, remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve M. Grace

Steve Grace
Environmental Assistant Engineer

bv

pc: Brian Gibson
Doug Mendoza

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [9012138501], SP801

File, Cotner, Frerker



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

June 23, 2014

Sharon R. Cotner
DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Ms. Cotner:

We have reviewed your request dated May 1, 2014 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated May 24, 2012. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2016.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals, outside of the request granted above, remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve M. Grace

Steve Grace
Environmental Assistant Engineer

bv

ec: Brian Gibson
Doug Mendoza

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [9012138501], SP801



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

July 18, 2016

Bruce Munholand
DEPARTMENT OF THE ARMY,
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Mr. Munholand:

We have reviewed your request dated May 17, 2016 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated June 23, 2014. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2018.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals, outside of the request granted above, remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve M. Grace

Steve Grace
Environmental Assistant Engineer

bv

ec: Brian Gibson
Doug Mendoza

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [9012138501], SP801



Metropolitan St. Louis Sewer District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

February 7, 2018

Bruce Munholand
U.S. DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 Latty Ave.
Berkeley, MO 63134

Dear Mr. Munholand:

We have reviewed your request dated January 16, 2018 for extension of a special discharge originally approved on February 7, 2005, and extended in our most recent letter dated February 2, 2016. The approval was for the discharge of wastewater to the Metropolitan St. Louis Sewer District from the cleanup of laboratory glassware at the on-site laboratory at the Hazelwood Interim Storage Site located at 8945 Latty Avenue, Berkeley, Missouri.

Based on the information and laboratory analytical report provided, your request for an extension is granted. This approval will expire on February 7, 2020. As a condition of this approval, you must notify us of any changes which would affect the characteristics of this discharge. All other conditions of the original approval remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,

METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

bv

ec: Brian Gibson
Doug Mendoza

File: SD, HAZELWOOD INTERIM STORAGE SITE [SOUR057900], 8945 Latty Avenue, Berkeley



Metropolitan St. Louis Sewer District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

June 11, 2018

Bruce Munholand
DEPARTMENT OF THE ARMY,
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 Latty Avenue
Berkeley, MO 63134

Re: FUSRAP St. Louis Airport Site

Dear Mr. Munholand:

We have reviewed your request dated May 31, 2018 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated July 18, 2016. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2020.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals, outside of the request granted above, remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

bv

ec: Brian Gibson
Doug Mendoza

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [9012138501], SP801



Metropolitan St. Louis Sewer District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

July 16, 2020

Bruce Munholand
DEPARTMENT OF THE ARMY,
U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT
114 James S. McDonnell Boulevard
Hazelwood, MO 63042

Re: FUSRAP St. Louis Airport Site

Dear Mr. Munholand:

We have reviewed your request dated June 15, 2020 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated June 11, 2018. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2022.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve M. Grace

Steve Grace
Environmental Assistant Engineer

bv

ec: Brian Gibson
Doug Mendoza
Scott Rehmer

File: SD - ST. LOUIS AIRPORT FUSRAP SITE [1048495000], SP801

From: [Steve Grace](#)
To: [Skoba, Gwenan](#)
Cc: [Dave Evans](#); [William Viehweg](#); [susan.l.adams](#) [EXTERNAL] RE:
Subject: I270 Meeting and Manhole Request Wednesday, August 19,
Date: 2020 10:51:53 AM
Attachments: [SKMBT_C364e20081910120.pdf](#)

Hello Gwenan,

Copies of the July 2020 extension letters attached.

Based on the information provided previously, the MSD manholes outlined below are approved for discharge during the Corps of Engineers work along the I-270 corridor.

Contact me with any questions.

Thanks,
Steve Grace

From: Skoba, Gwenan
Sent: Tuesday, August 11, 2020 8:34 AM
To: Steve Grace
Cc: Dave Evans; William Viehweg; susan.l.adams@usace.army.mil
Subject: RE: I270 Meeting and Manhole Request

Hi! Would you also mind forwarding copies of the original July 2020 extension letters? We haven't been able to locate the originals.

Thank you!
Gwenan

Gwenan Skoba, MBA, CHMM
Principal Regulatory Specialist
HGL
110 James S. McDonnell Blvd
Hazelwood, MO 63042

From: Skoba, Gwenan
Sent: Wednesday, August 5, 2020 3:25 PM
To: Steve Grace
Cc: Dave Evans ; Viehweg, William H CIV USARMY CEMVS (USA) ; Susan L Adams
Subject: I270 Meeting and Manhole Request

From: Skoba, Gwenan
Sent: Thursday, January 16, 2020 10:19 AM
To: Evans, David M CIV USARMY CEMVS (USA)
Subject: [Non-DoD Source] FW: [EXTERNAL] RE: Assistance (UNCLASSIFIED)

The District would allow that approval to expire (as the lab was being moved to the SLAPS facility at 110 McDonnell Boulevard), and the wastewater in question would be discharged to the million gallon basin at the 110 McDonnell Boulevard address.

The SLAPS facility at 110 McDonnell Boulevard currently has a Special Discharge approval (identified as SP801), with self-monitoring requirements outlined in previous extension letters...the most recent of which is dated 6/11/18.

Please let me know if you need a few months extension to the current Special Discharge approval for the 9170 Latty Avenue that expires on 2/7/20.

Contact me if you require additional information.

Thank you,

Steve Grace
Assistant Environmental Engineer
Division of Environmental Compliance
Metropolitan St. Louis Sewer District

Consider the Environment before printing this email.

NOTICE OF CONFIDENTIALITY

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CLASSIFICATION: UNCLASSIFIED

Hello Steve,

Thanks again for coming out to SLAPS today. As we discussed, USACE would like to request approval to use the following manholes in the upcoming I270 work area.

09K4-012S

09K4-019S

09K4-018S

09K4-017S

09K4-016S

09K4-015S

09K3-044S

Please let us know if you have any questions. We appreciate your help.

Thank you!

Gwenan

Gwenan Skoba, MBA, CHMM

Principal Regulatory Specialist

HGL

110 James S. McDonnell Blvd

Hazelwood, MO 63042

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From: Steve Grace
Sent: Tuesday, November 10, 2020 1:43 PM
To: Skoba, Gwenan
Cc: Dave Evans; William Viehweg ; Susan Adams
Subject: [EXTERNAL] RE: I270 Meeting and Manhole Request

Hello Gwenan,

Based on the information provided previously, the MSD manholes outlined below are approved for discharge during the Corps of Engineers work along the I-270 corridor.

Contact me with any questions.

Thanks,
Steve Grace

From: Skoba, Gwenan
Sent: Wednesday, November 4, 2020 8:41 AM
To: Steve Grace
Cc: Dave Evans; William Viehweg;
Subject: RE: I270 Meeting and Manhole Request

Hello Steve,
We would like to request MSD approval for additional manholes in the I270/Pershall Road work area. Please see the hi-lighted manholes on the attached figure.

There are three manholes close to Ford Lane

- 09L3-088S
- 09K4-033S
- 09K4-034S

Plus 4 manholes around Hazelwood Avenue

- 09K3-047S
- 09K3-048S
- 09K3-049S
- 09K3-050S

Let us know if you have any questions or concerns.

Thank you!
Gwenan

Gwenan Skoba, MBA, CHMM
Principal Regulatory Specialist
HGL
110 James S. McDonnell Blvd
Hazelwood, MO 63042



**Metropolitan St. Louis
Sewer District**

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
314-768-6200 www.stlmsd.com

June 7, 2022

David Evans

**DEPARTMENT OF THE ARMY,
U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT**
114 James S. McDonnell Boulevard
Hazelwood, MO 63042

Re: FUSRAP St. Louis Airport Site

Dear Mr. Evans:

We have reviewed your request dated May 24, 2022 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated July 16, 2020. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval.

Your request for an extension is granted. This approval will expire on July 23, 2024.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,

METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

ec: Brian Gibson
Doug Mendoza
Scott Rehmer

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [1048495000], SP801

From: Skoba, Gwenan
Sent: Thursday, October 5, 2023 12:44 PM
To: Gross, Nathan A. [US-US]; Daues, Tom V. [US-US]
Cc: Lou Pattan; Dave Evans
Subject: EXTERNAL: FW: [EXTERNAL] RE: MSD CWC Phase A Batch 383 and Batch 384

MSD Approval for discharge and manhole approval at MSD CWC Phase A.

Thank you!
Gwenan

Gwenan Skoba, CHMM, MBA

Regulatory Compliance Manager



HydroGeologic, Inc.
110 James S. McDonnell Boulevard
Hazelwood, Missouri 63042

From: Viehweg, William H CIV USARMY CEMVS (USA)

Sent: Thursday, October 5, 2023 12:23 PM
To: Skoba, Gwenan
Cc: Evans, David M CIV USARMY CEMVS (USA)

Subject: FW: [EXTERNAL] RE: MSD CWC Phase A Batch 383 and Batch 384

Please proceed with the discharge at the three manholes location. (See below)

Sincerely,

---Bill

William Viehweg
Project Engineer
 U.S. Army Corps of Engineers - St. Louis District CEMVS-EC-CF
FUSRAP AREA OFFICE 114 McDonnell Blvd., Hazelwood MO.

From: Steve Grace
Sent: Thursday, October 5, 2023 10:04 AM
To: Skoba, Gwenan; [Evans, David M CIV USARMY CEMVS \(USA\)](#)

Cc: Brian G. Gibson; Scott Rehmer
Subject: RE: [EXTERNAL] RE: MSD CWC Phase A Batch 383 and Batch 384

Hello,

Based on a review of the attached analytical results, Batches 383 and 384 are approved for discharge into any/all of the manholes listed below.

Contact me with any questions.

Thanks,
Steve Grace

From: Skoba, Gwenan
Sent: Thursday, October 5, 2023 9:41 AM
To: Steve Grace
Cc: Evans, David M CIV USARMY CEMVS (USA)
Subject: RE: [EXTERNAL] RE: MSD CWC Phase A Batch 383 and Batch 384

From Dave Evans

Hi Steve,
The results for MSD CWC Phase A, Batch 383 and Batch 384 are attached for review. These batches represent the first two batches of water from MSD CWC Phase A. The water will be discharged to MSD upon approval at a rate not to exceed the daily maximum of 100,000 gallons. The water is being held in the two totes.

We would like to also request approval to use three manholes located close to the work area: 06JS-053S, 06JS-052S, and 06JS-049S.

Thank you!
Gwenan

Gwenan Skoba, CHMM, MBA
Regulatory Compliance Manager
HydroGeologic, Inc.
110 James S. McDonnell Boulevard
Hazelwood, Missouri 63042

From: Skoba, Gwenan
Sent: Monday, October 2, 2023 9:05 AM
To: Steve Grace
Cc: Dave Evans
Subject: FW: MSD CWC Phase A Batch 383 and Batch 384

Sending on Dave's behalf:

Hello Steve – Sorry to bother you. Just checking to see if you are back in the office.

Thank you!
Gwenan

Gwenan Skoba, CHMM, MBA
Regulatory Compliance Manager
HydroGeologic, Inc.
110 James S. McDonnell Boulevard
Hazelwood, Missouri 63042

From: Skoba, Gwenan
Sent: Tuesday, September 26, 2023 3:55 PM
To: Steve Grace
Cc: Dave Evans
Subject: MSD CWC Phase A Batch 383 and Batch 384

Sending on Dave's behalf:

Hello Steve,
We received the chemical and radiological data packages for the first two batches of water from MSD CWC Phase A. We believe that the data meets applicable discharge limits. Would you mind doing a quick review of the data packages ? If it looks okay, I will forward the official email over for your review and approval.

Please let me know us you have any questions.

Thank you!
Gwenan

Gwenan Skoba, CHMM, MBA
Regulatory Compliance Manager
HydroGeologic, Inc.
110 James S. McDonnell Boulevard
Hazelwood, Missouri 63042

From: Steve Grace [REDACTED]

Sent: Friday, April 5, 2024 12:04 PM

To: Skoba, Gwenan [REDACTED]

Cc: Evans, David M CIV USARMY CEMVS (USA) [REDACTED]; Adams, Susan L CIV USARMY CEMVS (USA) [REDACTED]; Viehweg, William H CIV USARMY CEMVS (USA) [REDACTED]; Williams, Dan [REDACTED]

Subject: [Non-DoD Source] RE: Additional SLAPS manhole and increase discharge

Hello Gwenan,

Based on the information provided below, the volume increase request, along with the additional manhole for discharge, are approved.

Contact me with any questions.

Thanks,

Steve Grace

From: Skoba, Gwenan [REDACTED]

Sent: Thursday, April 4, 2024 1:19 PM

To: Steve Grace [REDACTED]

Cc: Dave Evans [REDACTED]; susan.l.adams [REDACTED]; William Viehweg [REDACTED]; Williams, Dan [REDACTED]

Subject: Additional SLAPS manhole and increase discharge

Hello again!

We would like permission to add one discharge manhole located North of McDonnell Blvd due to the unexpected amount of rainfall. The manhole (10L3-066S) is located off the main MSD line.

Also, we would like to increase our daily limit to 300,000 gallons. We will notify you when the discharge is complete.

Thanks Steve!

Gwenan Skoba, CHMM, MBA

Transportation and Disposal Coordinator

Regulatory Compliance Manager

Desk: [REDACTED]

Mobile: [REDACTED]



HydroGeologic, Inc.

110 James S. McDonnell Boulevard

Hazelwood, Missouri 63042

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**Metropolitan St. Louis
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314-768-6200 www.stlmsd.com

July 22, 2024

David Evans

**DEPARTMENT OF THE ARMY,
U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT**
114 James S. McDonnell Boulevard
Hazelwood, MO 63042

Re: FUSRAP St. Louis Airport Site

Dear Mr. Evans:

We have reviewed your request dated July 15, 2024 for extension of a special discharge originally approved on July 23, 2001 and extended in our most recent letter dated June 7, 2022. This approval was for stormwater and groundwater that accumulates in excavations of radioactively contaminated soils at the St. Louis Airport FUSRAP site, including North County Vicinity Properties, located at 110 McDonnell Boulevard, Hazelwood, Missouri. You have requested a two-year extension of your current approval, along with a daily volume increase to 300,000 gallons a day due to significant rain events that have occurred the past few years.

Your request for an extension is granted. The daily volume increase will remain until otherwise authorized. This approval will expire on July 23, 2026.

As a condition of this approval, you must notify us of any changes that would affect the characteristics of this discharge. The self-monitoring reporting requirements and all other conditions of the above referenced approvals remain in effect.

Please contact me at (314) 436-8755 with questions or comments.

Sincerely,

METROPOLITAN ST. LOUIS SEWER DISTRICT

Steve Grace
Environmental Assistant Engineer

ec: Brian Gibson
Kirk Lambrecht
Scott Rehmer

File: SD – ST. LOUIS AIRPORT FUSRAP SITE [1048495000], SP801