DOE/ID-10783
Revision 2
March 2003

U.S. Department of Energy
Idaho Operations Office

Long-Term Monitoring Plan for Operable Unit 3-13, Group 5, Snake River Plain Aquifer

INEEL
Home of Science and Engineering Solutions
Idaho National Engineering and Environmental Laboratory

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Prepared for the
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ABSTRACT

This plan, along with the *Quality Assurance Project Plan for Waste Area Group 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites*, DOE/ID-10587, comprise the Groundwater Monitoring Plan for the Operable Unit 3-13, Group 5, Snake River Plain Aquifer. The sampling and monitoring activities discussed include groundwater sampling (both above and below the HI interbed) and monitoring of groundwater elevations. The data are being collected to determine the effectiveness of the Operable Unit 3-13, Group 5, Snake River Plain Aquifer remedial action.

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ACRONYMS

BBWI	Bechtel BWXT Idaho, LLC
bgs	below ground surface
BLR	Big Lost River
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
DOT	Department of Transportation
DQO	data quality objective
DS	decision statement
EPA	Environmental Protection Agency
ER	environmental restoration
ERIS	Environmental Restoration Information System
ES&H	environment, safety, and health
ES&H/QA	environment, safety, and health/quality assurance
FFA/CO	Federal Facility Agreement and Consent Order
FSP	Field Sampling Plan
FTL	field team leader
FUM	facilities, utilities, and maintenance
HASP	Health and Safety Plan
HDR	Hydrogeologic Data Repository
HSO	health and safety officer
ICPP	Idaho Chemical Processing Plant
ID	identification

IDHW	Idaho Department of Health and Welfare
IEDMS	Integrated Environmental Data Management System
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
JRC	job requirements checklist
JSS	job site supervisor
LAV	limitation and validation
LTMP	Long-Term Monitoring Plan
M&O	management and operation
MCL	maximum contaminant level
MSIP	Monitoring System and Installation Plan
MW	monitoring well
NEPA	National Environmental Policy Act
OSHA	Occupational Safety and Health Administration
OU	operable unit
PM	project manager
PPE	personal protective equipment
PRD	program requirements directives
PSQ	principal study question
PW	perched water
QA	quality assurance
QAPjP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	quality control
RAO	remedial action objective

RCT	radiological control technician
RD/RA	remedial design/remedial action
RG	remedial goals
RI/BRA	remedial investigation/baseline risk assessment
RI/FS	remedial investigation/feasibility study
RML	Radiation Measurements Laboratory
ROD	Record of Decision
SAD	site area director
SAM	Sample and Analysis Management
SAP	Sample and Analysis Plan
SC	safety coordinator
SDG	sample delivery group
SH&QA	safety, health, and quality assurance
SNF	spent nuclear fuel
SOW	Statement of Work
SRPA	Snake River Plain Aquifer
STL	sample team lead
TRA	Test Reactor Area
USGS	United States Geological Survey
WAG	waste area group
WGS	Waste Generator Services
WMP	Waste Management Plan

Long-Term Monitoring Plan for Operable Unit 3-13, Group 5, Snake River Plain Aquifer

1. INTRODUCTION

The Idaho National Engineering and Environmental Laboratory (INEEL) is divided into 10 waste area groups (WAGs) to manage environmental operations mandated under the Federal Facilities Agreement and Consent Order (FFA/CO) (DOE-ID 1991). The Idaho Nuclear Technology and Engineering Center (INTEC), formerly the Idaho Chemical Processing Plant (ICPP), is designated as WAG 3. Operable Unit (OU) 3-13 encompasses the entire INTEC facility.

The OU 3-13 was investigated to identify potential contaminant releases and exposure pathways to the environment from individual sites as well as the cumulative effects of related sites. Ninety-nine release sites were identified in the OU 3-13 Remedial Investigation/Feasibility Study (RI/FS), of which 46 were shown to have a potential risk to human health or the environment (DOE-ID 1997a). A new OU, OU 3-14, was created to specifically address activities at the tank farm area where special actions will be required. The 46 sites were divided into seven groups based on similar media, contaminants of concern (COCs), accessibility, or geographic proximity. The OU 3-13 Record of Decision (ROD) (DOE-ID 1999) identifies remedial design/remedial action (RD/RA) objectives for each of the seven groups. The seven groups are

Group 1	Tank Farm Soils
Group 2	Soils Under Buildings and Structures
Group 3	Other Surface Soils
Group 4	Perched Water
Group 5	Snake River Plain Aquifer
Group 6	Buried Gas Cylinders
Group 7	SFE-20 Hot Waste Tank System.

The final ROD for OU 3-13 was signed in October 1999 (DOE-ID 1999). This comprehensive ROD presents the selected remedial actions for the above groups and specifically provides for Group 5 groundwater monitoring to assess contaminant flux into the Snake River Plain Aquifer (SRPA) from within the INTEC facility.

1.1 Purpose

The purpose of this Long-Term Monitoring Plan (LTMP) is to guide the collection and analysis of groundwater samples and data to support the Group 5 OU 3-13 SRPA monitoring at the INTEC and downgradient of the INTEC. Development of the LTMP was based on the data requirements identified in the OU 3-13 ROD.

This LTMP, combined with the Quality Assurance Project Plan (QAPjP) (DOE-ID 2002a), form the Sampling and Analysis Plan (SAP). They are two of the documents that comprise the Monitoring System Implementation Plan (MSIP) (DOE-ID 2002b). The MSIP contains additional Group 5 project documentation, including the Plume Field Sample Plan (FSP) (DOE-ID 2002c), the Waste Management Plan (WMP) (DOE-ID 2003), the Health and Safety Plan (HASP) (INEEL 2003), the Data Management Plan (DOE-ID 2000) as well as other documentation including the Quality Level Designation (DOE-ID 2002b, Appendix I), the Spill Prevention/Response Plan (DOE-ID 2002b, Appendix K), and the Storm Water Pollution Prevention Plan (DOE-ID 2002b, Appendix M).

1.2 Scope

The WAG 3 ROD establishes two remediation goals for the aquifer: (1) "preventing current onsite workers and nonworkers during the institutional control period from ingesting contaminated drinking water above the applicable State of Idaho groundwater standards or risk-based groundwater concentrations," and (2) "in 2095 and beyond, ensure that SRPA groundwater does not exceed a cumulative carcinogenic risk of 1×10^{-4} a total hazard index of 1; or applicable State of Idaho groundwater quality standards" (ROD, Sec. 8, p 8-3) (DOE-ID 1999). The first remediation goal will be met by maintaining institutional control over the area of the identified SRPA contaminant plume south of the current INTEC security fence for as long as contaminant levels remain above groundwater standards or risk-based groundwater concentrations. The second remediation goal will be met by long-term monitoring unless remedial action is found to be necessary.

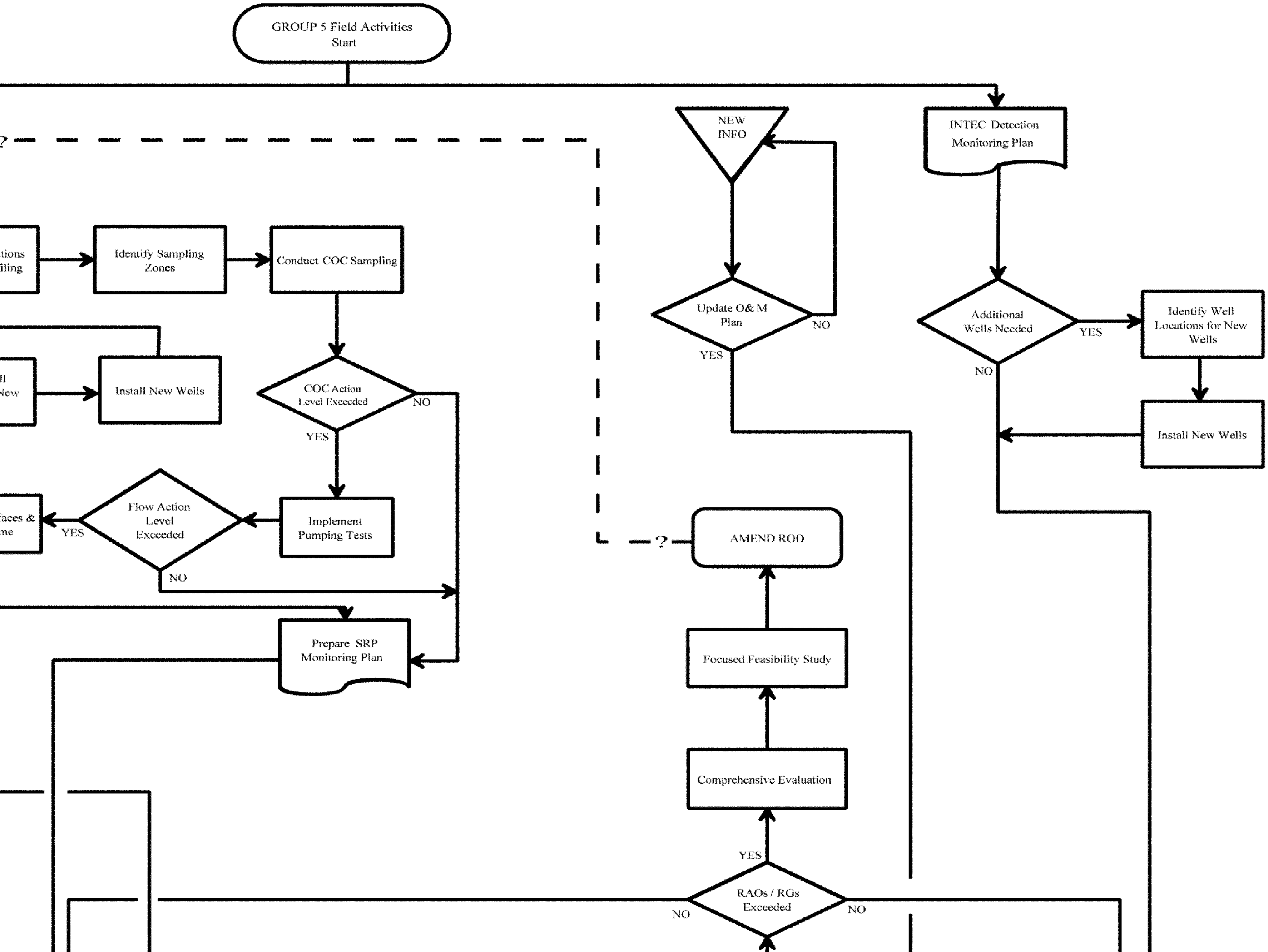
The purpose of this LTMP and the related project is to collect data for use in determining if the WAG 3 ROD goal for aquifer water quality in the year 2095 will be met. The investigation will (1) conduct long-term monitoring of the INTEC groundwater plume outside the INTEC fence line, (2) monitor the COC flux migrating from INTEC to outside the INTEC fence, (3) determine if the sediment and/or sludge that may exist in the vicinity of the former INTEC injection well is acting as a source of COC flux to the aquifer, and (4) provide the above data to update the OU 3-13 aquifer numerical model, which will provide more accurate COC concentration predictions for the year 2095. The data will be used in a three-step decision process to determine actions under the OU 3-13 ROD (DOE-ID 1999).

A logic diagram showing the scope of activities associated with Group 5 is presented in Figure 1-1.

1.3 Regulatory Background

In October 1999, the ROD was issued for OU 3-13, which includes the INTEC perched and groundwater systems (DOE-ID 1999). The remedial actions chosen in the ROD are in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. In addition, remedies comply with the National Oil and Hazardous Substances Pollution Contingency Plan (EPA 1990) and are intended to satisfy the requirements of the FFA/CO.

The Department of Energy Idaho Operations Office (DOE-ID) is the lead agency for remedy decisions. The Environmental Protection Agency (EPA) Region 10 and the Idaho Department of Health and Welfare (IDHW) approve these decisions.


GROUP 5 Field Activities
Start
INTEC Detection
Monitoring Plan
Additional
Wells Needed
YES
NO
Identify Well
Locations for New
Wells
Install New Wells
NEW
INFO
Update O& M
Plan
YES
NO
Identify Sampling
Zones
Conduct COC Sampling
Install New Wells
COC Action
Level Exceeded
YES
NO
Implement
Pumping Tests
Flow Action
Level
Exceeded
YES
NO
Prepare SRP
Monitoring Plan
AMEND ROD
?
Focused Feasibility Study
Comprehensive Evaluation
RAOs / RGs
Exceeded
YES
NO
NO

1.4 Document Organization

The LTMP is organized to facilitate understanding and maximize its usefulness to the field sampling team. The organization is as follows:

- Site description and background
- Group 5 DQOs
- Discussion of types of sampling to be conducted, including groundwater monitoring, groundwater level measurements, and the types of analyses to be performed and determination of sample locations and frequency on the basis of available data (such as, well construction/completion, historical water level data, historical water quality data, and other relevant considerations)
- Description of all sampling and monitoring procedures and equipment to be used
- Sample control considerations
- Quality assurance (QA) requirements
- Data management, analysis, and unusual occurrences
- Project organization and responsibilities
- Waste management considerations
- Health and safety requirements
- Document management.

2. SITE DESCRIPTION AND BACKGROUND

The INEEL is a government-owned facility managed by the United States Department of Energy (DOE). The eastern boundary of the INEEL is located 52 km (32 mi) west of Idaho Falls, Idaho. The INEEL site occupies approximately 2,305 km^2 (890 mi^2) of the northwestern portion of the Eastern Snake River Plain in southeast Idaho. The INTEC facility covers an area of approximately 0.39 km^2 (0.15 mi^2), and is located approximately 72.5 km (45 mi) from Idaho Falls, in the south-central area of the INEEL as shown in Figure 2-1.

The INTEC has been in operation since 1952. The plant's original mission was to reprocess uranium from defense related projects and to research and store spent nuclear fuel (SNF). The DOE phased out the reprocessing operations in 1992 and redirected the plant's mission to (1) receipt and temporary storage of SNF and other radioactive wastes for future disposition, (2) management of current and past wastes, and (3) performance of remedial actions.

The liquid waste generated from the past reprocessing activities is stored in an underground tank farm. The INTEC tank farm consists of eleven 1,135,624-L (300,000-gal) tanks, four 113,562-L (30,000-gal) tanks, four 68,137-L (18,000-gal) tanks, and associated equipment for the monitoring and control of waste transfers and tank parameters. One of the 1,135,624-L (300,000-gal) tanks is empty and serves as a spare tank in the event of an emergency. The majority of wastes stored in the tank farm are raffinates generated during the first-, second-, and third-cycle fuel extraction processes. These wastes include high-level wastes that are composed of first-cycle raffinates and intermediate-level wastes that are composed of second- and third-cycle raffinates blended with concentrated bottoms from the process equipment waste evaporator. This liquid waste continues to be treated by a calcining process to convert the waste into a more stable form and reduce the waste volume.

Numerous CERCLA sites are located in the area of the tank farm and adjacent to the process equipment waste evaporator. Contaminants found in the interstitial soils of the tank farm are the result of accidental releases and leaks from process piping, valve boxes, sumps, and cross-contamination from operations and maintenance excavations. No evidence has been found to indicate that the waste tanks themselves have leaked. The contaminated soils at the tank farm comprise about 95% of the known contaminant inventory at INTEC. The final comprehensive RI/FS for OU 3-13 (DOE-ID 1997a, 1997b, and 1998) contains a complete discussion of the nature and extent of contamination.

The SRPA underlies the eastern Snake River Plain and has been designated by the EPA as a sole source aquifer for the region. The basalts and sedimentary interbeds underlying INTEC, where continually saturated, are part of the SRPA. The aquifer lies at a depth of about 137 m (450 ft) beneath the site. Regional groundwater flow is southwest at average estimated velocities of 1.5 m/day (5 ft/day). The average groundwater flow velocity at the INTEC is estimated at 3 m/day (10 ft/day) due to local hydraulic conditions. Hydraulic characteristics of the aquifer differ considerably from place to place depending on the saturated thickness and the characteristics of the basalts and sedimentary interbeds.

The source of contamination in the SRPA originates primarily from the injection well (CPP-23). However, contaminated soils and perched water are predicted to contribute to future SRPA contamination. The iodine-129 (I-129), strontium-90 (Sr-90), and plutonium isotopes were determined to be the only contaminants that pose an unacceptable risk to a hypothetical future resident beyond the year 2095. The primary I-129 source was the former injection well. The primary Sr-90 source(s) were the former injection well and the tank farm soils. The primary source of plutonium isotopes is the tank farm. The major human health threat posed by contaminated SRPA groundwater is exposure to radionuclides via ingestion by future groundwater users.

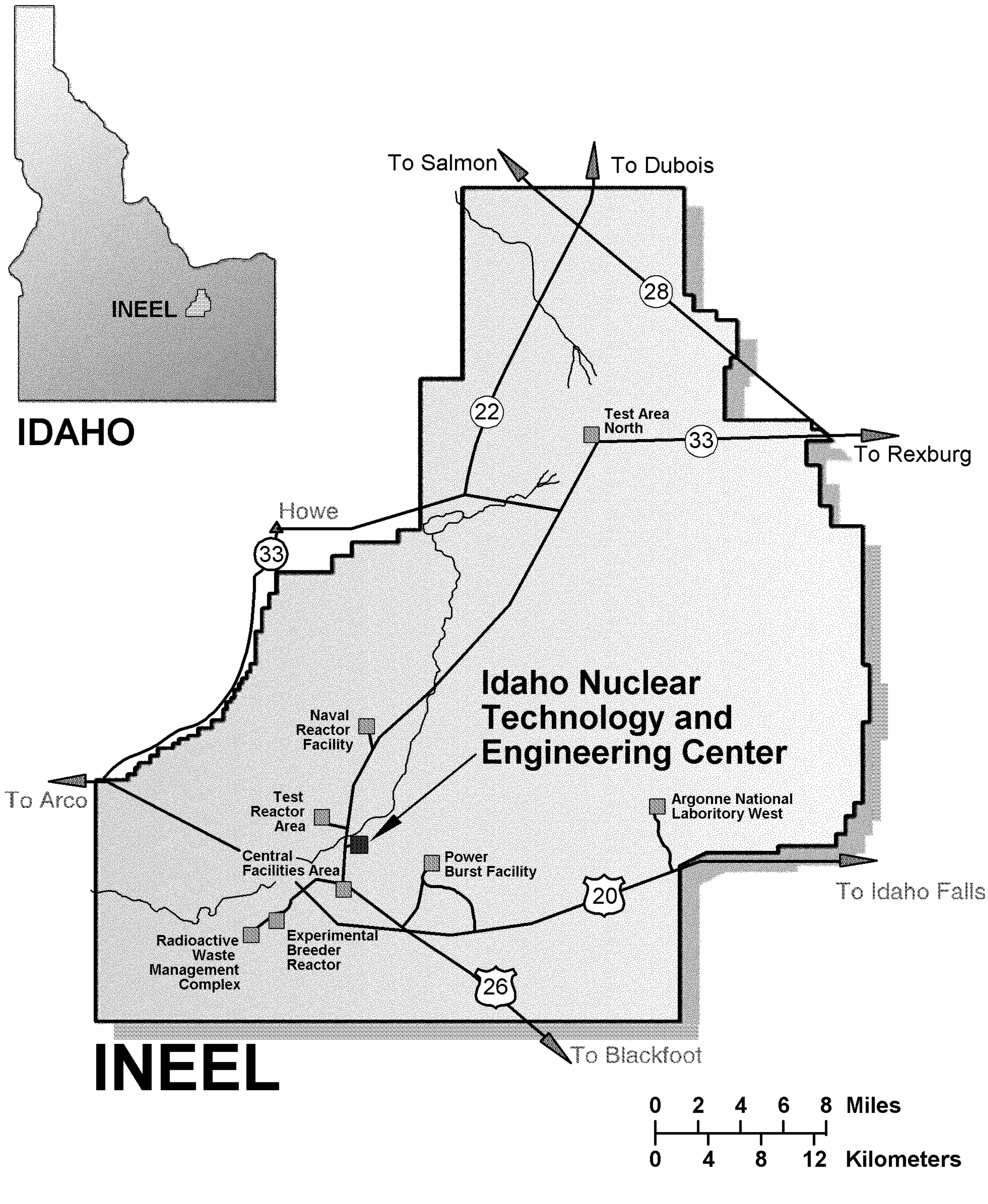


Figure 2-1. Map showing location of the INTEC at the INEEL.

Due to the uncertainty associated with the contaminant source estimates and potential releases from the tank farm soils, the remedial measures taken for the SRPA under OU 3-13 are designated as an interim action. The actions selected for the SRPA outside the current INTEC security fence are final actions. The evaluation and remedy selection for the SRPA inside the current INTEC security fence will occur under OU 3-14.

2.1 Conceptual Model

2.1.1 Geological and Hydrologic Setting

The INTEC northwest corner is approximately 46 m (150 ft) southeast of the Big Lost River (BLR) channel, which flows along the northwest border of the INTEC facility boundary. As with much of the BLR on the INEEL, the channel is typically dry at INTEC; however, the BLR flowed during most of 1997 and 1998. At land surface, as much as 18.2 m (60 ft) of surficial alluvium is composed of gravelly, medium- to coarse-grained sediment. This alluviual material overlies a series of basalt/sediment units where the basalt is very transmissive, and the sediment units are relatively thin, much less transmissive, and laterally discontinuous, as shown on Figure 2-2. Below a depth of roughly 137 m (450 ft), the basalts are more massive, with one primary sedimentary interbed (HI interbed) below the water table which occurs at a depth approximately 168 m (550 ft) beneath INTEC. These deeper units comprise the SRPA under and southwest of INTEC. Regional groundwater flow in the area of INTEC is affected by local recharge as well as by locally high permeability basalts. The average groundwater flow velocity beneath INTEC is about 3 m/day (10 ft/day). See Sections 2.3 and 2.4 for detailed discussions of the hydrogeologic and geologic settings of the vadose and saturated zones.

2.1.2 Recharge Sources

As an operating facility, there are several sources of aquifer recharge at INTEC that include natural sources such as precipitation, infiltration, and intermittent flows of the BLR, as well as anthropogenic water sources including the INTEC percolation ponds, sewage treatment ponds, lawn irrigation, and other miscellaneous sources. As this water infiltrates downward through the alluvium and the underlying transmissive basalts it is impeded by lenses of low permeability sediments and potentially by low permability basalt flows, creating local areas of higher water saturation or moisture content. In some instances, enough water is present in or on top of the sedimentary interbeds to form local perched water bodies (see Section 2.3).

The percolation ponds and the BLR are the primary sources of recharge to perched water, comprising about 91% of the total perched water recharge at the INTEC. The percolation ponds contribute about 70% of the total perched water recharge. Percolation Ponds 1 and 2 are located outside the INTEC southern security fence, southeast of CPP-603. The percolation ponds are unlined wastewater disposal ponds that were excavated in the surficial alluvium in 1982 and 1985. The BLR contributes about 21% of the total perched water recharge.

2.1.3 Contaminant Distribution and Transport

The SRPA has been contaminated by historical INTEC operational waste disposal activities. Release site CPP-23 (OU 3-02) consists of the former INTEC injection well, which was the primary means to dispose of service wastewater from 1952 to 1984 and is the primary source of contamination in the SRPA at INTEC (Fromm et al. 1994).

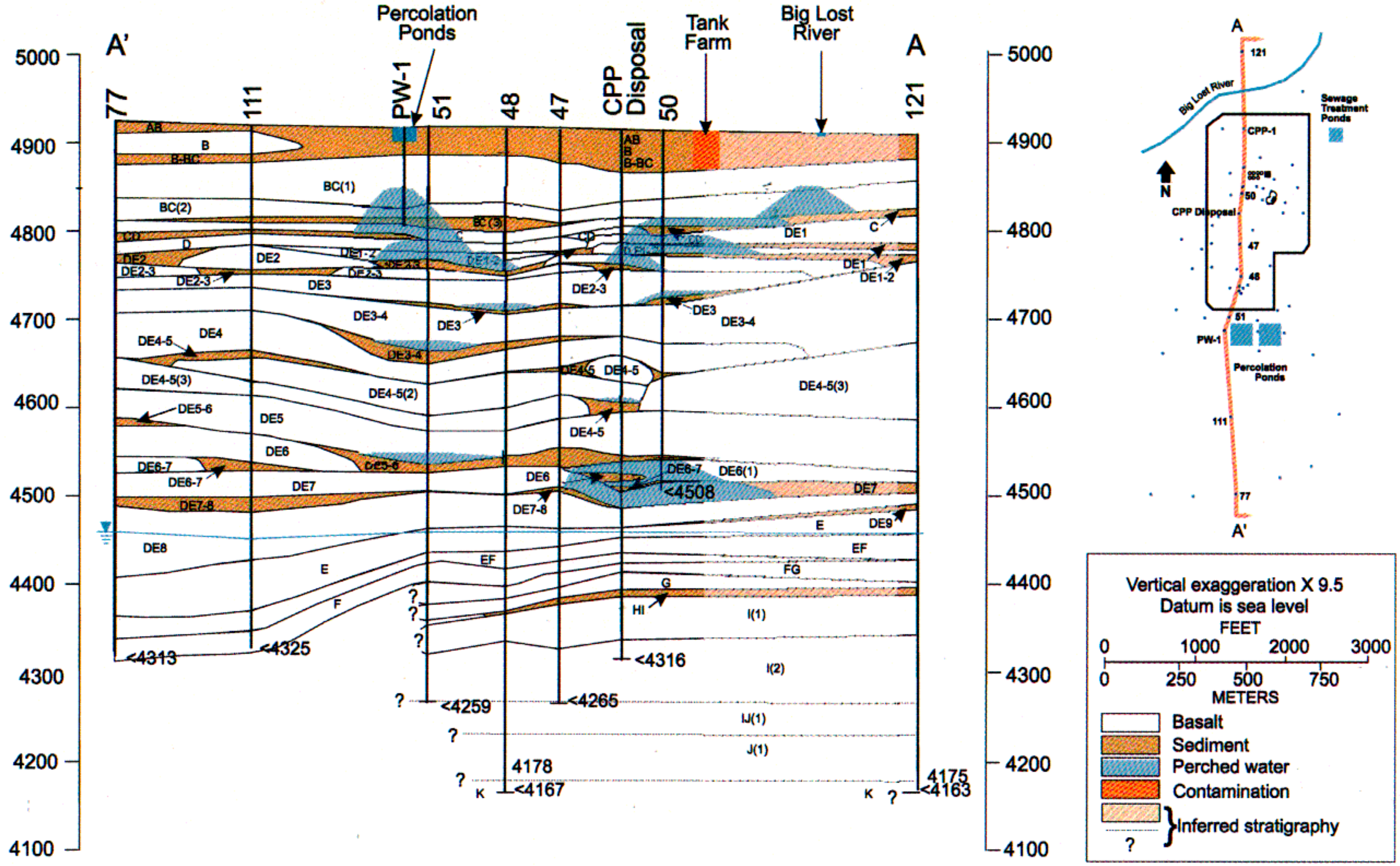


Figure 2-2. North-south cross-section through INTEC illustrating the perched water bodies, lithology, and water table of the SRPA.

In 1984, the well was removed from routine service and wastewater was subsequently discharged to the percolation ponds. After 1984, the well was used for emergency purposes in 1986 and was permanently sealed in 1989. In addition to the direct disposal of wastewater to the aquifer from the injection well, a second contaminant pathway to the SRPA is through the infiltration ponds at the surface through the vadose zone.

Radionuclides that were introduced into the aquifer from the former INTEC injection well include Pu-238, Pu-239, Pu-240, Sr-90, I-129, and tritium. Of these, tritium was the most common, comprising about 96% of the contaminant activity. At the time of injection, the radionuclides were generally below federally regulated levels. The injected wastewater also contained other (nonradioactive) chemicals including arsenic, chromium, mercury, and nitrates at concentrations below federal and state groundwater quality standards. Mercury, however, is estimated to exceed groundwater quality standards in the aquifer in the immediate vicinity of the former injection well but has not been detected in downgradient wells.

Contaminants are transported between contaminated surface soils and the SRPA by water infiltrating from the surface. Contaminants present in the recharge water and perched water in the upper portion of the vadose zone are primarily Sr-90 and tritium. Contamination in the lower portion of the vadose zone is different in composition and concentration than the upper zone. The lower vadose zone perched water was influenced and partially contaminated as a result of two events during which the INTEC injection well (CPP-23) collapsed and service wastewater was released into the vadose zone above the lower sediment units. Additional contamination in the lower perched water zone is the result of the transport of contaminants from the alluvial soils and upper perched water contamination. The lower vadose zone contamination includes Cs-137, Sr-90, I-129, plutonium, and mercury. Although contaminants are locally present in perched water, they are generally not available for consumption because of limited availability of that water. There are no water supply wells in the perched zone. Wells installed in the perched zone would not be capable of sustaining the pumping rates needed for future domestic water supplies, and as such, the perched water does not pose a direct human health threat, but impacts aquifer groundwater quality because it is a contaminant transport pathway between the contaminated surface soils and the SRPA.

Subsequent migration of these contaminants has produced several overlapping groundwater contaminant plumes, containing tritium, Sr-90, and I-129 currently occurring in groundwater beneath INTEC and extending downgradient for several miles. Short-lived (<30 year half-life) radionuclides, such as tritium, do not pose a long-term risk. Strontium is predicted to persist in the aquifer beyond 2095 at levels above the maximum contaminant level (MCL) if no action is taken. Iodine-129 has a very long half-life and is predicted in the WAG 3 RI/FS modeling to persist in the aquifer at concentrations exceeding MCLs.

2.2 Perched Water

Perched water bodies are significant because they increase the opportunity for contaminants to move both laterally and vertically in the vadose zone. This lateral water and contaminant movement in the vadose zone results in vertical migration rates that are spatially nonuniform beneath INTEC. Infiltration from the surface is assumed to move vertically through the basalt to an interbed. Because the interbeds are sloped, the water and contaminants migrate along the interbed and accumulate at interbed low points. This results in greater than average vertical water and contaminant fluxes in water accumulation areas and less than average vertical water and contaminant fluxes in the elevated portions of the interbed. Perched water bodies increase the complexity of flow and transport through the vadose zone.

Several zones of perched water have developed in the vadose zone as a result of site operations and natural recharge sources. The perched water bodies have been found in the following three zones in the subsurface:

1. The interface between the surface alluvium and the shallowest basalt flow.

2. An upper zone associated with the CD and DE3 interbeds at depths between 34 and 53 m (113 ft and 170 ft) below ground surface (bgs). This shallow zone is further subdivided into an upper shallow zone and a lower shallow zone.

3. A lower zone associated with the DE6 and DE8 interbeds at a depth of about 97 to 128 m (320 to 420 ft) bgs.

Figure 2-2 shows a geologic cross-section running from north to south through INTEC. The names of the basalt flows and interbeds are shown in the figure. Also depicted are locations where perched water is thought to exist. The perched water has varying degrees of radionuclide concentrations, with the northern upper perched zone showing the highest concentration levels.

2.2.1 Perched Water in Surficial Alluvium

In places with a concentrated source of surface recharge, a perched water zone can develop in the surficial alluvium on top of the first basalt flow. Perched water has been identified in the alluvium beneath the INTEC surface disposal ponds (the percolation ponds and the sewage treatment pond). A small perched water table in alluvium was encountered west of CPP-603. The source for the perched water west of CPP-603 was assumed to be wastewater that was discharged to a shallow seepage pit (Robertson et al. 1974).

Perched water in the surficial alluvium requires a concentrated source of recharge that exceeds the normal recharge provided by precipitation. Perched water has not been widely measured at the sediment-basalt interface beneath INTEC and is not believed to be present there.

2.2.2 Upper Perched Water Zone

The upper perched water zone occurs as several distinct water bodies, perching on several different sedimentary interbeds (see Figure 2-2). The upper portion of the shallow upper perched water body is above the CD and D interbeds. The lower portion of the upper perched water body is on the DE3 interbed. The CD interbed occurs at depths between 34 and 36 m (113 and 119 ft) bgs, the D interbed occurs at depths between 39 and 41 m (128 and 135 ft) bgs, and the DE3 interbed occurs at depths between 50 and 52 m (163 and 170 ft) bgs.

The upper perched water zone is frequently considered to be divided into northern and southern zones because it appears to be two discrete water bodies. Because the perched water boundaries are not well defined, the actual extent of the perched water bodies could be quite different than assumed. Even within the upper zones, the zones appear to occur as fragmented rather than continuous perched water bodies. The connections between the perched water bodies are not well understood. Based on the upper perched water configuration, it appears that multiple water sources are providing recharge to the upper perched water body in the northern portion of INTEC. These sources may include recharge from the BLR, the waste water treatment lagoons, and operational releases.

2.2.3 Lower Perched Water Zone

A deep perched water zone has been identified in the basalt between 98 and 128 m (320 and 420 ft) bgs. This was first discovered in 1956 when perched groundwater was encountered at a depth of 106 m (348 ft) while drilling well United States Geological Survey (USGS) -40 (Robertson et al. 1974) (see Figure 2-3). Since then, perched water has been encountered in this zone during the drilling of several INTEC facility wells.

Only four monitoring wells are completed in the deep perched water zone. Wells MON-P-001, MON-P-018, and USGS-50 are completed in the northern portion of the facility, and water has been encountered at approximately 85, 107.5, and 101 m (322, 407, and 383 ft) bgs, respectively. In the southern portion of the INTEC facility, only Well MON-P-017 is completed in the lower perched water zone in which water is encountered at a depth of approximately 96 m (364 ft) bgs.

Similar to the upper perched water zone, it is thought that the lower perched water zone is formed by decreased permeability associated with sedimentary interbed layers. It appears that the lower perched water has formed primarily on the DE7 interbed (see Figure 2-2). The top of this interbed occurs beneath the INTEC at depths ranging from 101 to 112.5 m (383 to 426 ft) bgs in the western portion of the INTEC facility. However, the DE6 interbed is also responsible for creating perched water, which is associated with Wells USGS-40 and USGS-43. The lower perched water zone is not continuous beneath the entire facility and may actually consist of several individual perched water bodies. Recharge to the southern perched water body is from service wastewater discharged to the percolation ponds. The source of recharge to the western portion of the northern perched water body is unknown, though the BLR and facility water leaks are likely contributors.

2.3 Snake River Plain Aquifer

This section explains the regional hydrogeology and the SRPA beneath INTEC.

2.3.1 Regional Hydrogeology

The SRPA is about 322 km (200 mi) long and 89 to 113 km (55 to 70 mi) wide. It extends from Ashton and the Big Bend Ridge on the northeast to Hagerman on the southwest and covers about 25,900 km^2 (10,000 mi^2). The aquifer consists of a series of basalt flows with interbedded sedimentary deposits and pyroclastic materials. The boundaries are formed by the contacts of the aquifer with less permeable rock at the margins of the plain (Mundorff et al. 1964). Robertson et al. (1974) estimated that as much as 2 billion acre-ft of water may be in storage in the aquifer, of which about 500 million acre-ft are recoverable.

Groundwater in the SRPA generally occurs under unconfined conditions, but locally may be quasi-artesian or artesian (Nace et al. 1959). The quasi-artesian or artesian conditions are caused by layers of dense, massive basalt or sediments with relatively low permeability. Nace et al. (1959) described quasi-artesian as the situation in which the groundwater level is first recognized in a borehole during drilling at a depth below the regional water table, and then the level rises significantly (1.5 to 15.2 m [5 to 50 ft]) to the level of the water table. This rise of the water level simulates artesian pressure, but the conditions are not truly artesian. Nace et al. (1959) also noted water levels in some wells in the SRPA respond to fluctuations in barometric pressure similar to wells in confined aquifers, indicating that tight zones in the basalt may impede pressure equalization. True artesian or flowing artesian conditions in the SRPA were identified at Rupert, in parts of the Mud Lake Basin, and north of the American Falls Reservoir (Nace et al. 1959).

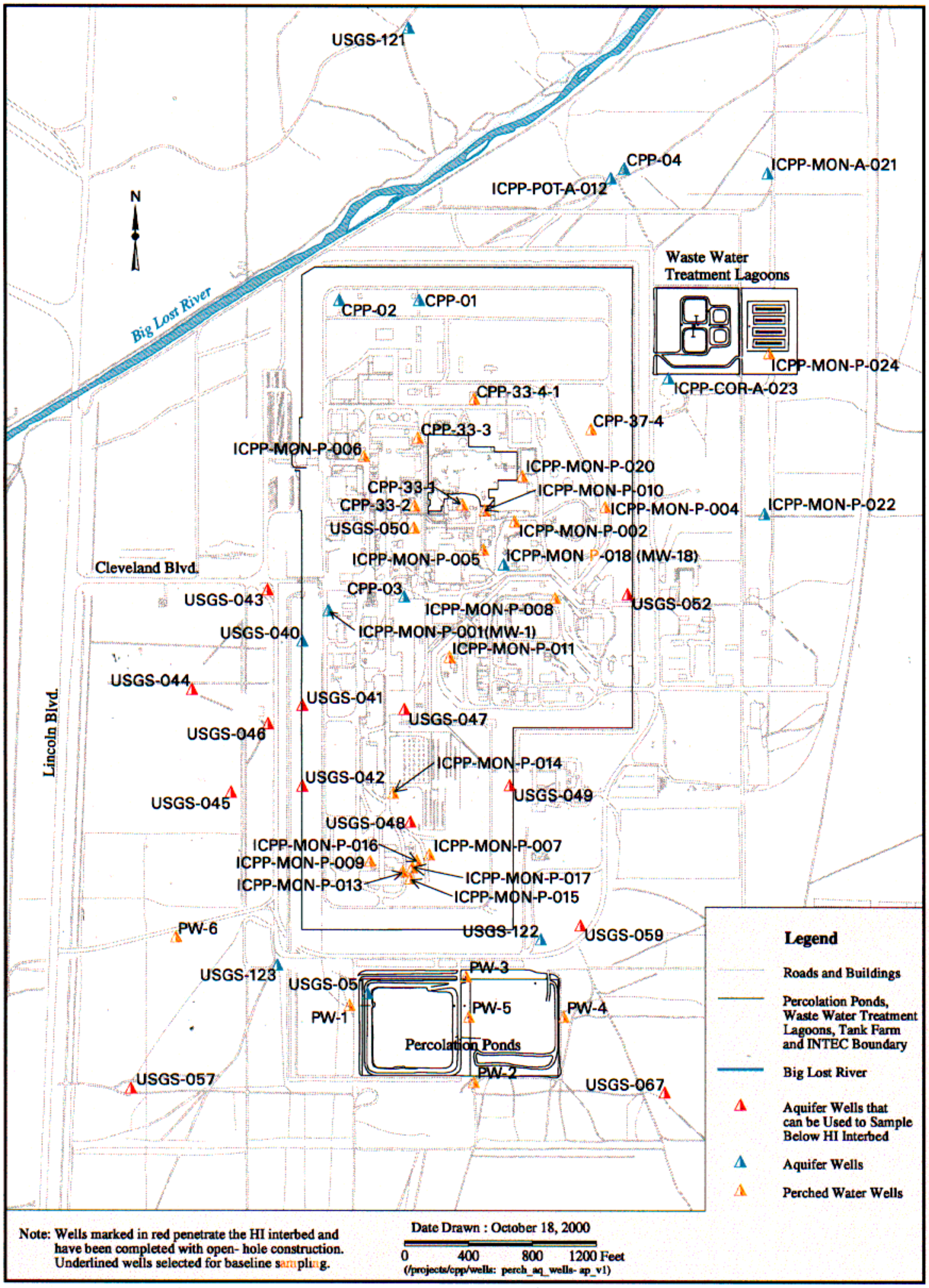


Figure 2-3. Locations of wells completed in the perched and groundwater zones.

Recharge to the aquifer is primarily by valley underflow from the mountains to the north and northeast of the plain and from infiltration of irrigation water. A small amount of recharge occurs directly from precipitation. Recharge to the aquifer within INEEL boundaries is primarily by underflow from the northeastern part of the plain and the BLR (Bennett 1990). Significant amounts of recharge from the BLR have caused water levels in some wells at the INEEL to rise as much as 1.8 m (6 ft) within in a few months after high flows in the river (Barraclough et al. 1982). Locally, the direction of groundwater flow is temporarily changed by recharge from the BLR (Bennett 1990).

Estimates of the effective thickness of the SRPA at the INEEL vary. A 3,159-m (10,365-ft) deep geothermal test well (INEL-1) was drilled about 7.2-km (4.5-mi) north of the INTEC in 1979. Subsurface geologic information from INEL-1 indicates at least 610 m (2,000 ft) of basalt underlie the INEEL (Prestwich and Bowman 1980). Hydrological data from INEL-1 were interpreted by Mann (1986) to indicate the effective base of the aquifer is 259 to 372 m (850 to 1,220 ft) bgs. The depth to water at INEL-1 is about 122 m (400 ft) bgs, which suggests an effective aquifer thickness of 137 to 250 m (450 to 820 ft). In earlier studies by Robertson et al. (1974), the effective portion of the SRPA at the Test Reactor Area (TRA) was assumed to be the upper 76 m (250 ft) of the saturated zone based on lithology and water quality. The aquifer thickness varies at different areas, and the aquifer becomes less productive with depth due to decreasing hydraulic conductivity (Hull 1989). Hydraulic conductivity of the basalt in the upper 244 m (800 ft) of the aquifer generally is 0.3 to 30.5 m/day (1 to 100 ft/day); whereas, the hydraulic conductivity of underlying rocks is several orders of magnitude smaller (Orr and Cecil 1991). Fracture filling from sediments and secondary mineralization is the principal reason for the decreased hydraulic conductivity.

Water level elevations generally range from 1,399 m (4,590 ft) above median sea level in the northern part of the INEEL to about 1,347 m (4,420 ft) above median sea level south of the INEEL with the depth to the water table varying from about 61.0 m (200 ft) bgs in the northern part of the INEEL to about 274 m (900 ft) bgs in the southern part. The general direction of groundwater flow is to the south-southwest, and the average gradient is about 0.8 m/km (4 ft/mi) (Orr and Cecil 1991). Locally, however, the hydraulic gradient varies significantly and ranges from about 0.2 m/km (1 ft/mi) in the northern part of the INEEL to a maximum of 2.8 m/km (15 ft/mi). The elevation of the water table and direction of groundwater flow are affected by recharge, groundwater withdrawal, and variations in aquifer transmissivity. The effects of groundwater withdrawal are often localized in contrast to recharge and transmissivity variations that have regional impacts. From July 1985 to July 1988, Orr and Cecil (1991) reported water level changes in INEEL wells ranging from a 7.9-m (26-ft) decline near the Radioactive Waste Management Complex to a 1.2-m (4-ft) rise north of Test Area North. Water levels generally declined in the southern two-thirds of the INEEL during that time and rose in the northern one-third.

Hydraulic properties of the SRPA have been determined by pumping tests. Robertson et al. (1974) reported transmissivities ranging from 1.24×10^4 to 1.24×10^6 m^2/day (1.34×10^5 to 1.3×10^7 ft^2/day) with 6.2×10^4 m^2/day (6.7×10^5 ft^2/day) considered normal. By calculating the geometric mean of transmissivity values, Hull (1989) estimated regional aquifer transmissivity for the southern INEEL to be 27,000 m^2/day (294,000 ft^2/day). Estimates of the storage coefficients range from 0.01 to 0.06 and effective porosity from 5 to 15%, with 10% being historically the most accepted value (Robertson et al. 1974), though more recent information indicates that a lower value may be appropriate.

2.3.2 INTEC Hydrogeology

Sixty-eight wells have been installed at the INTEC to monitor perched water bodies and the SRPA. This monitoring well network consists of 32 wells completed in the perched water zones and 36 wells completed in the SRPA. Several of the perched water monitoring wells are completed in multiple water bearing zones. The locations of wells completed in the perched and groundwater zones are shown in Figure 2-3, with the construction specifications provided in Appendix A.

Water level elevations indicate two separate sources of local recharge to the SRPA. One source for recharge is apparently from the percolation ponds as indicated by elevated water levels measured in Wells USGS-51, -112, -113, -114, -115, and -116. Water level response to recharge from these ponds is indicated by a 0.6 m (2 ft) rise in Well USGS-113 and a 0.3 m (1 ft) rise in Well USGS-51. The water table in the SRPA downgradient from the percolation ponds has a bimodal shape, indicating a preferred flow direction toward the southwest with a secondary flow component to the southeast.

Directly south of the ponds, water levels in Wells USGS-77 and USGS-111 are significantly lower than what would be expected based on the water levels in the adjacent wells. The reason(s) for the anomalously low water levels in these two wells is attributed to local variations in the water-bearing characteristics of the SRPA (see Section 2 of the remedial investigation/baseline risk assessment (RI/BRA) report [DOE-ID 1997a]). A second possible source of recharge to the SRPA may be indicated by anomalously high water levels measured in Well USGS-47. The water levels measured in Well USGS-47 are consistently 0.3 to 0.6 m (1 to 2 ft) higher than corresponding water levels measured from the surrounding wells. The possible causes of the anomalously high water levels include local recharge, local pumping, vertical hydraulic gradient (i.e., increasing hydraulic head with depth), and well completion characteristics.

The local groundwater flow appears complex and is apparently affected by local recharge, variations in hydraulic conductivity, local pumping, and possibly vertical hydraulic gradients. Groundwater directly beneath INTEC generally flows to the southwest and southeast, with a minor flow component to the south. The local flow pattern likely results from local recharge (i.e., percolation ponds and sewage ponds) that creates the mounding in the water table, and possibly from pumping the production wells. As the groundwater progresses beyond the influence of INTEC, it flows toward the southwest. The local hydraulic gradient is low, only 0.2 m/km (1.2 ft/mi) compared to the regional gradient of 0.8 m/km (4 ft/mi).

2.3.2.1 Local Flow Velocity. Tritium from INTEC wastes has been used extensively in tracing groundwater flow velocities and directions (Morris et al. 1964; Hawkins and Schmalz 1965; and Barraclough et al. 1967). Peaks of high tritium discharge to the disposal well have been particularly useful in determining the local flow characteristics in the SRPA. One of the most studied peak discharges of tritium occurred in December 1961 because it was preceded and followed by relatively long periods of low tritium discharge.

The concentration of the tritium peak as it passed each observation well provides an indication of the amount of dispersion the slug has undergone. The tritium concentration distribution indicates two preferred flow paths from the disposal well probably exist: (1) the predominant path to the southwest and (2) a less clearly defined path to the southeast. Some of the explanation for this phenomenon is provided in the plot of the transmissivity values for INTEC where a zone of low transmissivity is located directly to the south. This zone of low transmissivity to the south apparently acts as a barrier to impede the local groundwater flow.

2.3.2.2 Groundwater Pumping Effects. The INTEC facility uses approximately 7.9 million L (2.1 million gal) of water per day. This water is supplied by two raw water wells (CPP-1 and CPP-2) and two potable water wells (CPP-4 and new well) located in the northern portion of the facility. As part of the WAG 3 remedial investigation, the effect of pumping groundwater from these wells upon the local water table was investigated during July and August 1995. This investigation involved continuous water level monitoring of several aquifer wells completed in the northern section of INTEC while metering the pump usage in Production Well CPP-2.

Water level fluctuations in six aquifer wells (MW-18, USGS-40, -43, -47, -52, and -121) were monitored at 5-minute intervals using pressure transducers and data loggers. The National Oceanic and

Atmospheric Administration recorded barometric pressure changes at 5-minute intervals at the Central Facilities Area weather station, which is located approximately 5 km (3 mi) from the test site. Pump usage for Well CPP-2 was continuously monitored based on amperage requirements. During the 11 days of the test, the production well pump turned on 17 times with each pump cycle lasting for approximately 9 hours.

The water levels in all aquifer wells exhibited a similar response. Daily fluctuations, generally less than 3 cm (1 in.), were observed in all aquifer wells corresponding with pump usage of the production well. In almost all pump cycles, the corresponding water levels in the aquifer wells decreased by an average of 1.9 cm (0.75 in.). Only Pump Cycle #11 demonstrated an increase in water levels throughout the pump duration for all wells except Well USGS-40. This water level increase during this pump cycle may be the result of a local or regional trend and not related to pumping groundwater. Other than Pump Cycle #11, the water levels decreased during the pump cycle in Wells MW-18, USGS-40, -43, and -52 throughout the test.

As shown by this test, water levels in the SRPA are affected by pumping groundwater from the production well. Minimal responses (<2.5 cm [<1 in.]) were observed in these six monitoring wells; however, the wells are located approximately 610 m (2,000 ft) from the production well. Increased drawdown would be expected closer to the production well that could affect the local groundwater flow direction in the northern sections of INTEC.

2.3.2.3 Hydraulic Conductivity. The hydraulic conductivity of the SRPA in the vicinity of INTEC was estimated using the transmissivity values reported by Ackerman (1991) and the saturated thickness of the open interval of the well (Table 2-1). The estimation of hydraulic conductivity assumes the wells fully penetrate the saturated thickness of the aquifer. Hydraulic conductivities range five orders of magnitude with a maximum hydraulic conductivity of 3.0×10^3 m/day (1.0×10^4 ft/day) at Well CPP-3 and a minimum hydraulic conductivity of 3.0×10^{-2} m/day (1.0×10^{-1} ft/day) at Well USGS-114. The average hydraulic conductivity within the immediate vicinity of INTEC is $4.0 \times 10^2 \pm 7.9 \times 10^2$ m/day ($1.3 \times 10^3 \pm 2.6 \times 10^3$ ft/day). Using the average hydraulic conductivity, a hydraulic gradient of 1.2 m/km (6.3 ft/mi) (Orr and Cecil 1991), and an effective porosity of 10%, the calculated seepage velocity in the vicinity of the INTEC is approximately 3 m/day (10 ft/day).

2.4 Contaminants of Concern

The water quality in the SRPA at and downgradient from INTEC has been adversely impacted due to past facility operations. The SRPA (Group 5) is identified as containing low-level threat wastes. The COCs identified in the OU 3-13 baseline risk assessment are primarily radionuclides and include Sr-90, tritium, Cs-137, I-129, plutonium isotopes (Pu-238, -239, -240, and -241), uranium isotopes (U-234, -235, and -238), Np-237, Am-241, and Tc-99. In addition, mercury was identified as a COC.

It has been estimated a total of 22,000 Ci of radioactive contaminants have been released in 4.2×10^{10} L (1.1×10^{10} gal) of water (DOE-ID 1997a). The vast majority of this radioactivity is attributed to tritium (approximately 96%) with minor components of Am-241, Tc-99, Sr-90, Cs-137, Co-60, I-129, and plutonium. In May and June 1995, groundwater samples were collected from the aquifer wells located near and downgradient from the INTEC. The results from this sampling effort are provided in Table 2-2.

Table 2-1. Transmissivities in the SRPA near the INTEC (Ackerman 1991) and estimates of hydraulic conductivity.

Well Identifier	Transmissivity (ft^2/day)	Saturated Thickness [a] (ft)	Hydraulic Conductivity (ft/day)
CPP-1	7.3×10^4	150	4.9×10^2
CPP-2	1.6×10^5	75	2.1×10^3
CPP-3	7.6×10^5	74	1.0×10^4
CPP-4	2.5×10^2	255	9.8×10^{-1}
USGS-37	1.6×10^4	65	2.5×10^2
USGS-40	8.7×10^4	27	3.2×10^3
USGS-43	8.0×10^4	225	3.6×10^2
USGS-51	2.9×10^3	184	1.6×10^1
USGS-57	2.8×10^4	255	1.1×10^2
USGS-82	5.6×10^4	100	5.6×10^2
USGS-111	2.2×10^1	137	1.6×10^{-1}
USGS-112	6.4×10^4	96	6.7×10^2
USGS-113	1.9×10^5	97	2.0×10^3
USGS-114	1.0×10^1	100	1.0×10^{-1}
USGS-115	3.2×10^1	123	2.6×10^{-1}
USGS-116	1.5×10^2	127	1.2×10^0
Maximum	7.6×10^5		1.0×10^4
Minimum	1.0×10^1		1.0×10^{-1}
Average ± standard deviation	9.5×10^4 $\pm 1.9 \times 10^5$		1.3×10^3 $\pm 2.6 \times 10^3$

a. Saturated thickness values are the total saturated portion of the open well interval.

Table 2-2. Summary sampling results statistics for contaminants in the SRPA Wells (May-June 1995).[a]

Contaminants	Water Concentration, mg/L or pCi/L			Number of Samples	Number of Detects	Frequency of Detection
	Minimum	Maximum	PRG[b]			
Ag	6.30E-04 BNJ	8.80E-04 BNJ	1E-01[c]	38	3	8%
As	3.10E-03 B	1.08E-02 B	5E-02	42	3	7%
Ba	5.00E-02 B	2.05E-01	2E+00	42	42	100%
Cd	4.80E-04 B	3.00E-03 B	5E-03	42	4	10%
Co	5.20E-04 B	1.40E-03 B	NA	42	8	19%
Cr	1.80E-03 B	3.88E-02	1E-01	42	31	74%
Cu	1.60E-03 BJ	3.20E-03 B	1.3E+00	42	7	17%
Hg	1.00E-04 B	4.40E-04	2E-03	42	7	17%
Mn	8.40E-04 B	6.28E-02	5E-02[c]	42	10	24%
Ni	4.30E-03 B	2.06E-01	NA	42	6	14%
Pb	2.30E-03 BWJ	3.77E-02	1.5E-02	42	10	24%
Sb	1.90E-03 B	4.60E-03 B	6E-03	42	3	7%
Se	1.40E-03 B	3.70E-03 B	5E-02	42	7	17%
V	2.30E-03 B	9.90E-03 B	NA	42	24	57%
Zn	2.60E-03 B	4.54E-01 IJ	5E+00[c]	42	27	64%
Am-241	5.40E-01	5.40E-01	<1.5E+01[d]	49	1	2%
I-129[e]	9E-07	3.82E+00	1E+00[d]	33	32	94%
Sr-90	7.00E-01	8.40E+01	8E+00	70	49	70%
Tc-99	1.10E+00	4.48E+02	9E+02[d]	70	57	81%
Tritium	5.81E+02	3.07E+04	2E+04	49	45	92%
U-234	7.00E-01	2.60E+00	1.5E+01[f]	49	7	14%

Table 2-2. (continued).

	Water Concentration, mg/L or pCi/L					
Contaminants	Minimum	Maximum	PRG[b]	Number of Samples	Number of Detects	Frequency of Detection
U-238	8.00E-01	1.10E+00	1.5E+01[f]	49	4	8%
Gross alpha	2.30E+00	1.00E+01	1.5E+01[g]	49	20	41%
Gross beta	2.40E+00	4.69E+02	4mrem/yr[h]	49	49	100%

a. NOTE: Duplicate and QC sample results were not included in the statistical analysis. Analytical results are from groundwater samples collected from the SRPA during May and June 1995 as part of the OU 3-13 RI. Results are provided in Table 4-4 of the OU 3-13 RI/FS Part A (DOE-ID 1997a) and the ERIS Database. Samples were analyzed for TAL inorganics and radionuclides. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Ca, Fe, Mg, K, and Na. Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The PRG concentrations are from the Primary Constituent Standards table in IDAPA 58.01.11.200(a) unless otherwise footnoted.

c. The PRG concentrations for manganese, silver, and zinc are from the Secondary Constituent Standards in IDAPA 58.01.11.200(b).

d. The PRG concentrations for Am-241, I-129, were Tc-99 are calculated values based on the National Interim Primary Drinking Water Regulations (EPA 1976).

e. Summary sampling data for I-129 was taken from data collected during the 1990-91 USGS sampling event (DOE-ID 1994). The data shown in the table are only from those wells sampled both during the 1990-91 USGS sampling event and the WAG 3 RI/FS, May–June 1995, sampling event.

f. The PRG concentrations for U-234 and U-238 are from Section 8, Table 8-2 of the ROD (DOE-ID 1999).

g. The PRG concentration for gross alpha includes radium-226 but excludes radon and uranium.

h. The PRG concentration for gross beta (combined beta/photon emitters) is 4 mrem/yr effective dose equivalent.

3. GROUNDWATER SAMPLING AND MONITORING DATA QUALITY OBJECTIVES

The objective of this LTMP is to outline the sample collection and monitoring activities to be conducted to monitor the contaminants in the SRPA outside the INTEC fence and to monitor the flux of contaminants in the aquifer across the INTEC security fence. The groundwater monitoring will be performed to meet the SRPA monitoring requirements as stated in the OU 3-13 ROD (DOE-ID 1999). In general, the results from the monitoring will be used to

- Monitor the flux of contaminants in the aquifer across the INTEC security fence in the Group 5
- Validate and/or update the OU 3-13 aquifer numerical model
- Evaluate whether the INTEC groundwater plume in the SRPA outside of the INTEC fence line will meet the Group 5 remedial action objective (RAO) of achieving Idaho groundwater quality standards or risk-based concentrations in the SRPA by 2095.

3.1 Data Quality Objectives

To help with defensible decision-making, the EPA has developed the DQO process, which is a systematic planning tool based on the scientific method for establishing criteria for data quality and for developing data collection designs (EPA 1994). DQOs have been developed to guide monitoring and sampling of the SRPA. The process consists of seven iterative steps that yield a set of principal study questions (PSQs) and decision statements (DSs) that must be answered to address a primary problem statement. The seven steps comprising the DQO process are listed below:

Step 1: State the problem

Step 2: Identify the decision

Step 3: Identify the inputs to the decision

Step 4: Define the study boundaries

Step 5: Develop decision rules

Step 6: Specify limits on the decision

Step 7: Optimize the design for obtaining data.

The DQOs that govern the Group 5 groundwater sampling and monitoring are presented in the following sections and summarized in Table 3-1. These objectives were negotiated with and have the concurrence of the Agencies.

3.1.1 State the Problem

The WAG 3 ROD requires monitoring activities to determine whether present contaminants in Group 5 or the flux of contaminants originating from within the INTEC security fence will affect the aquifer such that Idaho groundwater quality standards or risk-based concentrations will not be met in Group 5 in 2095.

tify the Decision		3: Identify Inputs to the Decision	4: Define the Study Boundaries
ve Actions: ative actions required for g program.	**Decision Statement:** DS-1: Determine whether or not the flux of contaminants in the SRPA which originate in the vadose zone within the INTEC security fence line is of sufficient magnitude to exceed the Group 5 remediation goals in 2095.	The inputs to PSQ-1 are Sampling of selected wells upgradient of, near the boundary of, and within the INTEC security fence line and analysis for COCs. Selected wells will be sampled in the upper 50 ft of the SRPA. Measurement of water table elevations for evaluation of groundwater elevation contours and flow direction. Periodic incorporation of new data and update of the OU 3-13 aquifer numerical model for prediction of COC concentrations in the SRPA at 2095 and beyond	This study will focus on the SRPA beneath the INTEC facility and near the boundary of the facility. The area of focus along the INTEC boundary is the south and west boundaries given the south-southwest direction of groundwater flow in this region. The primary sources of contaminants to the aquifer include both the perched water/vadose zone above SRPA and the former injection well which penetrates the aquifer and HI interbed. Two principal study questions have been identified to evaluate these sources separately.
ative actions required for g program.	DS-2: Determine whether or not the flux of contaminants in the SRPA from the former INTEC injection well is of sufficient magnitude to exceed the Group 5 remediation goals in 2095.	The inputs to PSQ-2 are Borehole geophysical and fluid logging of selected wells which penetrate the HI interbed for selection of wells and sampling zones below the HI interbed downgradient of the former injection well. Isolation through packers or other method(s), sampling, and analysis for COCs of selected well zones below the HI interbed downgradient of the former injection well. Measurement of water table elevations for evaluation of groundwater elevation contours and flow direction, and possibly head gradient between aquifer above and below the HI interbed. Periodic incorporation of new data and update of the OU 3-13 aquifer numerical model for prediction of COC concentrations in the SRPA at 2095 and beyond. NOTE: Isolation of sampling zone(s) beneath the HI interbed depth from selected wells should also not preclude sampling of zone(s) above the HI interbed from the same well to supply inputs for PSQ-1.	The portion of the aquifer that is likely to be affected by contaminants transported through the vadose zone is the upper 50 ft of the aquifer above the HI interbed. Because the former injection well penetrated the HI interbed, the portion of the aquifer potentially affected by the injection well includes both the upper zone from the water table to the HI interbed and the lower zone beneath the HI interbed. The total depth of the former injection well was 598 ft. Accordingly, the base of the study boundary should correspond to the total depth of injection, or approximately 600 ft below land surface.
ative actions required for g program.	DS-3: Determine whether or not the COCs in the SRPA outside the INTEC facility will exceed the Group 5 remediation goals in 2095.	The inputs to PSQ-3 are Sampling of selected wells downgradient of the INTEC security fence and analysis for COCs. Selected wells will monitor the contaminants above the MCLs and monitor the downgradient plume area above the MCLs. Measurement of water elevations for evaluation of groundwater elevation contours and flow direction. Periodic incorporation of new data into the OU 3-13 aquifer numerical model for the prediction of COC concentrations in the SRPA in 2095 and beyond.	Monitoring the concentrations of COCs above and below the HI interbed and as far downgradient as indicated by the detections of COCs above MCLs. Because the remediation goal is established in the year 2095, this study will continue through the institutional control period to at least 2095.

ow chart presenting the conceptual design of the WAG 3 Group 5 field activities entitled "Logic diagram for Group 5 field activities," is shown in Section 1, Figure 1-1. The flow chart details the steps e taken to both arrive at a contingent remedy decision and to perform the SRPA interim monitoring. The two separate flow paths are identified on the chart. The following paragraphs describe and ent the rationale for the design of field activities related to the contingent remedy decision.

ty six wells are available in the vicinity of INTEC suitable for groundwater monitoring. From that set of wells, eleven are selected for the INTEC facility monitoring program to support PSQ-1, itoring of the contaminant input from the vadose zone to the SRPA. The PSQ-1 INTEC facility monitoring shall consist of groundwater sample collection from wells located upgradient of, within, and cent to the INTEC facility. The wells selected for monitoring include MW-18, USGS 40, USGS 42, USGS 47 through 49, USGS 51, USGS 52, and USGS 122 through USGS 123 and the tank farm set aquifer well ICPP-MON-A-230 (see Section 4, Figure 4-1). One well, USGS 121, was selected upgradient of the contaminant source areas at INTEC to provide background groundwater quality Though this well is not directly upgradient of the INTEC facility, it is located nearer to the groundwater flow paths from potential sources of upgradient contamination (TRA or NRF) than other wells s, in that respect, well suited for providing upgradient water quality data. Several wells were selected inside the INTEC facility (MW-18, USGS 47, USGS 48, USGS 49, and USGS 52) to help nguish between the possible sources of groundwater contaminants located throughout the INTEC facility. Wells USGS 40, USGS 42, USGS 51, USGS 122, and USGS 123 were selected because they ocated along the southern and western boundaries of INTEC. The general direction of groundwater flow beneath INTEC is interpreted to be to the south-southwest. The selected wells considered uate for the INTEC facility monitoring and no new wells are considered necessary at this time. However, additional wells are currently planned for various other monitoring programs at INTEC. As e wells become available, they will be considered for inclusion into the INTEC facility monitoring program.

three wells selected for monitoring in support of PSQ-2, former injection well monitoring, are USGS-41, USGS-48, and USGS-59 based upon an evaluation of their suitability for monitoring the fer below the HI interbed. There are 12 USGS wells in the vicinity of INTEC and the former injection well that penetrate the HI interbed and remain as open boreholes in the aquifer, potentially ble for long term monitoring of the aquifer beneath the HI interbed (excluding INTEC production wells which are required for facility support and cannot be modified to sample below the HI bed). The wells are USGS-40 through 49, USGS 51, USGS 52, and USGS 59. These wells are located either cross-gradient or downgradient of the former injection well. An evaluation of available from and additional geophysical and borehole fluid logging of these wells will be performed to determine if they are suitable for deep sampling and to identify potential zones for sampling. It should oted that an upgradient monitoring well which penetrates the HI interbed is not available within the existing monitoring well network at INTEC. Well USGS-121 does not penetrate the HI interbed. uction wells CPP-1, CPP-2, and CPP-4 have been drilled through the HI interbed and have perforated well casing both above and below the HI interbed but are of limited use as monitoring wells d upon their required support of INTEC operations. The need for an upgradient monitoring well in this zone will be evaluated after the monitoring program is initiated. If the data obtained from the ity monitoring program indicate that the injection well secondary source may cause or contribute to not meeting the Group 5 RAO/ remediation goals, an upgradient well will be installed for sampling ath the HI interbed to ensure that an upgradient source is not present. It should also be noted that current plans for OU 3-14 investigation include the installation of monitoring well in the immediate ity of the former injection well. As these well(s) become available, they will be incorporated into the INTEC facility monitoring well program to provide additional data in the vicinity of the injection secondary source.

dition to the above monitoring, one sampling round will be conducted using the entire INTEC monitoring network at the onset of the activities outlined in the LTMP. This sampling event will provide apshot" of the current state of the contamination of the SRPA in the vicinity of the INTEC facility and provide a data set to compare the COC flux monitoring data. In addition, these data will be used date the OU 3-13 numerical aquifer model. In support of Group 4 activities, groundwater samples collected during the baseline sampling event from USGS-40, -42, -47, -48, -51, -52, -121, -122, , and MW-18 will be analyzed for stable isotopes including oxygen, hydrogen, and nitrogen. In addition to the analytes listed below, metals and anions will be included in the semiannual sampling ucted after the baseline sampling.

wells have been selected for long-term monitoring of the INTEC plume beyond the facility boundary in support of PSQ-3. The wells selected for long-term monitoring are USGS-57, USGS-67, S-112, USGS-85, LF2-08, and LF3-08. These wells were selected based on a review of the historical data for I-129. However, most of the data used to select these wells for long-term monitoring are 1990–1991; therefore, the baseline groundwater sampling data will be used to optimize the well locations and the total number of wells for long-term monitoring.

ytes of interest include COCs which currently exist in the SRPA at concentrations exceeding either MCLs or risk based concentrations as well as COCs derived from the modeling which are predicted tentially cause a future unacceptable risk to the SRPA. Contaminants that currently exceed MCLs or risk based concentrations and will be included in the INTEC facility monitoring program are 9, H-3, and Sr-90. Contaminants that are predicted by the WAG 3 RI/FS modeling to exceed MCLs or risk based concentrations at a future date and are included in the INTEC facility monitoring ram are plutonium and uranium isotopes, Np-237, Am-241, and mercury. Chromium, while listed as a COC, is excluded because it is specifically related to groundwater contamination at TRA. Also, use Tc-99 is a contributor to total beta emitting radionuclides limit and present at significant concentrations in the aquifer beneath INTEC, it is included in the list of analytes for INTEC facility itoring. To evaluate additional radionuclides that may be present but not accounted for in the modeling, gross-alpha and gross-beta analyses will also be performed. Finally, the list of analytes will be ted through either the exclusion of some analytes or inclusion of additional analytes as analytical data is accumulated or new information regarding contaminant sources is identified. The detection s for I-129, Sr-90, and tritium required to make the decisions needed concerning the contingent remedy are 0.1 pCi/L, 0.8 pCi/L and 2000 pCi/L, respectively.

pling and analyses will occur at the following frequency:

Year 1	Semi-annual (twice per year)	Gross-alpha/beta, Hg, tritium, Tc-99, I-129, Sr-90, plutonium isotopes (Pu-238, -239, -240, and -241), uranium isotopes (U-234, -235, and -238), Am-241, Nd-237, Cs-137
Years 2–7	Annual	Gross-alpha/beta, Hg, tritium, Tc-99, I-129, Sr-90, plutonium isotopes (Pu-238, -239, -240, and -241), uranium isotopes (U-234, -235, and -238), Am-241, Nd-237, Cs-137

The possibility of COC flux in the SRPA originating from sources within INTEC, either in the vadose zone or in the vicinity of the former INTEC injection well, must be quantified. The concentration of contaminants downgradient of INTEC also needs to be monitored. These data can be used to update and refine the OU 3-13 numerical groundwater model to better predict the state of the aquifer in 2095.

3.1.2 Identify the Decision

This step of the DQO process lays out the principal study questions, alternative actions, and corresponding decision statements that must be answered to effectively address the problem stated above. The remediation goal for OU 3-13, Group 5 is "Achieving the applicable State of Idaho groundwater standards or risk-based groundwater concentrations in the SRPA plume south of the INTEC security fence by the year 2095" (ROD, Sec. 8.1.5, p 8-10). To determine if this goal will be met, the input of contaminants to Group 5 from the contaminated aquifer within the INTEC security fence and the distribution of contaminants in the aquifer outside the INTEC security fence must be determined. To further assist in this evaluation, the groundwater modeling conducted as part of the OU 3-13 RI/FS will be utilized and refined with data collected under this LTMP.

3.1.2.1 Principal Study Questions. The purpose of the PSQ is to identify key unknown conditions or unresolved issues that, when answered, provide a solution to the problem being investigated. The PSQs for this project are

PSQ-1: Is the COC flux in the SRPA from the contaminated media in the vadose zone within the INTEC security fence of sufficient magnitude to prevent achieving the Group 5 remediation goals?

PSQ-2: Is the COC flux in the SRPA from the contaminated sediments/sludges remaining in the former ICPP injection well (CPP-3) and immediate vicinity of sufficient magnitude to prevent achieving the Group 5 remediation goals?

PSQ-3: Are the COC concentrations in the SRPA outside the INTEC facility of sufficient magnitude to prevent achieving the Group 5 remediation goals?

3.1.2.2 Alternative Actions. Alternative actions are those actions resulting from resolution of the above PSQs. The types of actions considered will depend on the answers to the PSQs.

3.1.2.3 Decision Statements. The DSs combine the PSQs and alternative actions into a concise statement of action. The DSs are

DS-1: Determine whether the flux of contaminants in the SRPA that originate in the vadose zone within the INTEC security fence is of sufficient magnitude to exceed the Group 5 remediation goals in 2095.

DS-2: Determine whether the flux of contaminants in the SRPA from the former INTEC injection well is of sufficient magnitude to exceed the Group 5 remediation goals in 2095.

DS-3: Determine whether the COCs in the SRPA outside the INTEC facility will exceed the Group 5 remediation goals in 2095.

It is important to realize that the installation of an updated monitoring system and collection of new types of data during the SRPA monitoring might modify the site conceptual model for vadose zone flow and transport beneath WAG 3. If the conceptual model is significantly changed, DS-1 and DS-2 may need to be reevaluated accordingly.

3.1.3 Identify Inputs to the Decision

This step of the DQO process identifies the informational inputs that are required to answer the DSs made above.

3.1.3.1 Inputs for PSQ-1. PSQ-1 will be answered by collecting data on the COC flux originating in the vadose zone within the INTEC security fence, updating the OU 3-13 aquifer numerical model, and evaluating the predictions of the updated aquifer numerical model for COC concentrations in 2095.

Inputs to PSQ-1 are

1. Samples of selected wells upgradient of, near the boundary of, and within the INTEC security fence line, and analysis for COCs. Selected wells will penetrate the upper 15 m (50 ft) of the SRPA.

2. Measurements of water table elevations for evaluation of groundwater elevation contours and flow direction.

3. Periodic incorporation of new data and update of the OU 3-13 aquifer numerical model for prediction of COC concentrations in the SRPA at 2095 and beyond.

3.1.3.2 Inputs for PSQ-2. PSQ-2 will be answered by collecting measurements of COC flux originating from the former injection well within the INTEC security fence, updating the OU 3-13 aquifer numerical model, and evaluating the predictions of the updated aquifer numerical model for COC concentrations in 2095.

Inputs to PSQ-2 are

1. Borehole geophysical and fluid logging of selected wells which penetrate the HI interbed for selection of wells and sampling zones below the HI interbed downgradient of the former injection well

2. Isolation through packers or other method(s), sampling, and analysis for COCs of selected well zones below the HI interbed downgradient of the former injection well

3. Measurements of water table elevations to contour of groundwater elevations and to determine flow direction, and possibly head gradient between the aquifer above and below the HI interbed

4. Periodic incorporation of new data and update of the OU 3-13 aquifer numerical model for prediction of COC concentrations in the SRPA in 2095 and beyond.

Isolation of sampling zone(s) beneath the HI interbed depth from selected wells should not preclude the sampling of zone(s) above the HI interbed from the same well to supply inputs for PSQ-2.

3.1.3.3 Inputs for PSQ-3. PSQ-3 will be answered by collecting measurements of COCs in the aquifer beyond the INTEC security fence line and by updating the OU 3-13 aquifer numerical model. The inputs to PSQ-3 are

1. Sampling selected wells downgradient of the INTEC security fence and analysis for COCs. Selected wells will monitor the contaminants above MCLs and monitor the downgradient plume area above MCLs.

2. Measuring water elevations for evaluation of groundwater elevation contours and flow direction.

3. Periodic incorporation of new data into the OU 3-13 aquifer numerical model for the prediction of COC concentrations in the SRPA in 2095 and beyond.

3.1.4 Define the Boundaries of the Study

This study will focus on the SRPA beneath INTEC, near the boundary of the facility and downgradient of the facility. The area of focus is the south and west boundaries because of the south-southwest direction of groundwater flow in this region.

The primary sources of contaminants to the aquifer include both the perched water/vadose zone above SRPA and the former injection well that penetrates the aquifer and HI interbed. Two PSQs have been identified to evaluate these sources separately.

The portion of the aquifer that is likely to be affected by contaminants transported through the vadose zone is the upper 15 m (50 ft) of the aquifer above the HI interbed.

Because the former injection well penetrated the HI interbed, the portion of the aquifer potentially affected by the injection well includes both the upper zone from the water table to the HI interbed and the lower zone beneath the HI interbed. The total depth of the former injection well was 182 m (598 ft). Accordingly, the base of the study boundary should correspond to the total depth of injection, or approximately 600 ft bgs.

The third PSQ addresses monitoring the contaminants already present in Group 5 downgradient of INTEC. The long-term plume monitoring will monitor the concentrations of COCs as far downgradient of the INTEC facility as indicated by the detection of COCs above MCLs.

Because the remediation goal is established in the year 2095, this study will continue through the institutional control period to at least 2095.

3.1.5 Develop a Decision Rule

This step of the DQO process brings together the outputs from Steps 1 through 4 into a single statement describing the basis for choosing among the listed alternatives. If the monitoring activities and model predictions generated for this study indicate that Group 5 RAOs/remediation goals (RGs) will be exceeded due to the flux of contaminants in the SRPA beneath INTEC, then a comprehensive evaluation, focused feasibility study and ROD amendment will be prepared to address the risks posed by groundwater contaminants beneath INTEC. If it is determined that the RAOs/RGs will be met, monitoring will continue until 2095, or until the Agencies determine that no unacceptable risk exists from Group 5.

The decision is based upon model predictions using data obtained from an observational well network to model evolution of the plume.

3.1.6 Specify Tolerable Limits on Decision Errors

This step of the DQO process specifies acceptable limits on decision error. These limits are used to establish performance goals for the data collection design. In this case, the decisions will be made by evaluating computer predictions, and thus, the accuracy of the computer predictions will bound the tolerable limits on the decision errors.

3.1.7 Optimize the Design

A flow chart presenting the conceptual design of the Group 5 field activities is provided in Section 1, Figure 1-1. The flow chart details the steps to be taken to both arrive at a contingent remedy decision and to perform the SRPA interim monitoring. The two separate flow paths are identified on the chart. The following paragraphs describe and present the rationale for the design of field activities related to the contingent remedy decision.

There are thirty-six wells that are available in the vicinity of INTEC suitable for groundwater monitoring. From that set of wells, 12 are selected for the INTEC facility-monitoring program to support PSQ-1, monitoring of the contaminant input from the vadose zone to the SRPA. The PSQ-1 INTEC facility monitoring will consist of groundwater sample collection from wells located upgradient of, within, and adjacent to INTEC. The wells selected for monitoring include MW-18, USGS-40, USGS-42, USGS-47 through USGS-49, USGS-51, USGS-52, and USGS-122 through USGS-123 and ICPP-MON-A-230 (see Section 2, Figure 2-3). One well, USGS-121, was selected upgradient of the contaminant source areas at INTEC to provide background groundwater quality data. Though this well is not directly upgradient of the INTEC facility, it is located nearer to the groundwater flow paths from potential sources of upgradient contamination (TRA or Naval Reactors Facility) than other wells and is, in that respect, well suited for providing upgradient water quality data. Several wells were selected inside INTEC (ICPP-MON-A-230, MW-18, USGS-47, USGS-48, USGS-49, and USGS-52) to help distinguish between the possible sources of groundwater contaminants. Wells USGS-40, USGS-42, USGS-51, USGS-122, and USGS-123 were selected because they are located along the southern and western boundaries of INTEC. The general direction of groundwater flow beneath INTEC is interpreted to be to the south-southwest. The selected wells are considered adequate for the INTEC facility monitoring and no new wells are considered necessary at this time. However, additional wells are currently planned for various other monitoring programs at INTEC. As these wells become available, they will be considered for inclusion into the INTEC facility-monitoring program.

The three wells selected for monitoring in support of PSQ-2, former injection well monitoring, are USGS-41, USGS-48, and USGS-59, based upon an evaluation of their suitability for monitoring the aquifer below the HI interbed. There are 12 USGS wells in the vicinity of INTEC and the former injection well that penetrate the HI interbed and remain as open boreholes in the aquifer, potentially suitable for long term monitoring of the aquifer beneath the HI interbed (excluding INTEC production wells that are required for facility support and cannot be modified to sample below the HI interbed). The wells are USGS-40 through USGS-49, USGS-51, USGS-52, and USGS-59. These wells are located either cross-gradient or downgradient of the former injection well. An evaluation of available data from, and additional geophysical and borehole fluid logging of, these wells will be performed to determine if the selected wells are suitable for deep sampling and to identify potential zones for sampling. (NOTE: because these wells are completed with an open borehole, there is a significant possibility that the deeper portions of one or more of these may be obstructed, requiring the selection of an alternate well from the 12 wells identified above.) It should be noted that an upgradient monitoring well that penetrates the HI interbed is not available within the existing monitoring well network at INTEC. Well USGS-121 does not penetrate the HI interbed. Production wells CPP-1, CPP-2, and CPP-4 have been drilled through the HI interbed and have perforated well casing both above and below the HI interbed but are of limited use as monitoring wells based upon their required support of INTEC operations. The need for an upgradient monitoring well in this zone will be evaluated after the monitoring program is initiated. If the data obtained from the facility monitoring program indicate that the injection well may cause or contribute to not meeting the Group 5 RAO/RGs, an upgradient well will be installed for sampling beneath the HI interbed to ensure that there is no upgradient contaminant source present. Also, current plans for OU 3-14 investigation include the installation of a monitoring well in the immediate vicinity of the former injection well. As the additional well(s) become available, they will be incorporated into the INTEC facility monitoring well program to provide additional data in the vicinity of the injection well.

In addition to the above monitoring, one sampling round will be conducted using the entire INTEC monitoring network at the onset of the activities outlined in this LTMP. This baseline sampling event will provide information on the current state of the contamination of the SRPA in the vicinity of INTEC and provide a data set to compare the COC flux monitoring data. These data will be used to update the OU 3-13 numerical aquifer model. In support of Group 4 activities, groundwater samples collected during the baseline sampling event from USGS-40, -42, -47, -48, -51, -52, -121, -122, -123, and MW-18 will be analyzed for stable isotopes including oxygen, hydrogen, and nitrogen.

Six wells have been selected for long-term monitoring of the INTEC plume beyond the facility boundary in support of PSQ-3. The wells selected for long-term monitoring are USGS-57, USGS-67, USGS-112, USGS-85, LF2-08, and LF3-08. These wells were selected based on a review of the historical data for I-129. However, most of the data used to select these wells for long-term monitoring is from 1990–1991; therefore, the baseline groundwater sampling data will be used to optimize the well locations and the total number of wells for long-term monitoring.

Analytes of interest include COCs that currently exist in the SRPA at concentrations exceeding either MCLs or risk-based concentrations, as well as COCs derived from the modeling, which are predicted to potentially cause a future unacceptable risk to the SRPA. Contaminants that currently exceed MCLs or risk-based concentrations and will be included in the INTEC facility monitoring program are I-129, Sr-90, and tritium. Contaminants that are predicted by the WAG 3 RI/FS modeling to exceed MCLs or risk-based concentrations at a future date, and are included in the INTEC facility monitoring program, are plutonium and uranium isotopes, Np-237, Am-241, and mercury. Chromium, while listed as a COC, is excluded here because it is specifically related to groundwater contamination at TRA. Because Tc-99 is a contributor to the total beta-emitting radionuclide limit and is present at significant concentrations in the aquifer beneath INTEC, it is included in the list of analytes for INTEC facility monitoring. To evaluate additional radionuclides that may be present but not accounted for in the modeling, gross-alpha, and gross-beta analyses will also be performed. Finally, the list of analytes will be updated through either the exclusion of some analytes or inclusion of additional analytes as analytical data are accumulated or new information regarding contaminant sources is identified. The detection limits for I-129, Sr-90, and tritium required to make the decisions needed concerning the contingent remedy are 0.1 pCi/L, 0.8 pCi/L, and 2,000 pCi/L, respectively.

Sampling and analyses will occur at the following frequency:

Year 1	Baseline 47 wells semiannual 20 wells	Tritium, Tc-99, I-129, Sr-90, plutonium isotopes, uranium isotopes (U-234, -235, and -238), Am-241, Np-237, Cs-137, gross-alpha/beta, and mercury;
Years 2–7	Annual 20 wells	Tritium, Tc-99, I-129, Sr-90, plutonium isotopes, uranium isotopes (U-234, -235, and -238), Am-241, Np-237, Cs-137, gross-alpha/beta, and mercury
Years 8–16	Biannual	Review and adjust as required
Years 17–100	Once every 5 years	Review and adjust as required

Following each sampling event and prior to each CERCLA 5-year review, the new groundwater sampling results will be compared against the OU 3-13 aquifer model predictions to determine how concentrations compare to the model predicted trends. If the new data indicate the necessity, the model will be updated, generating new COC concentration predictions. These predictions will be compared against the Group 5 RAO/RGs to determine if they will be exceeded. If the data trends exceed model predicted trends and indicate a potential to exceed the Group 5 RAO/RGs, the sampling frequency will revert to annual sampling and progress in a manner similar to the schedule above.

3.1.8 DQO Summary

A summary of the DQOs is presented in Table 3-1.

3.2 Sampling Objectives

The purpose of the groundwater monitoring and sampling is to collect data to determine if the remediation goal for OU 3-13, Group 5 of "Achieving the applicable State of Idaho groundwater standards or risk-based groundwater concentrations in the SRPA plume south of the INTEC security fence by the year 2095" (ROD, Sec. 8.1.5, p 8-10) will be met. The monitoring and sampling will quantify the input of contaminants to Group 5 from the contaminated aquifer within the INTEC security fence.

In addition to investigating the Group 5 RAOs, a comprehensive round of groundwater samples will be collected from the INTEC monitoring well network to provide a "snapshot" of the present state of contamination within the SRPA in and around the INTEC facility. These data will be used for several purposes, including a comprehensive review/update of the aquifer conceptual model and numerical model predictions.

3.3 Data Reporting

Data will be collected and validated per procedures identified in the QAPjP (DOE-ID 2002a). Analysis reports will be prepared and issued according to the schedule presented in Table 3-2.

Table 3-2. Reports that are projected to be generated.

Report Type	Contents
Annual report	Groundwater chemistry Water level trend data
Monitoring report decision summary	Groundwater chemistry Water level trend data Recharge Contaminant flux to SRPA estimations Update groundwater modeling if necessary
CERCLA 5-yr review	Data summary Evaluation of data to determine if RAO/RGs will be met Update groundwater modeling if necessary

4. FIELD ACTIVITIES

The following sections describe the field activities and procedures to be used to meet the DQOs described in Section 3. Prior to commencing any sampling activities, a prejob briefing will be held with all work-site personnel to review the requirements of the LTMP, HASP, and other work control documentation, and to verify that all supporting documentation has been completed. Additionally, following sampling, a postjob review will be conducted.

The OU 3-13 Group 5 groundwater monitoring and sampling will include collection of several types of data, including water levels, water samples, and geophysical logs of selected wells.

4.1 Sampling and Monitoring Well Network

Group 5 groundwater monitoring and sampling will include collection of several types of data, including water levels, water samples, and geophysical logs of selected wells. The samples will be collected from a network of existing groundwater wells. The first round of sampling will be considered a baseline sampling round and be nearly inclusive of all groundwater monitoring wells in the vicinity of the INTEC facility and downgradient to the Central Facilities Area landfills. Following this baseline sampling round, monitoring activities will consist of sampling of a selected subset of the INTEC monitoring wells.

In order to monitor COC flux originating from the former INTEC injection well (CPP-23) three wells (USGS-41, USGS-48, and USGS-59) completed through the HI interbed will be sampled below the interbed. This will be accomplished by using inflatable packers to seal the borehole below the HI interbed and then collecting the sample from the interval below the packer. Wells suitable for sampling below the HI interbed must have the following characteristics:

- The HI interbed must be present in the borehole
- The well must be completed as an open borehole through the HI interbed
- The wells must be downgradient from the injection well
- The well must be able to maintain a seal using an inflatable packer.

In order to select appropriate wells for this sampling, lithologic and geophysical logs will be reviewed and a borehole televiewer log will be collected from prospective wells. A preliminary review of the lithologic logs indicates that the wells to be selected for this sampling will come from the following group of wells: USGS-41, USGS-43, USGS-45, USGS-46, USGS-47, USGS-48, USGS-49, USGS-51, USGS-59, and a new well. Based on the review of the geophysical and borehole televiewer logs, the wells chosen to sample below the HI interbed may be revised.

4.2 Sampling and Monitoring Locations

The following discussion includes locations for the groundwater sampling.

4.2.1 Groundwater Sampling Locations

A general discussion of the wells to be included is provided in Section 4.1. The majority of the existing groundwater wells will be included in the baseline sampling network. These wells are listed in

Table 4-1 and shown on Figure 4-1. However, for the long-term monitoring the number of wells will be significantly reduced. These wells are listed in Table 4-2 and shown on Figure 4-2, with the exception of the three wells to be determined to monitor contaminants below the HI interbed. The total number of wells for long-term monitoring is 20 and includes 11 facility monitoring wells, six plume monitoring wells, and three wells to monitor the flux originating from the former INTEC injection well. Possible wells for monitoring the flux from the former injection well below the HI interbed are shown on Figure 4-3.

Table 4-1. The INTEC groundwater wells for baseline sampling.

INEEL Name			
ICPP-MON-A-021	USGS-34	USGS-46	USGS-85
ICPP-MON-A-022	USGS-35	USGS-47	USGS-111
LF2-08	USGS-36	USGS-48	USGS-112
LF2-09	USGS-37	USGS-49	USGS-113
LF2-10	USGS-38	USGS-51	USGS-114
LF2-11	USGS-39	USGS-52	USGS-115
LF2-12	USGS-40	USGS-57	USGS-116
LF3-08	USGS-41	USGS-59	USGS-121
LF3-09	USGS-42	USGS-67	USGS-122
LF3-10	USGS-43	USGS-77	USGS-123
LF3-11	USGS-44	USGS-82	MW-18
USGS-20	USGS-45	USGS-84	

Table 4-2. The INTEC groundwater wells for long-term monitoring.

INEEL Name			
USGS-40	USGS-52	USGS-57	USGS-59 (below HI interbed)
USGS-42	USGS-121	USGS-67	USGS-41 (below HI interbed)
USGS-47	USGS-122	USGS-85	LF2-08
USGS-48	USGS-123	USGS-112	ICPP-MON-A-230
USGS-49	MW-18	LF3-08	
USGS-51		USGS-48 (below HI interbed)	

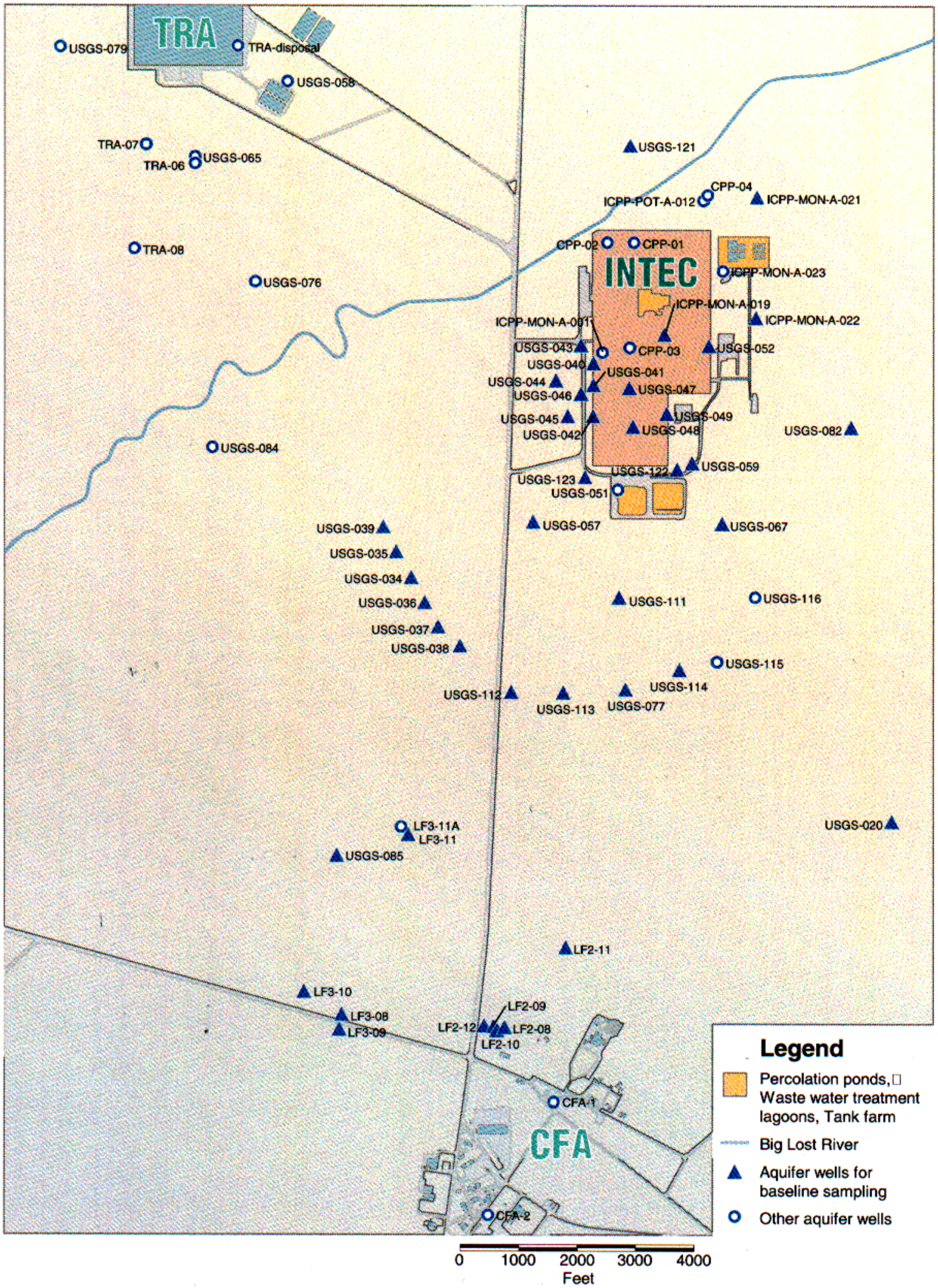


Figure 4-1. The INTEC groundwater wells for baseline sampling and water-level measurement.

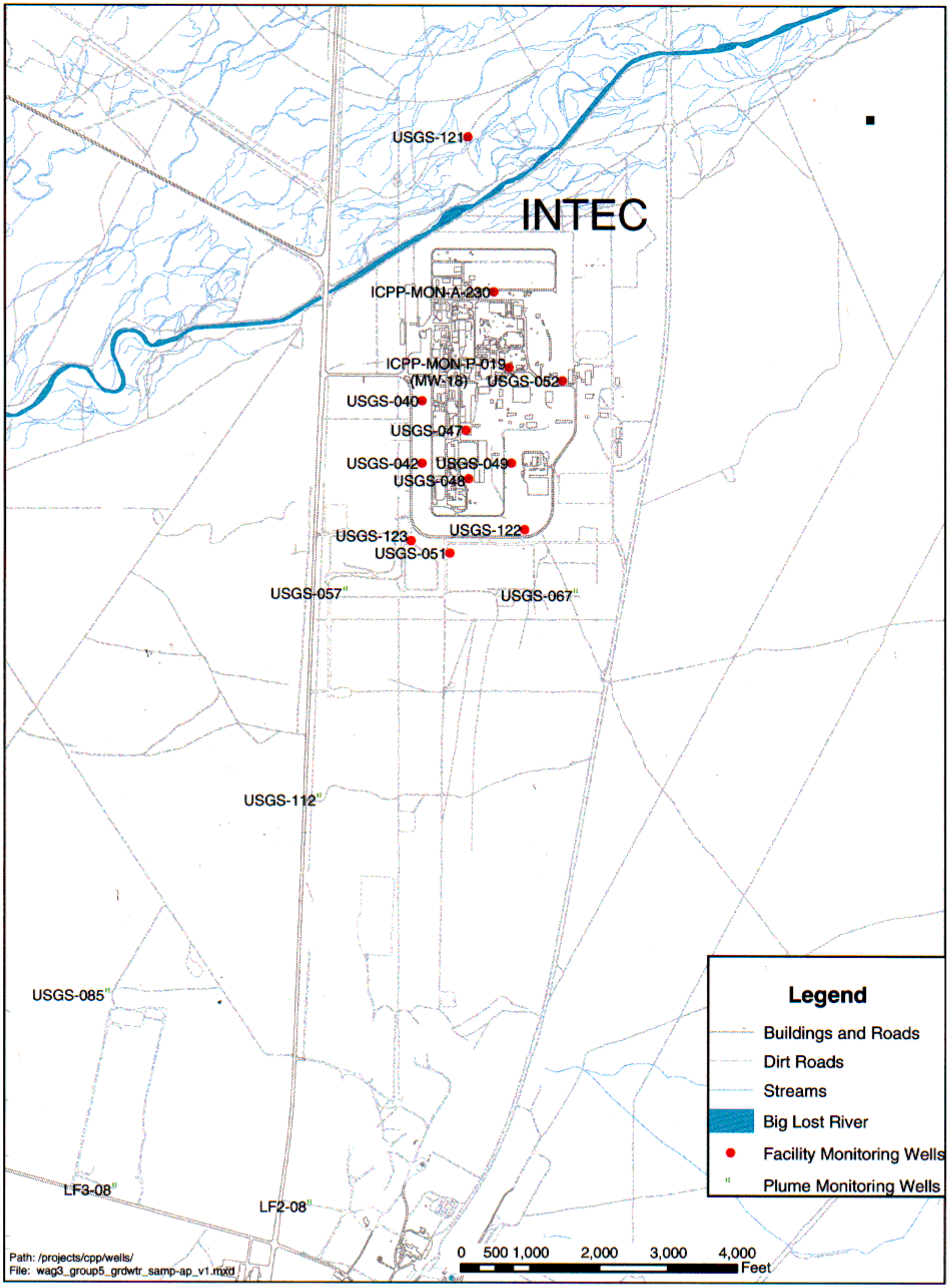


Figure 4-2. INTEC groundwater wells for long-term monitoring.

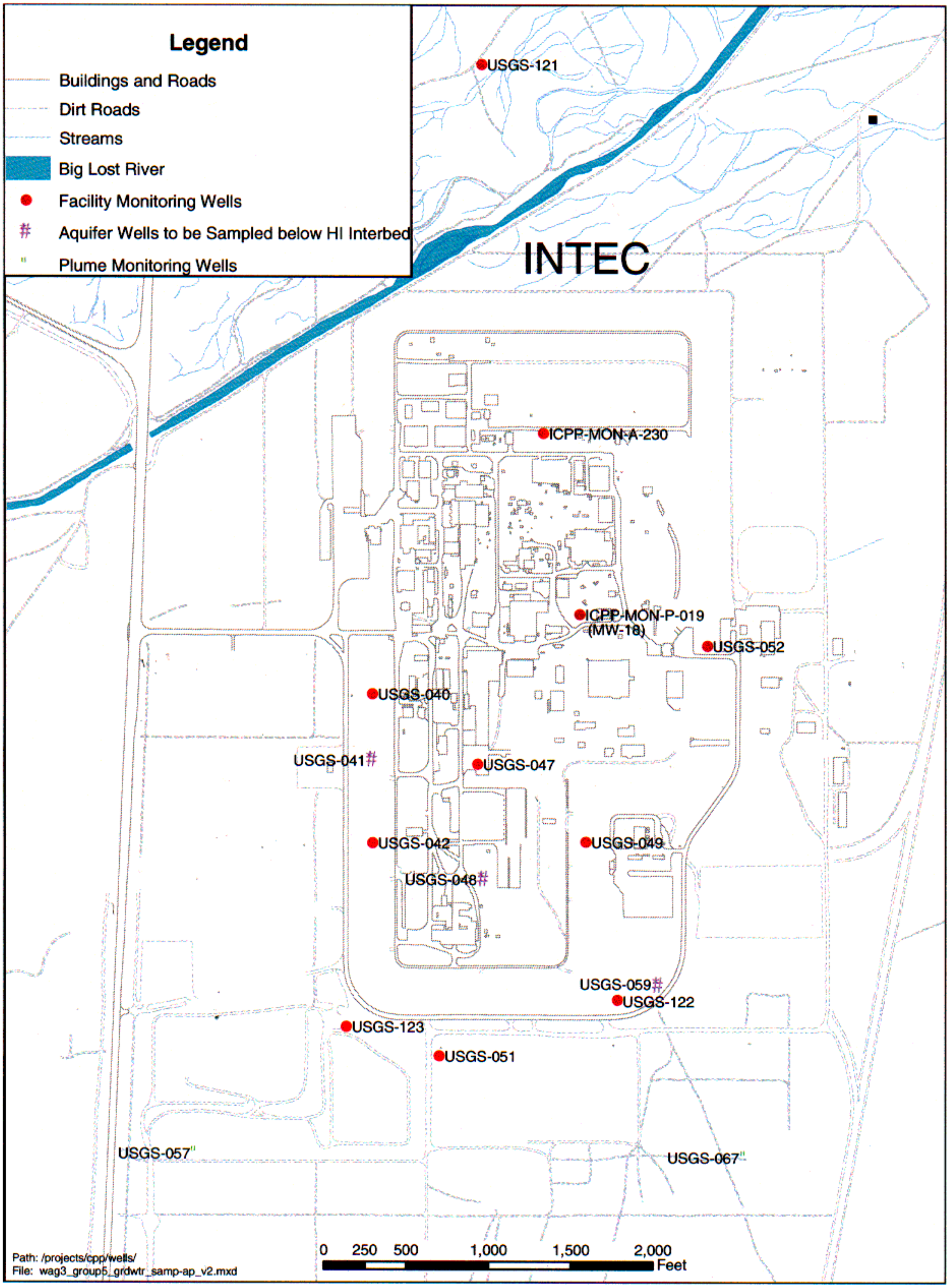


Figure 4-3. INTEC groundwater wells for long-term monitoring of the COC flux from the former injection well below the HI interbed.

All of the selected monitoring wells, with the exception of well MW-18, have dedicated sampling pumps installed.

4.2.2 Groundwater Level Monitoring Locations

With the exception of the production wells, all existing INTEC area groundwater monitoring wells and several wells from surrounding areas will be included in the water level monitoring network. The water level information is essential for the determination of hydraulic gradients in the vicinity of the INTEC facility, to quantify the COC flux across the INTEC fence line, and to refine the site conceptual and OU 3-13 numerical model. The water level information from the surrounding areas will serve to constrain the contouring of the water table along the edges of the area of interest. The wells for the water level monitoring are listed, along with relevant construction information, in Table 4-3 with locations shown on Figure 4-4.

In order to quantify vertical hydraulic gradients across the HI interbed, wells that will be sampled below the HI interbed will also have water level measurements taken above and below the packer after conditions stabilize following installation of the packer.

4.3 Schedule

Table 4-4 lists the sampling and monitoring schedule for Group 5 monitoring under this LTMP.

4.4 Data Types

For groundwater monitoring and sampling, collection of quality assurance/quality control (QA/QC) samples is required. Duplicate samples and field blank samples will be collected at a frequency of 1 per 20 samples or 1 per day, whichever is less. Equipment rinsate samples are required for samples collected from wells that do not have dedicated sampling equipment.

Quality requirements will be satisfied by collecting QA/QC samples (duplicates, field blanks, equipment rinsate, and performance evaluation) during the groundwater sampling according to the schedule presented in Table 4-5.

After the baseline sampling round is completed, sampling will continue as outlined in Table 4-4. The analytes will consist of the COCs identified and hazardous substances. Table 4-6 lists the analytes for the first 7 years of monitoring, after which the analyte list will be reviewed.

Water level measurements will be collected from all existing INTEC facility groundwater monitoring wells.

4.5 Corrective Actions

In the event a discrepancy is discovered by field personnel or auditors, some form of corrective action will be initiated. The level of action taken is related to the level of the discrepancy. Corrective actions can range from field changes caused by unforeseen field conditions to DOE reportable incidents.

Table 4-3. Monitoring wells for the water level monitoring.

INEEL Name				
ICPP-MON-A-021	LF3-11	USGS-42	USGS-57	USGS-112
ICPP-MON-A-022	USGS-20	USGS-43	USGS-59	USGS-113
LF2-08	USGS-34	USGS-44	USGS-65	USGS-114
LF2-09	USGS-35	USGS-45	USGS-67	USGS-115
LF2-10	USGS-36	USGS-46	USGS-76	USGS-116
LF2-11	USGS-37	USGS-47	USGS-77	USGS-121
LF2-12	USGS-38	USGS-48	USGS-82	USGS-122
LF3-08	USGS-39	USGS-49	USGS-84	USGS-123
LF3-09	USGS-40	USGS-51	USGS-85	MW-18
LF3-10	USGS-41	USGS-52	USGS-111	TRA-08

Table 4-4. Groundwater (Group 5) sampling and monitoring frequency.

Sampling or Monitoring Activity	Frequency			
Groundwater sampling	Semiannual for year 1	Annual for years 2 through 7	Biannual for years 8 through 16	Every 5 years for years 17 through 100
Water level measurements	Monthly for year 1	Quarterly for year 2	Semiannual for years 3 through 4	Annual for years 5 through 100

Table 4-5. The QA/QC samples for groundwater sampling.

Activity	Type	Comment
Groundwater sampling	Duplicate	Field duplicates will be collected at a frequency of 1 per 20 samples or 1 per day, whichever is less.
	Field blank	Field blanks will be collected at a frequency of 1 per 20 samples or 1 per day, whichever is less.
	Trip blanks	Trip blanks will be collected when VOC samples are taken at a frequency of 1 per 20 samples or 1 per day, whichever is less.
	Equipment rinsate	Equipment rinsate samples will be collected if the well does not have a dedicated pump. A minimum of 1 rinsate sample will be collected per sampling event, or 1 per day or 1 per 20 samples, whichever is less.
	Performance evaluation	one performance evaluation sample will be submitted for each round of sampling in which radionuclide samples, other than tritium, are collected.

VOC = volatile organic compound

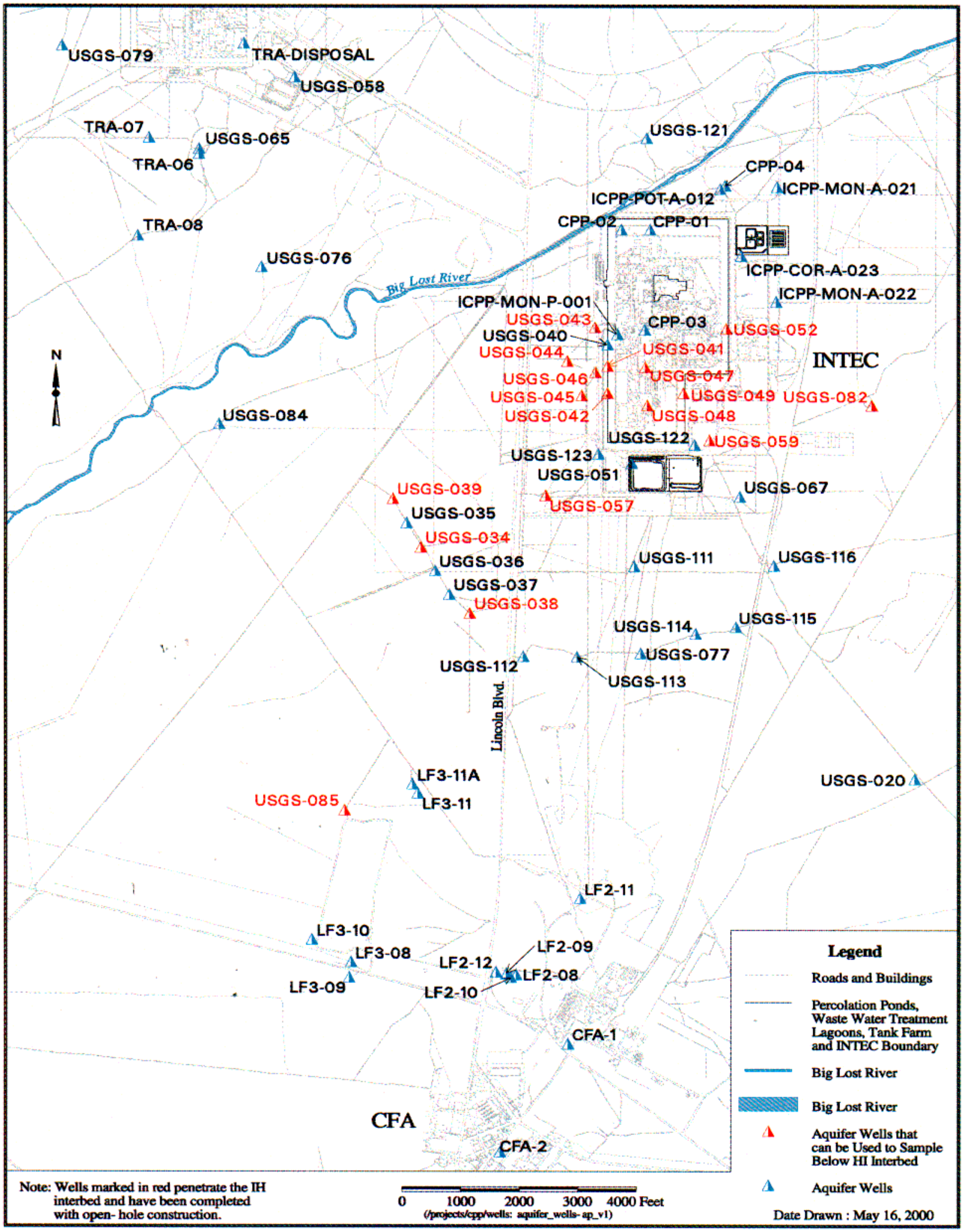


Figure 4-4. INTEC groundwater wells for water levels.

Table 4-6. Group 5 sampling analytes for years 1 through 7.

Field	COCs	Analytical Method[a]	Detection Limits (pCi/L)
Temperature	Gross-alpha	GFP	2
pH	Tritium	LSC	2,000
Alkalinity	Gross-beta	GFP	4
Specific conductance	Technetium-99	LSC or GFP	1
	Iodine-129	MS	0.1
	Strontium-90	GFP	0.8
	Plutonium isotopes (Pu-238, -239, -240, and -241)	ALS	0.05
	Uranium isotopes (U-234, -235, and -238)	ALS	0.05
	Am-241	ALS	0.05
	Np-237	ALS	0.05
	Cs-137	GMS	3
	Mercury	SW7421	0.2 µg/L

a. Methods used for radionuclide analysis are laboratory-specific. The laboratory shall use standard operating procedures based on standard analytical methods provided to the INEEL SAM. The references that may be used to develop the laboratory standard operating procedures are in Wells (1995).

GFP = Gas flow proportional
LSC = Liquid scintillation counting
MS = Mass spectrometry
ALS = Alpha spectometry
GMS = Gamma screen
SW7421 = Cold vapor

5. SAMPLING AND MONITORING PROCEDURES AND EQUIPMENT

This section describes the sampling and monitoring procedures and equipment to be used for the planned groundwater monitoring. Prior to any sampling activities, a presampling meeting will be held to review the requirements of the LTMP and HASP and to ensure all supporting documentation has been completed.

5.1 Groundwater Elevations

Prior to sampling, all groundwater elevations will be measured using either an electronic measuring tape (Solinst brand or equivalent) or a steel-type measure. Measurement of all groundwater levels will be recorded to an accuracy of 0.003 m (0.01 ft).

5.2 Well Purging

All groundwater wells will be purged prior to sample collection. During the purging operation, a Hydrolab (or equivalent) will be used to measure specific conductance, pH, and temperature. A sample for water quality analysis can be collected after a minimum of three well casing volumes of water have been purged from the well and when three consecutive water quality parameters are within the following limits:

pH	± 0.1
Temperature	± 0.5°C
Specific conductance	± 10 µmhos/cm.

5.3 Groundwater Sampling

Prior to sampling, all nondedicated sampling equipment that comes in contact with the water sample will be cleaned. Following sampling, all nondedicated equipment that came in contact with the well water will be decontaminated prior to storage, with the exception that the isopropanol steps for decontamination will be omitted.

Prior to purging, the water level in each well will be measured. The well will then be purged a minimum of three well-casing volumes until the pH, temperature, and specific conductance of the purge water have stabilized, or until a maximum of five well-casing volumes have been removed. A flow-through cell will be used to collect water quality measurements. If the well goes dry prior to purging three well-bore volumes, purging will be considered complete and samples collected thereafter. If parameters are still not stable after five volumes have been removed, samples will be collected and appropriate notations will be recorded in the logbook.

Sample bottles for groundwater samples will be filled to approximately 90 to 95% of capacity to allow for content expansion or preservation. Samples requiring acidification will be acidified to a pH < 2 using ultra-pure nitric acid. The following is the preferred order for sample collection:

1. Temperature, pH, specific conductance, and dissolved oxygen (during purging)
2. Radionuclides (unfiltered)
3. Mercury (unfiltered).

5.4 Personal Protective Equipment

The personal protective equipment (PPE) required for this sampling effort is discussed in the project HASP. Prior to disposal, all PPE will be characterized based on groundwater and field screening results, and a hazardous waste determination shall be made.

5.5 Groundwater Level Monitoring

Water levels will be measured monthly for the first year and quarterly thereafter. All groundwater elevations will be measured using either an electronic measuring tape (Solinst brand or equivalent) or a steel type measure. Measurement of all groundwater levels will be recorded to an accuracy of 0.003 m (0.01 ft).

6. SAMPLING CONTROL

Strict sample control is required on this project. Sample control ensures that unique sample identifiers are used for separate samples. It also ensures that documentation of sample collection information is such that a sampling event may be reconstructed at a later date. The following sections detail unique sample designation, sample handling (including shipping), and radiological screening of samples.

6.1 Sample Identification Code

A systematic 10-character identification (ID) code will be used to uniquely identify all samples. Uniqueness is required to prevent the same ID code from being assigned to more than one sample.

When the first three characters of the code are GWM, this indicates that the sample originated from groundwater monitoring activities. The next three numbers designate the sequential sample number for the project. The seventh and eighth characters represent a two-character set (e.g., 01, 02) for designation of field duplicate samples. The last two characters refer to a particular analysis and bottle type. Refer to the SAP tables in Appendix B for specific bottle code designations.

In this example, a groundwater sample collected in support of the SRPA monitoring might be designated as 5OM09001AB where (from left to right)

- 5OM designates the sample as being collected for Group 5 long-term SRPA groundwater monitoring
- 090 designates the sequential sample number
- 01 designates the type of sample (01 = original, 02 = field duplicate)
- AB designates gross alpha/beta analysis.

A SAP table/database will be used to record all pertinent information (well designation, media, date, etc.) associated with each sample ID code. The SAP tables for the groundwater sampling are presented in Appendix B.

6.2 Sample Designation

6.2.1 General

A SAP table format was developed to simplify the presentation of the sampling scheme for project personnel. The following sections describe the information presented in the SAP table/database (Appendix B).

6.2.2 Sample Description Fields

The sample description fields contain information related to individual sample characteristics.

6.2.2.1 Sampling Activity. The sampling activity field contains the first six characters of the assigned sample number. The sample number in its entirety will be used to link information from other sources (e.g., field data and analytical data) to the information in the SAP table for data reporting, sample tracking, and completeness reporting. The sample number will also be used by the analytical laboratory to track and report analytical results.

6.2.2.2 Sample Type. Data in this field will be selected from the following:

REG for a regular sample

QC for a quality control sample.

6.2.2.3 Media. Data in this field will be selected from the following:

GROUNDWATER for water collected from the groundwater wells

WATER for other water samples (e.g., rinsates, field blanks, trip blanks).

6.2.2.4 Collection Type. Data in this field will be selected from the following:

GRAB for grab

COMP for composite

TBLK for trip blanks

FBLK for field blanks

RNST for equipment rinsates

DUP for duplicate samples.

6.2.2.5 Planned Date. These data, or event identifier, are related to the planned sample collection start date.

6.2.3 Sample Location Fields

This group of fields pinpoints the exact location for the sample in three-dimensional space, starting with the general AREA, narrowing the focus to an exact location geographically, and then specifying the DEPTH in the depth field. The DEPTH identified in the depth field will correspond to the completion interval of the well.

6.2.3.1 Area. The AREA field identifies the general sample-collection area. This field should contain the standard identifier for the INEEL area being sampled. For this investigation, samples are being collected from INTEC; thus, the area identifier will be "INTEC."

6.2.3.2 Location. This field may contain geographical coordinates, x-y coordinates, building numbers, or other location-identifying details, as well as program-specific information such as a borehole or well number. Data in this field will normally be subordinated to the AREA. This information is included on the labels generated by the Sample and Analysis Management (SAM) to aid sampling personnel.

6.2.3.3 Type of Location. The type of location field supplies descriptive information concerning the exact sample location. Information in this field may overlap that in the location field, but it is intended to add detail to the location. An example would be "groundwater well."

6.2.3.4 Depth. The DEPTH of a sample location is the distance in feet from surface level or a range in feet from the surface.

6.2.4 Analysis Types (AT1-AT20)

These fields indicate analysis types (radiological, chemical, hydrological, etc.). Space is provided at the bottom of the form to clearly identify each type. A standard abbreviation should also be provided if possible.

6.3 Sample Handling

Analytical samples for laboratory analyses will be collected in precleaned containers and packaged according to American Society for Testing and Materials or EPA-recommended procedures. The QA samples will be included to satisfy the QA/QC requirements for the program as outlined in the QAPjP and in Section 4. Qualified analytical laboratories (SAM approved) will analyze the samples.

6.3.1 Sample Preservation

Water samples will be preserved as indicated in the analytical laboratory SOW.

6.3.2 Chain-of-Custody Procedures

The chain-of-custody procedures will be followed per applicable procedures, and the QAPjP (DOE-ID 2002a). Sample containers will be stored in a secured area accessible only to the field team members.

6.3.3 Transportation of Samples

Samples will be packaged and shipped in accordance with the regulations issued by the Department of Transportation (DOT) (49 CFR 171 through 49 CFR 178) and EPA sample handling, packaging, and shipping methods (40 CFR 262).

6.3.3.1 Custody Seals. Custody seals will be placed on all shipping containers in such a way as to ensure that tampering or unauthorized opening does not compromise sample integrity. Clear plastic tape will be placed over the seals to ensure that the seals are not damaged during shipment.

6.3.3.2 On-Site and Off-Site Shipping. An on-Site shipment is any transfer of material within the perimeter of the INEEL. Site-specific requirements for transporting samples within INEEL boundaries and those required by the shipping and receiving department will be followed. Shipment within the INEEL boundaries will conform to DOT requirements as stated in 49 CFR Parts 171–178. Off-Site shipment will be coordinated with Packaging and Transportation personnel, as necessary, and will conform to all applicable DOT requirements.

6.4 Radiological Screening

Following sample collection, samples will be surveyed for external contamination, and field screened for radiation levels. If necessary, a gamma-screening sample will be collected and submitted to the Radiation Measurements Laboratory (RML) located at TRA-620 for a 20-minute analysis prior to shipment off-Site. Determination of the need for RML screening will be made by the radiological control technician (RCT) in the field.

If it is determined that the contact readings on the samples exceed 200 mrem/hr beta/gamma, the samples will be held for analysis in the INTEC Remote Analytical Laboratory.

7. QUALITY ASSURANCE/QUALITY CONTROL

A revision to the existing Quality Assurance Project Plan (QAPjP) has been developed for INEEL WAGs 1, 2, 3, 4, 5, 6, 7, 10, and the Inactive Sites Department (DOE-ID 2002a). This plan pertains to all environmental, geotechnical, geophysical, and radiological testing, analysis, and data review. This section details the field elements of the QAPjP to support field operations during the groundwater sampling and monitoring.

7.1 Project Quality Objectives

The QA objectives specify the measurements that must be met to produce acceptable data for a project. The technical and statistical qualities of these measurements must be properly documented. Precision, accuracy, and completeness are quantitative parameters that must be specified for physical/chemical measurements. Comparability and representativeness are qualitative parameters.

The QA objectives for this project will be met through a combination of field and laboratory checks. Field checks will consist of collecting field duplicates, equipment blanks, and field blanks. Laboratory checks consist of initial and continuing calibration samples, laboratory control samples, matrix spikes, and matrix spike duplicates. Laboratory QA is detailed in the QAPjP and is beyond the scope of this LTMP.

7.1.1 Field Precision

Field precision is a measure of the variability not due to laboratory or analytical methods. The three types of field variability or heterogeneity are spatially within a data population, between individual samples, and within an individual sample. Although the heterogeneity between and within samples can be evaluated using duplicate and/or sample splits, overall field precision will be calculated as the relative percent difference between two measurements, or relative standard deviation between three or more measurements. The relative percent difference or relative standard deviation will be calculated as indicated in the QAPjP, for duplicate samples, during the data validation process. Precision goals have been established for inorganic Contract Laboratory Program methods by the EPA (EPA 1993) and for radiological analyses in applicable procedures.

7.1.2 Field Accuracy

Cross-contamination of samples during collection or shipping could yield incorrect analytical results. To assess the occurrence of any cross-contamination events, field blanks will be collected to evaluate any potential impacts. One goal of the sampling program is to eliminate any cross-contamination associated with sample collection or shipping. Duplicate samples to assess precision will be co-located and collected by field personnel at a minimum frequency of one duplicate for every 20 samples or one duplicate sample per day, whichever is less as shown in Table 4-5. These duplicates will be collected for water (blanks). Sample identifications are provided in the SAP tables in Appendix B.

Accuracy of field-instrumentation will be maintained by calibrating all instruments used to collect data and cross-checking with other independently collected data.

7.1.3 Representativeness

Representativeness is evaluated by assessing the accuracy and precision of the sampling program and expressing the degree to which samples represent actual site conditions. In essence, representativeness is a qualitative parameter that addresses whether the sampling program was properly designed to meet the DQOs. The representativeness criterion is best satisfied by confirming that sampling locations are selected properly and a sufficient number of samples are collected to meet the requirements stated in the DQOs (see Section 3.1).

7.1.4 Comparability

Comparability is a qualitative measure of the confidence with which one data set can be compared to another. These data sets include data generated by different laboratories performing this work, data generated by laboratories in previous studies, data generated by the same laboratory over a period of several years, or data obtained using different sampling techniques or analytical protocols. For field aspects of this program, data comparability will be achieved using standard methods of sample collection and handling.

Data collection frequency and long-term trends will ensure comparability of monitoring data.

7.1.5 Completeness

Field completeness will be assessed by comparing the number of samples collected to the number of samples planned. Field sampling completeness is affected by such factors as equipment and instrument malfunctions, and insufficient sample recovery. Completeness can be assessed following data validation and reduction. The completeness goal for this project is 100% for critical activities and 90% for noncritical activities. Well installations (see DOE-ID 2002d) are considered critical activities, while the collection of individual samples are noncritical.

7.2 Field Data Reduction

The reduction of field data is important to ensure that there have been no errors in sample labeling and documentation. This includes cross-referencing the SAP table presented in Appendix B with sample labels, logbooks, and chain-of-custody forms. Prior to sample shipment to the laboratory, field personnel will ensure that all field information is properly documented.

7.3 Data Validation

All laboratory-generated data will be validated to Level B. Data validation will be performed in accordance with applicable procedures. Field-generated data (e.g., matric potential, moisture measurements, and water levels) will be validated through the use of properly calibrated instrumentation, comparing and cross-checking data with independently gathered data, and recording data collection activities in a bound field logbook.

7.4 Quality Assurance Objectives for Measurement

The QA objectives are specifications that the monitoring and sampling measurements identified in the QAPjP must meet to produce acceptable data for the project. The technical and statistical quality of these measurements must be properly documented. Precision, accuracy, method detection limits, and completeness must be specified for hydraulic and chemical measurements. Specific QA objectives are included in DOE-ID 2002a.

8. DATA MANAGEMENT/DATA ANALYSIS AND UNUSUAL OCCURRENCES

Analytical data that results from groundwater sampling will be managed and maintained by the Integrated Environmental Data Management System (IEDMS). The Hydrogeologic Data Repository (HDR) will supply long-term management of the field data. This section discusses the approach to managing the data, analysis of data, and suggested responses to unusual occurrences.

8.1 Data Management

The following discussion presents the various processes associated with managing the data collected in as part of the LTMP. Group 5 data management will follow guidelines specified in the following section.

8.1.1 Laboratory Analytical Data

Analytical data are managed and maintained in the IEDMS. The components that make up IEDMS provide an efficient and accurate means of sample and data tracking.

The IEDMS performs sample tracking throughout all phases of a sampling project, beginning with the assignment of unique sample identification numbers using the SAP application program. The SAP Application produces a SAP table, which contains a list of sample identification numbers, sample demographics (area, location, and depth), and the planned analyses. Once the SAP application database is finalized, it is used to automatically produce sample labels and tags (with or without barcode identification). In addition, sampling guidance forms can be produced for the field sampling team that provide information such as sampling location, requested analysis, container types, and preservative.

When the analytical data package, or sample delivery group (SDG), is received, it is logged into the IEDMS journaling system, an integrated subsystem of the sample tracking system, which tracks the SDG from data receipt to Environmental Restoration Information System (ERIS). Cursory technical reviews on the data packages are performed to assess the completeness and technical compliance with respect to the project's analysis-specific Task Order Statement of Work or SOW. Any deficiencies, resubmittal actions, and special instructions to the validator are recorded on the Cursory Subcontractual Compliance Review form using the Laboratory Performance Indicator Management System. This form is sent to the validator with the data package (when required).

Errors in the data package are resolved among the SAM chemist(s), the originating lab, and the IEDMS staff. Data validity is assured by the validator through the assignment of data validation flags. The validator generates a limitation and validation (LAV) report, which gives detailed information on the assignment of data qualifier flags. A copy of the form 1 accompanies the LAV-report with the validator assigned data qualifier flags and any changes to the data result. The validated data results, along with the data qualifier flags, are entered into the IEDMS database. From this database, a summary table (Result Table) is generated. The Result Table summarizes the sample identification numbers, sample logistics, analytes, and results for each particular type of analysis (such as inorganic, radiological, organic) from the sampling effort. The field sample data from this database is also uploaded to ERIS.

8.1.2 Field Data

Field data includes all data that is non-chemical analytical data generated in support of OU 3-13 Group 5. This data will be managed according to the requirements specified in the *Data Management*

Plan for Operable Unit 3-13, Group 4 and Group 5 Monitoring Well Installation and Monitoring Project (DOE-ID 2000). Final field data will reside in the HDR for long-term management. The HDR will maintain hard copies of the data reports along with electronic copies of the final field data.

8.2 Data Analysis

8.2.1 Laboratory Analytical Data

The validated data will be used in flux calculations to determine if contaminant fluxes to the SRPA from the vadose zone are decreasing as predicted by the OU 3-13 model, as well as determining if the former injection well is acting as a residual source of groundwater contamination in the vicinity of INTEC.

8.2.2 Field Data

Field data will be analyzed using methods that are appropriate for the data types and specific field conditions. Some data sets may be filtered. Analysis will include recognized methods and techniques that are used with the specific data types and may include statistical processes. Field data will be compared to modeled values (as discussed above). This may require that the groundwater be remodeled or, at least, that the model be recalibrated using field-determined values.

8.2.3 Decision Process

The data obtained under this monitoring program will be evaluated and incorporated into an updated OU 3-13 aquifer numerical model to determine if the COC fluxes from within the INTEC facility fence line have been reduced sufficiently to meet the COC concentration limits in the SRPA in 2095.

A summary of the process to update the numerical simulation of the monitoring data follows:

1. Refine the existing conceptual model describing the physical and chemical processes that will be represented in the simulation model.

2. Refine the existing parameterization of the model that meets the conceptual model assumptions. The OU 3-13 RI/FS model parameterization will be the primary source for this initial parameterization.

3. Calibrate the model. The calibration will consist of two parts. The first part will be an evaluation of the model structure that will determine which attributes of the subsurface model have the largest effect on predicted peak concentrations in the aquifer. The second part will consist of adjusting parameter values to improve model agreement to the field data.

4. Summarize the sensitivity and uncertainty analysis and how the results will be used.

5. Summarize the predictive model results and COC concentration predictions at the performance measurement point in 2095.

8.3 Unusual Occurrences

Unusual occurrences are situations that are unforeseen, unanticipated, or unexpected. They may occur in chemical data sets or as field-related data and observations. An example of an unusual occurrence is detection of a COC where previously it was undetected.

The following is meant to provide a process for resolving an unusual occurrence rather than a method for dealing with each specific unusual occurrence. The following steps will be taken to resolve an unusual occurrence:

- Record the unusual occurrence and supporting observations in the field log book.
- Validate unusual occurrence (e.g., reanalyze the sample if any remaining) and report to program manager as soon as possible.
- Determine if the occurrence is a one-time event or is recurring.
- If the unusual occurrence is of a significant nature (significant is anything that can potentially increase contaminant flux to the aquifer with concentration levels above MCLs, e.g., large persistent increases in water levels), it will be reported to the appropriate program managers.
- If the unusual occurrence is not of a significant nature (e.g., malfunctioning instrument that is reporting increases in water levels), it will be resolved by the technical leader and is a nonissue.
- For significant unusual occurrences, take appropriate action, which may include increasing sampling (in network, not just individual well) and/or monitoring frequency, or reviewing the ROD for implementation of a remedial action (for example, curtailing steam condensate discharges to the subsurface).

9. PROJECT ORGANIZATION AND RESPONSIBILITIES

The organization structure for this project reflects the resources and expertise required to perform the work, while minimizing the risks to worker health and safety. As outlined in the FFA/CO, each of the three signatory agencies (DOE, EPA, Idaho Department of Environmental Quality) has assigned a WAG project manager (PM). The WAG project manager's responsibility is to oversee the effective implementation of actions stated in final action documents such as the INTEC OU 3-13 ROD. This section is divided into two subsections that outline the responsibilities of key Bechtel BWXT Idaho, LLC (BBWI) work-site personnel only. Job titles of the individuals who will be filling key roles at the work site, and lines of responsibility and communication are shown in Figure 9-1. Section 9.2 discusses those positions that will supply support for the activities in the field but are not required to be onsite.

9.1 Job-Site Personnel

This section lists the expected personnel on the job site.

9.1.1 Project Manager

The PM coordinates all document preparation, file, laboratory, and modeling activities associated with this project and is responsible for the overall scope, schedule, and budget of this project. The PM will ensure that all activities conducted during the project comply with the following:

- INTEC site director requirements
- Management control procedures (MCPs) and program requirements directives (PRDs)
- All applicable Occupational Safety and Health Administration (OSHA), EPA, DOE, DOT, and State of Idaho requirements
- The QAPjP, the project HASP, the project WMP, and this LTMP.

The PM will oversee preparation, review, and implementation of the LTMP to ensure work is performed as planned. The PM is responsible for (1) developing resource loaded, time-phased control account plans based on the project's technical requirements, budgets, and schedules and (2) assigning project tasks. Other functions and responsibilities of the PM related to completion of field activities include the following:

- Developing the site-specific plans required by the Environmental Restoration (ER) Program such as Work Plans, environmental HASPs, SAPs, etc.
- Ensuring that project activities and deliverables meet schedule and scope requirements as described in the FFA/CO Attachment A "Action Plan for Implementation of the Federal Facility Agreement and Consent Order" (DOE-ID 1991) and applicable guidance
- Coordinating and interfacing with units within the program support organization on issues relating to QA, environmental safety and health (ES&H), and National Environmental Policy Act (NEPA) support for the project

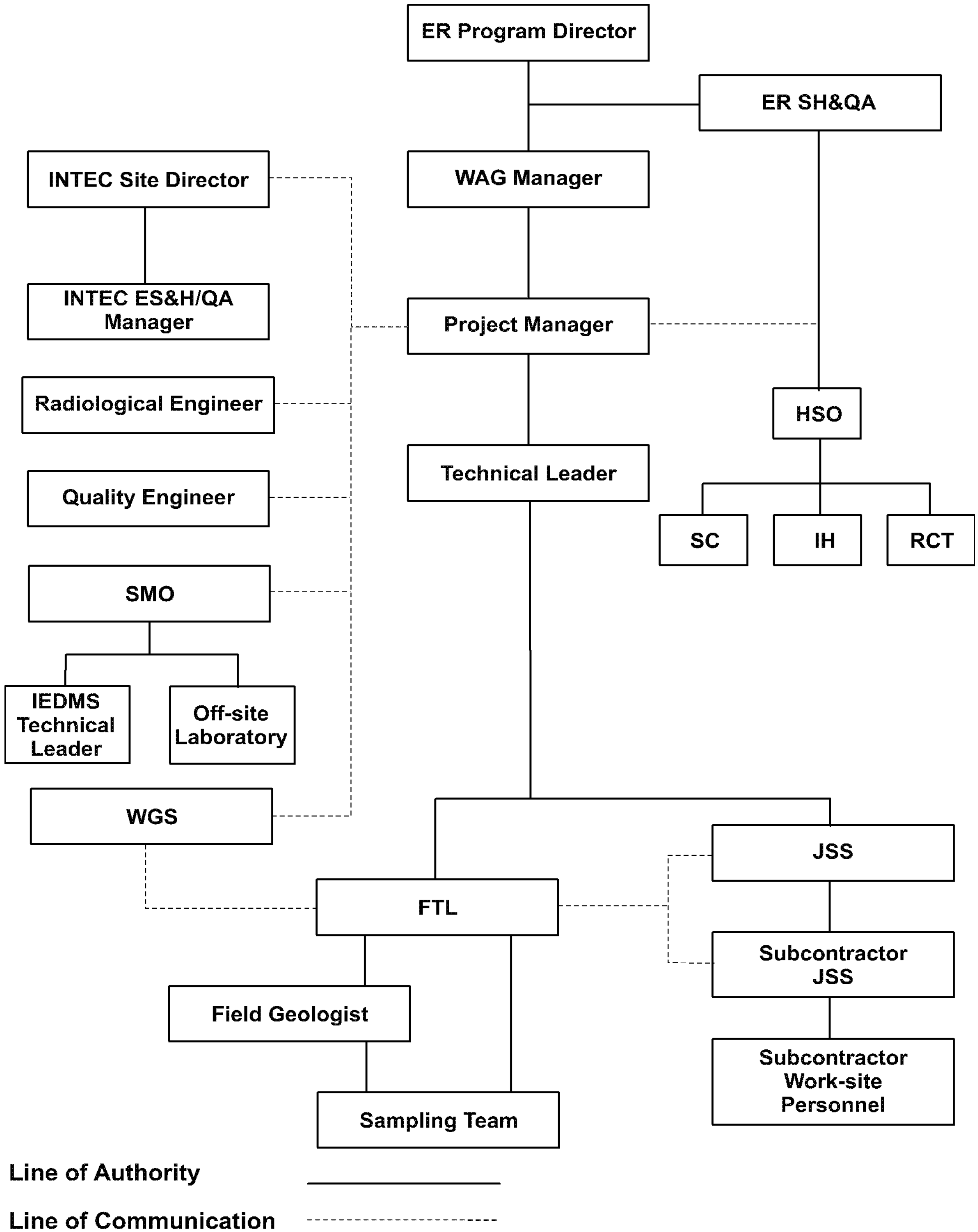


Figure 9-1. The BBWI organization structure for this project.

- Coordinating the site-specific data collection, review for technical adequacy, and data input to an approved database such as the ERIS

- Coordinating and interfacing with subcontractors to ensure milestones are met, adequate management support is in place, technical scope is planned and executed appropriately, and project costs are kept within budget.

9.1.2 Technical Leader

The technical leader provides technical expertise and oversees the preparation, review, and implementation of the LTMP to ensure work is technically correct. The technical leader works with the PM to ensure that

- Site-specific plans required by the ER program, such as Work Plans, HASPs, SAPs, etc., are prepared

- Activities and deliverables meet schedule and scope requirements as described in the FFA/CO Attachment A "Action Plan for Implementation of the Federal Facility Agreement and Consent Order" (DOE-ID 1991) and applicable guidance

- Issues relating to QA, ES&H, and NEPA support for the project are resolved.

The technical leader may function as the field team leader (FTL) at the job site.

9.1.3 Field Team Leader

The FTL represents the ER organization at the job site with delegated responsibility for the safe and successful completion of the project. The FTL works with the PM to manage field sampling or operations, and to execute the work plan. The FTL enforces work-site control, documents activities, and may conduct the daily safety briefings at the start of the shift. Health and safety issues must be brought to the attention of the FTL.

If the FTL leaves the job site, an alternate individual will be appointed to act as the FTL. Persons who act as the FTL on the job site must meet all the FTL training requirements as outlined in the project HASP. The identity of the acting FTL shall be conveyed to work-site personnel, recorded in the FTL logbook, and communicated to the INTEC director, or designee, when appropriate.

The FTL shall comply with the requirements by completing the briefings and reviews, and submitting the documentation to the INTEC site director and ER Environment, Safety and Health/Quality Assurance (ES&H/QA) manager. The FTL shall complete the job requirements checklist (JRC).

The FTL will be responsible for ensuring compliance with waste management requirements and coordinating such activities with the environmental compliance coordinator and/or designee.

9.1.4 Health and Safety Officer

The health and safety officer (HSO) is the person located at the work site who serves as the primary contact for health and safety issues. The HSO shall assist the FTL on all aspects of health and safety (which includes complying with the enhanced work planning process), and is authorized to stop work at the work site if any operation threatens worker or public health and/or safety. The HSO may be assigned other responsibilities, as stated in other sections of the project HASP, as long as they do not interfere with the primary responsibilities stated here. The HSO is authorized to verify compliance with directed actions, as appropriate. Other ES&H professionals at the work site (safety coordinator [SC], industrial hygienist [IH], RCT, radiological engineer, environmental compliance coordinator, and facility representative[s]) may support the HSO, as necessary.

Any persons assigned as the HSO, or alternate HSO, must be qualified (per OSHA definition) to recognize and evaluate hazards, and will be given the authority to take or direct actions to ensure that workers are protected. While the HSO may also be the IH, SC, or in some cases the FTL at the work site, (depending on the hazards, complexity and size of the activity involved, and with concurrence from the ER ES&H/QA manager) other task-site responsibilities of the HSO must not conflict (philosophically or in terms of significant added volume of work) with the role of the HSO at the work site.

If it is necessary for the HSO to leave the work site, an alternate individual will be appointed by the HSO to fulfill this role. The identity of the acting HSO will be recorded in the FTL logbook, and work-site personnel will be notified.

9.1.5 Industrial Hygienist

The assigned IH is the primary source for information regarding nonradiological hazardous and toxic agents at the task site. The IH will assist the FTL in completing the JRC, and will assess the potential of worker exposure to hazardous agents according to applicable manuals, MCPs, and accepted industry IH practices and protocol. By participating in work-site characterization, the IH assesses and recommends appropriate hazard controls for the protection of work-site personnel, operates and maintains airborne sampling and monitoring equipment, and reviews for effectiveness, and recommends and assesses the use of PPE required in the project HASP (recommending changes as appropriate).

Following an evacuation, the IH, in conjunction with other recovery team members, will assist the FTL in determining whether conditions exist for safe work-site reentry as described in the project HASP. Personnel showing health effects (signs and symptoms) resulting from possible exposure to hazardous agents will be referred to an Occupational Medical Program physician by the IH, their supervision, or the HSO. The IH may have other duties at the work site, as specified in the project HASP, or in PRDs and/or MCPs. During emergencies involving hazardous materials, airborne sampling and monitoring results will be coordinated with members of the Emergency Response Organization.

9.1.6 Radiological Control Technician

The assigned RCT is the primary source for information and guidance on radiological hazards. The RCT will be present at the job site during any work operations when a radiological hazard to personnel may exist or is specifically anticipated. The RCT will also assist the FTL in completing the JRC. Responsibilities of the RCT include radiological surveying of the work site, equipment, and samples; providing guidance for radioactive decontamination of equipment and personnel; and accompanying affected personnel to the nearest INEEL medical facility for evaluation if significant radiological exposure occurs. The RCT may have other duties at the job site as specified in the project HASP or in PRDs and/or MCPs.

9.1.7 Job Site Supervisor

The job site supervisor (JSS) serves as the representative for the Facilities, Utilities, and Maintenance (FUM) Department, Site Services Branch, at the task site. The JSS is the supervisor of crafts and other FUM personnel assigned to work at the job site. The JSS is the interface between FUM and ER, and works closely with the FTL at the work site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The JSS and FTL work as a team to accomplish day-to-day operations at the job site; identify and obtain additional resources needed at the job site; and interact with the HSO, IH, SC, RCT, and/or radiological engineer on matters regarding health and safety. The JSS, like the FTL, must be informed about any health and safety issues that arise at the work site and may stop work at the job site if an unsafe condition exists. The JSS also shares the FTL's responsibility for daily prejob briefings.

9.1.8 Subcontractor Job Site Supervisor

A subcontractor JSS serves as the subcontractor safety representative at the work site. The subcontractor JSS may also serve as the subcontractor PM. The subcontractor JSS is the subcontractor field supervisor for subcontractor personnel assigned to work at the job site. The subcontractor JSS and FTL work as a team to accomplish day-to-day operations at the work site; identify and obtain additional resources needed at the work site; and interact with the HSO, IH, SC, RCT, and/or radiological engineer on matters regarding health and safety. The subcontractor JSS, like the FTL, must be informed about any health and safety issues that arise at the work site and may stop work at the job site if an unsafe condition exists. The subcontractor JSS will provide information to the FTL regarding the nature of their work for input at the daily prejob briefing.

9.1.9 Sampling Team

The sampling team will perform the onsite tasks necessary to collect, package, and ship samples. Tasks may include the physical collection of sample material, completion of chain-of-custody and shipping request forms, and proper packaging of samples in accepted shipping containers (property labels and sealed coolers). The size and makeup of the sampling team will be dependent on the extent of the sampling task. The IH and RCT will support the sampling team when sampling is performed inside the contamination area. The sampling team may be led by the FTL or a designated sample team lead (STL).

9.1.10 Work Site Personnel

All work-site personnel shall understand and comply with the requirements of the project HASP. The FTL or JSS will brief work-site personnel at the start of each shift. During the prejob briefing all daily tasks, associated hazards, engineering and administrative controls, required PPE, work control documents, and emergency conditions and actions will be discussed. Input from the project HSO, IH, RCT, and/or radiological engineer to clarify task health and safety requirements will be provided. All personnel are encouraged to ask questions regarding site tasks and provide suggestions on ways to perform required tasks in a more effective manner based on the lessons learned from previous day's activities.

Once at the job site, personnel are responsible for identifying any potentially unsafe situations or conditions and reporting them to the FTL, JSS, or HSO for corrective action. **All work-site personnel are authorized to stop work immediately if they perceive that an unsafe condition poses imminent danger. They must then notify the FTL, JSS, or HSO of the unsafe condition.**

9.2 Supporting Personnel

The following subsections list the expected support personnel.

9.2.1 Environmental Restoration Director

The ER director has ultimate management and operation contractor responsibility for the technical quality of all projects, maintaining a safe environment, and the safety and health of all personnel during field activities performed by or for the ER program. The ER director provides technical coordination and interfaces with DOE-ID. The ER director ensures that

- Project/program activities are conducted according to all applicable federal, state, local, and company requirements and agreements.
- Program budgets and schedules are approved and monitored to be within budgetary guidelines.
- Personnel, equipment, subcontractors, and services are available.
- Direction is provided for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.

9.2.2 INTEC Site Area Director

The INTEC site area director (SAD) has the authority and responsibility to ensure proper ownership review of all activities within the INTEC facility for all work processes and packages. The SAD's authority includes, but is not limited to, the following:

- Establishing and executing monthly, weekly, and daily operating plans
- Executing the INTEC ES&H/QA program
- Executing the enhanced work planning for INTEC
- Executing the Voluntary Protection Program in the area
- Ensuring environmental compliance within the area
- Executing that portion of the voluntary compliance order that pertains to the area
- Correcting the root cause functions of the accident investigation in the area
- Correcting the root cause functions of the voluntary compliance order for the area.

9.2.3 CFA Site Area Director

Since much of the scope of this project is outside the INTEC fence line, the project activities must be coordinated with CFA management and personnel. The CFA SAD's authority is similar to that described above for the INTEC SAD.

9.2.4 ER SH&QA Manager

The ER safety, health, and quality assurance (SH&QA) manager, or designee, is responsible to ensure that ES&H oversight is provided for all ER programs and projects. This position reports to and is accountable to the ER director. The ER S&H/QA manager performs line management review, inspections, and oversight. Project or program management will bring all ES&H/QA concerns, questions, comments, and disputes that can not be resolved by the HSO or one of the assigned ES&H professionals to the ER SH&QA manager or the INTEC ES&H/QA manager.

9.2.5 INTEC ES&H/QA Manager

The INTEC ES&H/QA manager, or designee, is responsible to ensure that ES&H oversight is provided for all ER programs and projects. This position reports to and is accountable to the ER director.

9.2.6 Safety Coordinator

The assigned SC reviews work packages, periodically observes work-site activity, assesses compliance with the applicable company manuals, signs safe work permits, advises the FTL on required safety equipment, answers questions on safety issues and concerns, and recommends solutions to safety issues and concerns that arise at the work site. The SC shall assist the FTL in completing the JRC. The SC may have other duties at the work site as specified in the project HASP, or in PRDs, and/or MCPs. The fire protection engineer's function is included under SC designation, and is the person assigned to review work packages and perform field assessments for fire protection controls.

9.2.7 Radiological Engineer

The radiological engineer is the primary source for information and guidance relative to the evaluation and control of radioactive hazards at the work site. If a radiological hazard exists or occurs at the job site, the radiological engineer makes recommendations to minimize health and safety risks to work-site personnel. Responsibilities of the radiological engineer include (1) performing radiation exposure estimates and as low as reasonably achievable evaluations, (2) identifying the types(s) of radiological monitoring equipment necessary for the work, (3) advising the FTL and RCT of changes in monitoring or PPE, and (4) advising personnel on work-site evacuation and reentry. The radiological engineer may also have other duties to perform as specified in the project HASP or in the applicable company manuals.

9.2.8 Environmental Compliance Coordinator

The assigned environmental compliance coordinator monitors and advises the PM, technical leader, and FTL performing job-site activities on environmental issues and concerns by ensuring compliance with DOE orders, EPA regulations, and other regulations concerning the effect of work-site activities on the environment.

The environment compliance coordinator provides support surveillance services for hazardous waste storage and transport, and surface-water/storm-water runoff control. The environmental compliance coordinator shall assist the FTL in completing the JRC.

9.2.9 Quality Engineer

The quality engineer provides guidance on the work-site quality issues, when requested. The quality engineer observes work-site activities and verifies that work-site operations comply with quality requirements pertaining to these activities. The quality engineer identifies activities that do not comply or have the potential for not complying with quality requirements and suggests corrective actions.

9.2.10 Sample and Analysis Management

The INEEL SAM has the responsibility to obtain laboratory services as required to meet the needs of this project. They will also ensure that data generated from samples meet the needs of the project by validating all analytical laboratory data to resident protocol, and ensuring that data is reported to the project in a timely fashion as required by the FFA/CO.

The laboratory contracted by the SAM will have overall responsibility for laboratory quality, laboratory cost control, laboratory personnel management, and adherence to agreed-upon laboratory schedules. Responsibilities of the laboratory personnel include preparing analytical reports, ensuring chain-of-custody information is complete, and ensuring all QA/QC procedures are implemented in accordance with SAM task order statements of work and master task agreements generated by the SAM.

9.2.11 Integrated Environmental Data Management System Technical Leader

The IEDMS technical leader will interface with the PM during the preparation of the SAP database. This individual also provides guidance on the appropriate number of field quality control samples required by the QAPjP. The sample numbers used by the project are unique from all others ever assigned by IEDMS. The preparation of the plan database, along with completion of the SAM request services form, initiates the sample tracking and sample waste tracking activities performed by the SAM.

9.2.12 Waste Generator Services Personnel

Waste Generator Services (WGS) personnel provide support to the project in the area of waste segregation, storage, and disposal. For this project a WGS engineer will be assigned to take care of all waste generated from the tasks conducted for this project.

9.2.13 Occasional Workers

All persons who may be on the project work site, but are not part of the field team, are considered occasional workers for the purposes of this project (e.g., surveyor, equipment operator, or other crafts personnel not assigned to the project). A person shall be considered "onsite" when they are present in or beyond the designated support zone. Occasional workers will be deemed occasional site workers per 29 CFR 1910.120 and 29 CFR 1926.65, and must meet minimum training requirements for such workers as described in the OSHA standard and any additional site-specific training as identified in the project HASP.

All occasional workers, including contractor and subcontractor employees who are not working on the project, or nonessential representatives of DOE and/or state and federal regulatory agencies, may not proceed beyond the support zone without receiving job-specific HASP training, signing the job-specific HASP training acknowledgment form, receiving a full safety briefing, wearing the appropriate PPE, and providing proof of meeting the minimum training requirements specified in the project HASP. A fully trained job-site representative (such as the FTL, JSS, HSO, or a designated alternate) will escort occasional workers at all times while on the task site.

9.2.14 Visitors

All visitors with official business at the project task site, including contractor and subcontractor personnel, representatives of DOE, and/or state or federal regulatory agencies, may not proceed beyond the support zone without receiving project-specific HASP training, signing the HASP training acknowledgment form, receiving a full safety briefing, wearing the appropriate PPE, and providing proof of meeting the minimum training requirements as specified in the project HASP. A fully trained job-site representative (such as the FTL, JSS, HSO or a designated alternate) will escort visitors at all times while at the work site.

A casual visitor to the work site is a person who does not have a specific task to perform or other official business to conduct at the work site. **Casual visitors are not permitted at the job site(s) for the Group 5 groundwater sampling and monitoring.**

10. WASTE MANAGEMENT

Remediation-derived waste generated during the OU 3-13, Group 5, groundwater sampling may include the following:

- Contaminated PPE, wipes, bags, and other refuse
- Contaminated sampling equipment
- Purge water
- Used sample containers and disposable sampling equipment
- Aqueous and liquid organic analytical wastes
- Analytical debris (e.g., glassware, pipettes).

The disposition and handling of waste for this project will be consistent with the project-specific WMP for OU 3-13, Group 5 groundwater (DOE-ID 2003). However, field personnel will be responsible for the initial segregation of waste based on sampling conditions and/or location. The segregation of waste will play an important role in the reduction of waste generated by this project.

11. HEALTH AND SAFETY

Work performed for the Group 5 LTMP will be performed in accordance with the project HASP (INEEL 2003).

12. DOCUMENT MANAGEMENT

Subsection 12.1 summarizes document management and sample control. Documentation includes field logbooks used to record field data and sampling procedures, chain-of-custody forms, and sample container labels. The analytical results from this field investigation will be documented in reports.

12.1 Documentation

The FTL will be responsible for controlling and maintaining all field documents and records, and for verifying that all required documents to be submitted to the INEEL SAM are maintained in good condition. All entries will be made in indelible black ink. Errors will be corrected by drawing a single line through the error, and entering the correct information. All corrections will be initialed and dated.

12.1.1 Sample Container Labels

Waterproof, gummed labels generated from the SAP database will display information such as the unique sample identification number, the name of the project, sample location, and analysis type. Labels will be completed and placed on the containers in the field before collecting the sample. Sample team members will provide information necessary for label completion. Such information may include sample date, time, preservative used, field measurements of hazards, and the sampler's initials.

12.1.2 Field Guidance Form

Field guidance forms, provided for each sample location, will be generated from the SAP database, to ensure unique sample numbers. These forms are used to facilitate sample container documentation and organization of field activities, and contain information regarding the following:

- Media
- Sample ID numbers
- Sample location
- Aliquot ID
- Analysis type
- Container size and type
- Sample preservation.

12.1.3 Field Logbooks

In accordance with INEEL SAM format, field logbooks will be used to record information necessary to interpret the analytical data. All field logbooks will be controlled and managed to assure the integrity of the record in accordance with Section XX of the FFA/CO.

12.1.3.1 Sample/Shipping Logbook. Sample logbooks will be used by the field teams. Each sample logbook will contain information such as:

- Physical measurements (if applicable)

- All quality control samples
- Shipping information (e.g., collection dates, shipping dates, cooler ID number, destination, chain-of-custody number, name of shipper)
- All team activities
- Problems encountered
- Visitor log
- List of site contacts.

This logbook will be signed and dated at the end of each day's sampling activities.

12.1.3.2 Field Instruments Calibration/Standardization Logbook. A logbook containing records of calibration data will be maintained for each piece of equipment requiring periodic calibration or standardization. This logbook will contain logsheets to record the date, time, method of calibration, and instrument ID number.

12.1.3.3 Field Team Leader's Daily Logbook. A project logbook maintained by the FTL will contain a daily summary of the following:

- All field team activities
- Visitor log
- List of site contacts
- Problems encountered
- Any corrective actions taken as a result of field audits.

This logbook will be signed and dated at the end of each day's sampling activities.

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Appendix A

INTEC Area Aquifer Well Construction Summary

Table A-1. The INTEC area aquifer well construction summary.

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
CPP-1	1950	296675	696666	4913	586	0.0	585.5	20.0	459.90	485.90	16.0	P	No log in anderson database
									527.40	576.80	16.0	P	
CPP-2	1951	296166	696665	4915	605	0.0	605.3	24.0	458.30	483.30	16.0	P	TOS in I(2) flow, BOS in K(1) flow
									551.10	600.25	16.0	P	HI interbed 350 to 361 ft
CPP-3	1950	296569	694813	4914	598	0.0	598.0	24.0	412.00	452.00	16.0	P	TOS in DE(7) flow, BOS in I(2) flow
									417.00	422.00	10.0	P	HI interbed 519 to 526 ft
									430.00	NF	12.0	P	
									445.00	588.00	10.0	P	
									490.00	593.00	16.0	P	
CPP-4	1983	297948	697487	4907	700	0.0	50.0	30.0	450.00	700.00	12.0	P	TOS in E(1) flow, BOS in J(1) flow
						50.0	130.0	24.0					HI interbed not present???
						130.0	450.0	20.0					
						450.0	700.0	16.0					
ICPP-MON-A-021	1995	298848	697457	4904	486	0.0	22.0	22.0	450.50	480.50	5.0	SLS	
						22.0	27.5	17.5					
						27.5	485.5	9.8					
ICPP-MON-A-022	1995	298828	695336	4907	585	0.0	510.0		490.00	510.00	5.0	SLS	

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
LF2-08	1988	294362	682879	4932	526	0.0	526.0	12.0	483.50	495.00	6.0	SL S	TOS in E(1) flow, BOS in E(1) flow
													HI interbed not encountered
LF2-09	1988	294198	682901	4932	676	0.0	676.0	10.0	469.60	497.00	4.0	SL S	TOS in DE8(1) flow, BOS in E(1) flow
													H interbed encountered 625 to 639 (TD)
LF2-10	1988	294274	682831	4932	816	0.0	627.0	12.0	725.00	735.00	6.0	P	TOS in I(1) flow, BOS in I(2) flow
									735.00	745.00	6.0	P	Interbeds: H(1) 620 to 641, HI(1) 641 to 669,
						627.0	820.0	8.0	755.00	765.00	6.0	WW	IJ(1) interbed 803 to 810
LF2-11	1989	295463	684292	4928	511	0.0	510.9	10.0	466.00	499.00	4.0	SL S	TOS in DE8(1) flow, BOS in DE8(1) flow
													HI interbed not encountered
LF2-12	1990	294022	682926	4933	517				470.00	492.00			TOS in DE8(1) flow, BOS in DE8(1) flow
													HI interbed not encountered
LF3-08	1988	291544	683112	4940	525	0.0	525.0	12.0	500.00	510.00	6.0	SL S	TOS in E(1) flow, BOS in E(1) flow
													HI interbed not encountered
LF3-09	1990	291518	682825	4941	517				480.00	500.00			TOS in DE8(1) flow, BOS in DE8(1) flow

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
													HI interbed not encountered
LF3-10	1990	290880	683530	4943	530				481.00	501.00			TOS in DE8(1) flow, BOS in DE8(1) flow
													HI interbed not encountered
LF3-11	1990	292687	686244	4934	532				472.20	492.20			TOS in DE8(1) flow, BOS in DE8(1) flow
													HI interbed not encountered
USGS-20	1951	301229	686527	4916		0.0	404.0	12.0	471.17	480.98	6.3	P	WL in E(1) flow
					676	404.0	676.0	8.0	511.82	552.73	6.3	P	TOS in E(1) flow, BOS in F(1) flow
													H(1) and HI(1) interbeds 611 to 676
USGS-34	1954	292739	690799	4930	700	0.0	363.0	16.0	499.00	700.00	8.0	OH	WL in E(1) flow
						363.0	499.0	13.0					TOS in E(1) flow, BOS in J(1) flow
						499.0	700.0	10.0					Interbeds:GH(1) 580 to 584, HI(1) 593 to 597
USGS-35	1955	292495	691251	4930	578.5	0.0	39.0	>12	142.50	578.50	7.0	OH	WL in E(1) flow
						39.0	144.5	10.0					TOS in D(1) flow, BOS in H(1) flow
						144.5	578.5	7.0					Interbeds not encountered below WL
USGS-36	1955	292977	690358	4930	567.1	0.0	37.0	12.0	431.70	567.10	6.0	OH	WL in E(1) flow

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
						37.0	394.7	8.0					TOS in DE8(1) flow, BOS in G(1) flow
						394.7	567.1	6.0					Interbeds not encountered below WL
USGS-37	1955	293222	689920	4930	573	0.0	41.5	12.0	507.00	571.50	6.0	OH	WL in E(1) flow
						41.5	197.0	10.0					TOS in EF(1) flow, BOS in G(1) flow
						197.0	507.0	8.0					Interbeds not encountered below WL
						507.0	573.0	6.0					
USGS-38	1955	293575	689567	4930	729	0.0	26.0	12.0	678.00	729.00	4.0	OH	WL in E(1) flow
						26.0	156.0	10.0					TOS in I(2) flow, BOS in J(1) flow
						156.0	505.0	8.0					Interbeds: HI(1) 596 to 601, IJ(1) 700 to 705
						505.0	729.0	6.0					
USGS-39	1955	292258	691691	4933	572	0.0	48.0	12.0	46.60	571.89	varies	OH	WL in E(1) flow
						48.0	152.0	10.0					TOS in B(1) flow, BOS in HI(1) interbed
						152.0	507.0	8.0					Interbeds: HI(1) 568 to 572
						507.0	572.0	6.0					
USGS-40	1956	295936	694539	4916	678.8	0.0	220.0	11.5	456.17	678.80	4.0	P	WL in EF(1) flow
						220.0	447.0	8.0					TOS in E(1) flow, BOS in I(2) flow

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
						447.0	678.8	6.0					Interbeds: HI(1) 527 to 527
USGS-41	1956	295936	694138	4917	674.4	0.0	428.1	8.0	428.09	674.40	6.0	OH	WL in EF(1) flow
						428.1	674.4	6.0					TOS in DE8(1) flow, BOS in J(1) flow
													Interbeds: HI(1) 530 to 534
USGS-42	1957	295936	693637	4918	678.45	0.0	34.0	12.0	452.52	678.45	6.0	OH	WL in EF(1) flow
						34.0	452.5	10.0					TOS in EF(1) flow, BOS in J(1) flow
						452.5	678.5	6.0					Interbeds: none encountered below WL
USGS-43	1957	295720	694857	4916	675.8	0.0	54.0	12.0	450.54	675.80	6.0	OH	WL in F(1) flow
						54.0	450.5	10.0					TOS in E(1) flow, BOS in J(1) flow
						450.5	675.8	6.0					Interbeds: HI(1) 516 to 520
USGS-44	1957	295248	694242	4919	650	0.0	35.0	12.0	461.00	650.00	6.0	OH	WL in E(1) flow
						35.0	385.0	10.0					TOS in EF(1) flow, BOS in I(2) flow
						385.0	461.0	8.0					Interbeds: none encountered below WL, also
						461.0	650.0	6.0					Note H flow not encountered this borehole
USGS-45	1957	295490	693598	4920	651.21	0.0	53.0	12.0	461.00	651.51	6.0	OH	WL in EF(1) flow

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
						53.0	133.0	10.0					TOS in E(1) flow, BOS in I(2) flow
						133.0	461.0	8.0					Interbeds: HI(1) 541 to 550
						461.0	651.2	6.0					
USGS-46	1958	295722	694023	4917	650.86	0.0	45.0	12.0	461.33	650.86	6.0	OH	WL in E(1) flow
						45.0	268.0	10.0					TOS in E(1) flow, BOS in I(2) flow
						268.0	461.3	8.0					Interbeds: HI(1) 542 to 548
						461.3	650.9	6.0					
USGS-47	1958	296572	694110	4916	651.3	0.0	41.0	12.0	458.14	651.30	6.0	OH	WL in E(1) flow
						41.0	460.0	8.0					TOS in E(1) flow, BOS in I(2) flow
						460.0	651.3	6.0					Interbeds: HI(1) 532 to 537
USGS-48	1958	296612	693414	4917	750	0.0	32.0	12.0	462.10	750.00	6.0	OH	WL in E(1) flow
						32.0	462.1	8.0					TOS in E(1) flow, BOS in K(1) interbed
						462.1	750.0	6.0					Interbeds: HI(1) 549 to 552, K(1) 739 to TD
USGS-49	1960	297232	693640	4913	656	0.0	129.0	16.0	458.29	656.00	6.0	OH	WL in DE8(1) flow
						129.0	458.0	8.0					TOS in DE8(1) flow, BOS in I(2) flow
						458.0	656.0	6.0					Interbeds: HI(1) 540 to 542

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
USGS-51	1960	296348	692343	4918	659	0.0	68.0	12.0	475.20	659.00	6.0	OH	WL in E(1) flow
						68.0	475.2	8.0					TOS in E(1) flow, BOS in I(2) flow
						475.2	659.0	6.0					Interbeds: HI(1) 561 to 565
USGS-52	1959	297968	694831	4910	650	0.0	248.0	16.0	450.00	650.00	6.0	OH	WL in DE7(1) flow
						248.0	264.0	12.0					TOS in DE6(1) flow, BOS in I(2) flow
						264.0	450.0	10.0					Interbeds: HI(1) 526 to 531
						450.0	650.0	6.0					
USGS-57	1960	294867	691752	4923	732	0.0	52.0	12.0	477.00	732.00	6.0	OH	WL in E(1) flow
						52.0	465.0	10.0					TOS in E(1) flow, BOS in J(1) flow
						465.0	732.0	6.0					Interbeds: HI(1) 567 to 572
USGS-59	1960	297685	692760	4915	657	0.0	49.0	12.0	464.00	657.00	6.0	OH	WL in E(1) flow
						49.0	291.0	10.0					TOS in E(1) flow, BOS in I(2) flow
						291.0	464.0	8.0					Interbeds: HI(1) 554 to 558
						464.0	657.0	6.0					
USGS-67	1960	298201	691726	4916	694	0.0	40.0	12.0	465.00	552.00	6.0	OH	WL in DE8(1) flow
						40.0	465.0	10.0	635.00	694.00	4.0	OH	TOS in DE8(1) flow, BOS in I(2) flow
						465.0	635.0	6.0					Interbeds: HI(1) flow 572 to 590
						635.0	694.0	4.0					

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
USGS-77	1962	296490	688820	4923	610	0.0	126.0	12.0	470.00	610.00	6.0	OH	WL in EF(1) flow
						126.0	470.0	10.0					TOS in EF(1) flow, BOS in F(1) flow
						470.0	610.0	6.0					Interbeds: none encountered below WL
USGS-82	1962	300453	693410	4908	700	0.0	460.0	12.0	469.00	561.00	6.6	P	WL in DE6(1) flow
						460.0	593.0	8.0	593.00	700.00	6.0	OH	TOS in DE6(1) flow, BOS in J(1) flow
						593.0	700.0	6.0					Interbeds: HI(1) 557 to 566
USGS-84	1962	289284	693066	4939	505	0.0	84.0	12.0	324.00	505.00	6.0	OH	WL in FG(1) flow
						84.0	324.0	10.0					TOS in DE6(1) flow, BOS in G(1) flow
						324.0	505.0	6.0					Interbeds: none encountered below WL
USGS-85	1962	291434	685922	4940	637	0.0	68.0	12.0	522.00	637.00	6.0	OH	WL in E(1) flow
						68.0	522.0	10.0					TOS in E(2) flow, BOS in HI(1) interbed
						522.0	637.0	6.0					Interbeds: H(1) 611 to 631, HI(1) 631 to TD
USGS-111	1984	296386	690432	4920	595	0.0	440.0	10.0	430.00	440.00	8.0	P	WL in DE8(1) flow
						440.0	595.0	8.0	440.00	600.00	8.0	OH	TOS in DE7-8(1), BOS in F(1) flow
													Interbeds: none encountered below WL

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
USGS-112	1984	294488	688763	4927	563	0.0	432.0	10.0	432.00	563.00	8.0	OH	WL in E(1) flow
						432.0	563.0	8.0					TOS in DE8(1) flow, BOS in F(1) flow
													Interbeds: none encountered below WL
USGS-113	1984	295405	688758	4925	564	0.0	445.0	8.0	445.00	564.00	6.0	OH	WL in E(1) flow
						445.0	564.0	6.0					TOS in DE8(1) flow, BOS in F(1) flow
													Interbeds: none encountered below WL
USGS-114	1984	297438	689178	4920	562.5	0.0	440.0	8.0	440.00	562.00	6.0	OH	WL in E(1) flow
						440.0	562.5	6.0					TOS in DE7(1) flow, BOS in F(1) flow
													Interbeds: none encountered below WL
USGS-115	1984	298129	689307	4919	581	0.0	440.0	8.0	440.00	581.00	6.0	OH	WL in E(1) flow
						440.0	581.0	6.0					TOS in DE7(1) flow, BOS in FG(1) flow
													Interbeds: none encountered below WL
USGS-116	1984	298782	690449	4916	580	0.0	400.0	8.0	400.00	580.00	6.0	OH	WL in E(1) flow
						400.0	580.0	6.0					TOS in DE7-8(1) interbed, BOS in G(1) flow

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
													Interbeds: none encountered below WL
USGS-121	1990	296599	698362	4910	745.8	0.0	39.2	16.0	449.00	475.00	6.0	SL S	WL in EF(1) flow
						39.2	444.0	11.9					TOS in E(1) flow, BOS in EF(1) flow
						444.0	495.2	7.9					Interbeds: HI(1) 517 to 522, K(1) 734 to TD
						495.2	533.0	3.7					
						533.0	745.0	3.0					
USGS-122	1990	297423	692680	4915	482.8	0.0	30.0	16.0	448.00	475.00	3.0	SL S	WL in DE8(1) flow
						30.0	287.0	11.9					TOS in DE8(1) flow, BOS in E(1) flow
						287.0	444.0	7.9					Interbeds: DE9(1) 466 to 471
						444.0	482.8	3.9					
USGS-123	1990	295776	692519	4920	744.2	0.0	40.0	16.0	449.50	475.30	6.0	SL S	WL in EF(1) flow
						40.0	442.0	11.9					TOS in EF(1) flow, BOS in FG(1) flow
						442.0	503.0	7.9					Interbeds: HI(1) 559 to 563, IJ(1) 684 to 689
						503.0	744.2	3.7					K(1) 736 to TD
CPP-A44	1973	296983	695698	4915	40	0.0	40.0	8.0	29.60	39.60	2.0	p	
CPP-A50	1973	296767	695682	4919	33	0.0	33.0	8.0	20.50	30.50	2.0	p	

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
CPP-A56		296911	695517	4919	~41	0.0	41.0	8.0	30.00	40.00	2.0	p	
CPP-33-1	1991	296951	695394		29.5	0.0	29.5	6.3					
CPP-33-2	1990	296638	695385		114.8	0.0	43.2	10.5					
						43.2	114.5	6.3	85.80	105.80	2.0	SLS	
CPP-33-3	1990	296659	695806		126.4	0.0	45.8	10.5	111.80	122.00	2.0	SLS	
						45.8	125.2	6.3					
						125.2	126.4	3.8					
CPP-33-4-1	1990	297010	696045		124	0.0	123.0	9.0	98.20	118.50	2.0	SLS	
						123.0	124.0	3.3					
CPP-33-4-2	1990	297000	696045		34.3	0.0	34.3	9.0	20.50	30.70	2.0	SLS	
CPP-55-06	1990	297561	695055	4912	122.9	0.0	43.9	8.0	93.10	113.10	2.0	SLS	
						43.9	122.9	5.3					
MW-1	1993	296097	694730		395	0.0	50.0	24.0	325	336	4.0	sl-pvc	
						50.0	165.0	11.9	359	369	4.0	sl-pvc	
						165.0	395.0	7.9					
MW-2	1993	297262	695285		127	0.0	50.0	10.5	102	112	2.0	pvc	
						50.0	127.0	5.6					
MW-3	1993	296396	695215		151.3	0.0	58.0	10.5	125.5	138.5	2.0	SLS	

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
						58.0	151.3	5.6					
MW-4	1993	297827	695375		131	0.0	44.0	10.5	100.6	110.6	2.0	pvc	
						44.0	131.0	5.6					
MW-5	1993	297063	695109		141	0.0	48.0	10.5	106.5	126.5	2.0	SLS	
						48.0	141.0	5.6					
MW-6	1993	296320	695690		161	0.0	53.0	10.5	117	137	2.0	pvc	
						53.0	161.0	5.6					
MW-7	1993	296726	693208		177	0.0	35.0	10.5	132	142	2.0	pvc	
						35.0	177.0	5.6					
MW-8	1993	297514	694805		141	0.0	46.0	10.5	115	125	2.0	pvc	
						46.0	141.0	5.6					
MW-9	1993	296357	693168		159	0.0	35.0	10.5	120	130	2.0	pvc	
						35.0	159.0	5.6					
MW-10	1993	297077	695355		181	0.0	141.0	10.5	141	151	2.0	pvc	
						141.0	181.0	5.6					
MW-11	1993	296853	694434		150.5	0.0	47.0	10.5	131	136	2.0	pvc	
						47.0	150.5	5.6					
MW-12	1994	297333	695106		153	0.0	46.0	10.5	108	118	2.0	pvc	
						46.0	153.0	5.6					
MW-13	1994	296561	693106		128	0.0	34.0	10.5	100	105	2.0	pvc	
						34.0	128.0	5.6					
MW-14	1994	296503	693594		138	0.0	30.5	10.5	94	104	2.0	pvc	
						30.5	138.0	5.6					

Table A-1. (continued).

INEEL Name	Year Installed	Monument Location Easting (ft)	Northing (ft)	Elevation (ft)	Total Depth (ft)	Borehole Diameter Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Information Depth to Top (ft)	Depth to Bottom (ft)	Diameter (in.)	Screen Type	Notes On Aquifer Stratigraphy
MW-15	1994	296608	693060		143	0.0	34.0	10.5	111.3	131.3	2.0	pvc	
						34.0	143.0	5.6					
MW-16	1994	296649	693173		126	0.0	33.0	10.5	97	107	2.0	pvc	
						33.0	126.0	5.6					
MW-17	1994				381	0.0	32.0	24.0	263.8	273.8	2.0	pvc	
						32.0	210.0	11.9					
						210.0	377.5	7.9					
						377.5	381.0	4.0					
MW-18	1994				492	0.0	46.4	24.0	458.5	478.5	2.0	pvc	
						46.4	136.0	11.9					
						138.0	492.0	7.9					
MW-20	1994				151.5	0.0	46.5	10.5	133.2	143.2	2.0	pvc	
						46.5	151.5	5.6	143.2	148.4	2.0	SLS	
PW-1	1986	296234	692270	4917	120	0.0	32.0	12.0	100	120	6.0	p	
						33.0	120.0	10.0					
PW-2	1986	297010	691791	4917	131	0.0	21.0	12.0	111	131	6.0	p	
						21.0	131.0	10.0					
PW-3	1986	296961	692447	4916	125	0.0	29.0	12.0	103	123	6.0	p	
						29.0	125.0	10.0					
PW-4	1986	297572	692197	4914	150	0.0	33.0	12.0	110	150	6.0	p	
						33.0	150.0	10.0					
PW-5	1986	296987	692196	4916	131	0.0	30.0	12.0	109	129	6.0	p	
						30.0	131.0	10.0					
PW-6	1986	295150	692696	4920	135	0.0	38.0	12.0			6.0	p	
						38.0	135.0	10.0					

Appendix B

Sampling and Analysis Plan Table

Plan Table Number: WAG3GROUP5(MICR
SAP Number:
Date: 07/20/00   Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LOW-TERM MONITIORING MICROPURGE SMPLG 11/22/00 Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
5OM201	REG	GROUND WATER	GRAB		11/22/00	INTEC	ICPP-MON-A021	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM202	REG	GROUND WATER	GRAB		11/22/00	INTEC	ICPP-MON-A022	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM203	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-20	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM204	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-34	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM205	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-35	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM206	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-36	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM207	REG/QC	GROUND WATER	DUP		11/22/00	INTEC	USGS-37	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
5OM208	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-38	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM209	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-39	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM210	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM211	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-41	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM212	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM213	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-43	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM214	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-44	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM215	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-45	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Anions
AT4: CLP Metals
AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(MICR
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LOW-TERM MONITORING MICROPURGE SMPLG 11/22/00 Project Manager: C.J. ROBERTS

SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1 A4	AT2 AB	AT3 AN	AT4 C1	AT5 EA	AT6 HG	AT7 NP	AT8 PY	AT9 R4	AT10 R8	AT11 RB	AT12 RF	AT13 RI	AT14 UA	AT15	AT16	AT17	AT18	AT19	AT20
5OM216	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-46	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM217	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM218	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM219	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM220	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM221	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM222	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM223	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-59	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM224	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM225	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-77	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM226	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-82	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM227	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-84	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM228	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM229	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-111	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM230	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Anions
AT4: CLP Metals
AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(MICR
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LOW-TERM MONITIORING MICROPURGE SMPLG 11/22/00 Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
50M231	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M232	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-114	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M233	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-115	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M234	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-116	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M235	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M236	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M237	REG	GROUND WATER	GRAB		11/22/00	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M238	REG/QC	GROUND WATER	DUP		11/22/00	INTEC	LF3-8	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
50M239	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF3-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M240	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF3-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M241	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF3-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M242	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF2-8	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M243	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF2-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M244	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF2-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M245	REG	GROUND WATER	GRAB		11/22/00	INTEC	LF2-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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AT4: CLP Metals
AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

C O M M E N T S

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(MICR
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LON-TERM MONITIORING MICROPURGE SMPLG 11/22/00 Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
50M246	REG/QC	GROUND WATER	DUP		11/22/00	INTEC	LF2-12	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
50M247	REG	GROUND WATER	GRAB		11/22/00	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M248	QC	GROUND WATER	RNST		11/22/00	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LONG-TERM MONITORING BASELINE SMPLING 10/11/00 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
5OM001	REG	GROUND WATER	GRAB		10/11/00	INTEC	ICPP-MON-A021	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM002	REG	GROUND WATER	GRAB		10/11/00	INTEC	ICPP-MON-A022	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM003	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-20	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM004	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-34	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM005	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-35	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM006	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-36	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM007	REG/QC	GROUND WATER	DUP		10/11/00	INTEC	USGS-37	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
5OM008	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-38	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM009	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-39	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM010	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM011	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-41	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM012	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM013	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-43	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM014	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-44	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM015	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-45	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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AT1: Am-241
AT2: Gross Alpha/Beta
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AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma Spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LONG-TERM MONITORING BASELINE SMPLING 10/11/00 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A6	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
5OM016	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-46	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM017	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM018	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM019	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM020	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM021	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM022	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM023	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-59	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM024	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM025	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-77	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM026	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-82	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM027	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-84	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM028	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM029	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-111	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
5OM030	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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AT1: Am-241
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AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma Spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(R01)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LONG-TERM MONITORING BASELINE SMPLING 10/11/00 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA						
50M031	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M032	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-114	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M033	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-115	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M034	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-116	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M035	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M036	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M037	REG	GROUND WATER	GRAB		10/11/00	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M038	REG/QC	GROUND WATER	DUP		10/11/00	INTEC	LF3-8	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
50M039	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF3-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M040	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF3-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M041	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF3-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M042	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF2-8	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M043	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF2-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M044	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF2-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M045	REG	GROUND WATER	GRAB		10/11/00	INTEC	LF2-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma Spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 LONG-TERM MONITORING BASELINE SMPLING 10/11/00 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
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SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	AN	C1	EA	HG	NP	PY	R4	R8	R8	RF	RI	UA						
50M046	REG/QC	GROUND WATER	DUP		10/11/00	INTEC	LF2-12	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
50M047	REG	GROUND WATER	GRAB		10/11/00	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
50M048	QC	WATER	RNST		10/11/00	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Anions
AT4: CLP Metals
AT5: Tc-99
AT6: Mercury
AT7: Np-237
AT8: Pu-241
AT9: Gamma Spectroscopy
AT10: Tritium

AT11: Strontium-90
AT12: Pu Isotopes
AT13: Iodine-129
AT14: Uranium Isotopes
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240
Isotopic U is defined as U-234, U-235 and U-238
Gamma Spectrometry analysis isotope of concern Cs-137

Plan Table Number: WAG3GROUP5(RD2)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.00

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE-ROUND 2 (SEMIANN) Project Manager: C. J. ROBERTS

SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM050	REG/QC	GROUND WATER	DUP		05/25/01	INTEC	MW-18	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM051	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM052	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM053	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM054	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM055	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM056	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM057	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM058	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM059	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM060	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM061	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM062	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM063	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM064	REG	GROUND WATER	GRAB		05/25/01	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Samples 5OM061, 5OM062 and 5OM063 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma spectrometry analysis isotope of concern Cs-137.

Plan Table Number: WAG3GROUP5(R02)
SAP Number:
Date: 07/20/00   Plan Table Revision: 1.00

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE-ROUND 2 (SEMIANN)   Project Manager: C. J. ROBERTS   SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M065	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M066	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M067	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M068	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M069	REG	GROUND WATER	GRAB		05/25/01	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M250	QC	WATER	RNST		05/25/01	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Samples 50M061, 50M062 and 50M063 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma spectrometry analysis isotope of concern Cs-137.

Plan Table Number: WAG3GROUP5(RD3)
SAP Number:
Date: 07/20/00 Plan Table Revision: 1.00

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 3 (ANNUAL) Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M085	REG	GROUND WATER	GRAB		05/22/02	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M086	REG	GROUND WATER	GRAB		05/22/02	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M087	REG	GROUND WATER	GRAB		05/22/02	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M088	REG	GROUND WATER	GRAB		05/22/02	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M089	REG	GROUND WATER	GRAB		05/22/02	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M251	QC	WATER	RNST		05/22/02	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Samples 50M081, 50M082 and 50M083 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.

Isotopic U is defiend as U-234, U-235 and U-238.

Gamma Spectrometry analysis isotope of interest Cs-137.

Plan Table Number: WAG3GROUP5(RD4)

SAP Number:

Date: 01/22/2002 Plan Table Revision: 3.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 4 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	A4	R4	AB	RI	HG	NPPY		R7	R8	EA	R6	R9								
5OM090	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	MW-18	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM091	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-40	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM092	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-42	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM093	REG/QC	GROUND WATER	DUP		05/20/03	INTEC	MONITORING WELL	USGS-47	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM094	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-48	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM095	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-49	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM096	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-51	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM097	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-52	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM098	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-121	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM099	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-122	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM100	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-123	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM101	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-41	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM102	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-48	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM103	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-59	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM104	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	LF3-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number. The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-Iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:

NOTE: Samples 5OM101, 5OM102 and 5OM103 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Plan Table Number: WAG3GROUP5(RD4)

SAP Number:

Date: 01/22/2002 Plan Table Revision: 3.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 4 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	A4	R4	AB	RI	HG	NPPY		R7	RB	EA	R8	R9								
5OM105	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-57	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM106	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-67	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM107	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-112	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM108	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	USGS-85	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM109	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	LF2-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM110	REG	GROUND WATER	GRAB		05/20/03	INTEC	MONITORING WELL	ICPP-MON-A-230	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM111	QC	WATER	RNST		05/20/03	INTEC	EQUIPMNT RINSTE	QC	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number. The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:
NOTE: Samples 5OM101, 5OM102 and 5OM103 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Plan Table Number: WAG3GROUP5(RD5)

SAP Number:

Date: 01/22/2003 Plan Table Revision: 2.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 5 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	R4	AB	RI	HG	NPPY		R7	RB	EA	R8	R9								
5OM260	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	MW-18	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM261	REG/QC	GROUND WATER	DUP		06/01/04	INTEC	MONITORING WELL	USGS-40	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM262	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-42	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM263	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-47	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM264	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-48	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM265	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-49	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM266	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-51	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM267	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-52	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM268	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-121	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM269	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-122	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM270	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-123	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM271	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-41	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM272	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-48	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM273	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-59	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM274	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	LF3-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number. The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-Iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:
NOTE: Samples 5OM271, 5OM272, and 5OM273 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.
Isotopic U is defined as U-234, U-235 and U238.
Gamma spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Plan Table Number: WAG3GROUP5(RD5)

SAP Number:

Date: 01/22/2003 Plan Table Revision: 2.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 5 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	R4	AB	RI	HG	NPPY		R7	RB	EA	R8	R9								
5OM275	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-57	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM276	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-67	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM277	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-112	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM278	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	USGS-85	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM279	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	LF2-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM280	REG	GROUND WATER	GRAB		06/01/04	INTEC	MONITORING WELL	ICPP-MON-A-230	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM281	QC	WATER	RNST		06/01/04	INTEC	EQUIPMNT RINSTE	QC	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.

The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-Iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:

NOTE: Samples 5OM271, 5OM272, and 5OM273 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.

Isotopic U is defined as U-234, U-235 and U238.

Gamma spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Plan Table Number: WAG3GROUP5(RD6)

SAP Number:

Date: 01/22/2003 Plan Table Revision: 2.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 6 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	A4	R4	AB	RI	HG	NPPY		R7	RB	EA	R8	R9								
5OM300	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-18	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM301	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-40	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM302	REG/QC	GROUND WATER	DUP		05/20/05	INTEC	MONITORING WELL	MW-42	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM303	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-47	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM304	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-48	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM305	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-49	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM306	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-51	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM307	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-52	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM308	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-121	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM309	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-122	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM310	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	MW-123	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM311	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-41	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM312	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-48	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM313	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-59	NOTE	1	1	1	1	1	1	1	1	1	1	1	1								
5OM314	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	LF3-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number. The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-Iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:

NOTE: Samples 5OM311, 5OM312, and 5OM313 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma Spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Sampling and Analysis Plan Table for Chemical and Radiological Analysis

Plan Table Number: WAG3GROUP5(RD6)

SAP Number:

Date: 01/22/2003 Plan Table Revision: 2.0 Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 6 (ANNUAL) Project Manager: FORSYTHE, H. S. SMO Contact: KIRCHNER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	R4	AB	RI	HG	NPPY		R7	RB	EA	R8	R9								
5OM315	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-57	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM316	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-67	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM317	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-112	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM318	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-113	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM319	REG	GROUND WATER	GRAB		05/20/05	INTEC	MONITORING WELL	USGS-85	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM320	REG	GROUND WATER	GRAB		05/02/05	INTEC	MONITORING WELL	LF2-08	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM321	REG	GROUND WATER	GRAB		05/02/05	INTEC	MONITORING WELL	ICPP-MON-A-230	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM322	QC	GROUND WATER	RNST		05/20/05	INTEC	EQUIPMNT RINSTE	QC	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number. The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gamma Spec
AT3: Gross Alpha/Beta
AT4: Iodine-129
AT5: Mercury
AT6: Np-237
AT7: Pu-241
AT8: Pu-Iso
AT9: Sr-90
AT10: Tc-99

AT11: Tritium
AT12: U-Iso
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:

NOTE: Samples 5OM311, 5OM312, and 5OM313 shall be taken from a depth below the HI interbed.

Isotopic Pu is defined as Pu-238, Pu-239, and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma Spectrometry analysis isotope of concern Cs-137.

Analysis Suites:

Contingencies:

Plan Table Number: WAG3GROUP5(RD7)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG3 GROUP 5 OPERATION AND MAINTENANCE-ROUND 7 (ANNUAL) Project Manager: C.J. ROBERTS SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM350	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM351	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM352	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM353	REG/QC	GROUND WATER	DUP		06/01/06	INTEC	MW-47	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM354	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM355	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM356	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM357	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM358	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM359	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM360	REG	GROUND WATER	GRAB		06/01/06	INTEC	MW-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM361	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM362	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM363	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM364	REG	GROUND WATER	GRAB		06/01/06	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 5OM361, 5OM362 and 5OM363 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD7)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG3 GROUP 5 OPERATION AND MAINTENANCE-ROUND 7 (ANNUAL) Project Manager: C.J. ROBERTS SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM365	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM366	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM367	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM368	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM369	REG	GROUND WATER	GRAB		06/01/06	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM370	QC	WATER	RNST		06/01/06	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma Spectrometry analysis isotope of concern Cs-137.

Samples 5OM361, 5OM362 and 5OM363 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD8)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 8 (ANNUAL) Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M400	REG	GROUND WATER	GRAB		06/01/07	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M401	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M402	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M403	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M404	REG/QC	GROUND WATER	DUP		06/01/07	INTEC	USGS-48	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
50M405	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M406	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M407	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M408	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M409	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M410	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M411	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M412	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M413	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M414	REG	GROUND WATER	GRAB		06/01/07	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 50M411, 50M412 and 50M413 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD8)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 8 (ANNUAL) Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM415	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM416	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM417	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM418	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM419	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM420	QC	WATER	RNST		06/01/07	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 5OM411, 5OM412 and 5OM413 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD8)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 8 (ANNUAL) Project Manager: C.J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM415	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM416	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM417	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM418	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM419	REG	GROUND WATER	GRAB		06/01/07	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM420	QC	WATER	RNST		06/01/07	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 5OM411, 5OM412 and 5OM413 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD9)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 9 (BIANNUAL) Project Manager: C.J. ROBERTS

SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	PY	R4	R8	R8	RF	RI	UA								
5OM450	REG	GROUND WATER	GRAB		06/01/09	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM451	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM452	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM453	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM454	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM455	REG/QC	GROUND WATER	DUP		06/01/09	INTEC	USGS-49	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM456	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM457	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM458	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM459	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM460	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM461	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM462	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM463	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM464	REG	GROUND WATER	GRAB		06/01/09	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 5OM461, 5OM462 and 5OM463 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD9)
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 9 (BIANNUAL) Project Manager: C.J. ROBERTS

SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M465	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M466	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M467	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M468	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M469	REG	GROUND WATER	GRAB		06/01/09	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M470	QC	WATER	RNST		06/01/09	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241	AT11: Iodine-129	**COMMENTS**
AT2: Gross Alpha/Beta	AT12: Uranium Isotopes	Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
AT3: Tc-99	AT13:	Isotopic U is defined as U-234, U-235 and U-238.
AT4: Mercury	AT14:	Gamma Spectrometry analysis isotope of concern Cs-137.
AT5: Np-237	AT15:	Samples 50M461, 50M462 and 50M463 shall be taken from a depth below the HI
AT6: Pu-241	AT16:	interbed.
AT7: Gamma Spectroscopy	AT17:	
AT8: Tritium	AT18:	
AT9: Strontium-90	AT19:	
T10: Pu Isotopes	AT20:	

Plan Table Number: WAG3GROUP5(RD10
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 10 (BIANNUAL Project Manager: C.J. ROBERTS SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M500	REG	GROUND WATER	GRAB		06/01/11	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M501	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M502	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M503	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M504	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M505	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M506	REG/QC	GROUND WATER	DUP		06/01/11	INTEC	USGS-51	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
50M507	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M508	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M509	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M510	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M511	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M512	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M513	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M514	REG	GROUND WATER	GRAB		06/01/11	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 50M511, 50M512 and 50M513 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD10
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 10 (BIANNUAL Project Manager: C.J. ROBERTS

SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM515	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM516	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM517	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM518	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM519	REG	GROUND WATER	GRAB		06/01/11	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM520	QC	WATER	RNST		06/01/11	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma Spectrometry analysis isotope of concern Cs-137.
Samples 5OM511, 5OM512 and 5OM513 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD11
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 11 (BIANNUAL Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM550	REG	GROUND WATER	GRAB		06/01/13	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM551	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM552	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM553	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM554	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM555	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM556	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM557	REG/QC	GROUND WATER	DUP		06/01/13	INTEC	USGS-52	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM558	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM559	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM560	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM561	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM562	REG	GROUND WATER	GRAB		06/01/13	INTEC	5OM562	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM563	REG	GROUND WATER	GRAB		06/01/13	INTEC	5OM563	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM564	REG	GROUND WATER	GRAB		06/01/13	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.
Samples 5OM561, 5OM562 and 5OM563 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD11
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 11 (BIANNUAL Project Manager: C. J. ROBERTS

SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM565	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM566	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM567	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM568	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM569	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM570	QC	WATER	RNST		06/01/13	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.
Samples 5OM561, 5OM562 and 5OM563 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD11
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 11 (BIANNUAL Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED											
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1 A4	AT2 AB	AT3 EA	AT4 HG	AT5 NP	AT6 PY	AT7 R4	AT8 R8	AT9 RB	AT10 RF	AT11 RI	AT12 UA
5OM565	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1
5OM566	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1
5OM567	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1
5OM568	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1
5OM569	REG	GROUND WATER	GRAB		06/01/13	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1
5OM570	QC	WATER	RNST		06/01/13	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.
Samples 5OM561, 5OM562 and 5OM563 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD12
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 12 (BIANNUAL Project Manager: C.J. ROBERTS SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
5OM600	REG	GROUND WATER	GRAB		06/01/15	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM601	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM602	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM603	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM604	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM605	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM606	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM607	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM608	REG/QC	GROUND WATER	DUP		06/01/15	INTEC	USGS-121	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
5OM609	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM610	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
5OM611	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM612	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM613	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
5OM614	REG	GROUND WATER	GRAB		06/01/15	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes
AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.

Isotopic U is defined as U-234, U-235 and U-238.

Gamma spectrometry analysis isotope of interest Cs-137.

Samples 5OM611, 5OM612 and 5OM613 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD12
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 12 (BIANNUAL Project Manager: C.J. ROBERTS SMO Contact: J.D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M615	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M616	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M617	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M618	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M619	REG	GROUND WATER	GRAB		06/01/15	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M620	QC	WATER	RNST		06/01/15	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of interest Cs-137.
Samples 50M611, 50M612 and 50M613 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD13
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 13 (FIVE YR) Project Manager: C.J. ROBERTS SMO Contact: J.D.JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M650	REG	GROUND WATER	GRAB		06/01/20	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M651	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M652	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M653	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M654	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M655	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M656	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M657	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M658	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M659	REG/QC	GROUND WATER	DUP		06/01/20	INTEC	USGS-122	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2	2	2								
50M660	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M661	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-41	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M662	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-48	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M663	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-59	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1	1	1								
50M664	REG	GROUND WATER	GRAB		06/01/20	INTEC	LF3-08	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

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The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.
Samples 50M661, 50M662 and 50M663 shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD13
SAP Number:
Date: 07/20/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 13 (FIVE YR) Project Manager: C.J. ROBERTS SMO Contact: J.D.JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	PY	R4	R8	RB	RF	RI	UA								
50M665	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M666	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M667	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M668	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M669	REG	GROUND WATER	GRAB		06/01/20	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1	1	1								
50M670	QC	WATER	RNST		06/01/20	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1	1	1								

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Pu-241
AT7: Gamma Spectroscopy
AT8: Tritium
AT9: Strontium-90
AT10: Pu Isotopes

AT11: Iodine-129
AT12: Uranium Isotopes
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

Isotopic Pu is defined as Pu-238, Pu-239 and Pu-240.
Isotopic U is defined as U-234, U-235 and U-238.
Gamma spectrometry analysis isotope of concern Cs-137.
Samples 50M661, 50M662 and 50M663 shall be taken from a depth below the HI Interbed.

Plan Table Number: WAG3GROUP5(RD2)
SAP Number:
Date: 05/17/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 2 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
50M050	REG/QC	GROUND WATER	DUP		05/07/01	INTEC	MW-18	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2										
50M051	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M052	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M053	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M054	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M055	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M056	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M057	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M058	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M059	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M060	REG	GROUND WATER	GRAB		05/07/01	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M061	REG	GROUND WATER	GRAB		05/07/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M062	REG	GROUND WATER	GRAB		05/07/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M063	REG	GROUND WATER	GRAB		05/07/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M064	QC	WATER	RNST		05/07/01	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1										

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Tritium
AT7: Strontium-90
AT8: Pu Isotopes
AT9: Iodine-129
AT10: Uranium Isotopes

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

TBD well samples shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD3)
SAP Number:
Date: 05/18/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 3 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
50M070	REG	GROUND WATER	GRAB		11/05/01	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M071	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M072	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M073	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M074	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M075	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M076	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M077	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M078	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M079	REG	GROUND WATER	GRAB		11/05/01	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M080	REG/QC	GROUND WATER	DUP		11/05/01	INTEC	USGS-123	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2										
50M081	REG	GROUND WATER	GRAB		11/05/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M082	REG	GROUND WATER	GRAB		11/05/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M083	REG	GROUND WATER	GRAB		11/05/01	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M084	QC	WATER	RNST		11/05/01	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1										

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Tritium
AT7: Strontium-90
AT8: Pu Isotopes
AT9: Iodine-129
AT10: Uranium Isotopes

AT11:
AT12:
AT13:
AT14:
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COMMENTS

TBD well samples shall be taken from a depth below the HI interbed.

Plan Table Number: WAG3GROUP5(RD4)
SAP Number:
Date: 05/18/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 4 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
50M090	REG	GROUND WATER	GRAB		05/06/02	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M091	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M092	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M093	REG/QC	GROUND WATER	DUP		05/06/02	INTEC	USGS-47	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2										
50M094	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M095	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M096	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M097	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M098	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M099	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M100	REG	GROUND WATER	GRAB		05/06/02	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M101	REG	GROUND WATER	GRAB		05/06/02	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M102	REG	GROUND WATER	GRAB		05/06/02	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M103	REG	GROUND WATER	GRAB		05/06/02	INTEC	TBD	MONITORING WELL	COMMENT	1	1	1	1	1	1	1	1	1	1										
50M104	QC	WATER	RNST		05/06/02	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1										

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The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Tritium
AT7: Strontium-90
AT8: Pu Isotopes
AT9: Iodine-129
AT10: Uranium Isotopes

AT11:
AT12:
AT13:
AT14:
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AT16:
AT17:
AT18:
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AT20:

COMMENTS

TBD well samples shall be taken from a depth below the HI interbed

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 05/17/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 1 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1 A4	AT2 AB	AT3 EA	AT4 HG	AT5 NP	AT6 R8	AT7 RB	AT8 RF	AT9 RI	AT10 UA	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
50M001	REG	GROUND WATER	GRAB		11/06/00	INTEC	ICPP-MON-A021	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M002	REG	GROUND WATER	GRAB		11/06/00	INTEC	ICPP-MON-A022	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M003	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-20	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M004	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-34	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M005	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-35	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M006	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-36	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M007	REG/QC	GROUND WATER	DUP		11/06/00	INTEC	USGS-37	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2										
50M008	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-38	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M009	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-39	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M010	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-40	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M011	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-41	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M012	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-42	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M013	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-43	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M014	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-44	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M015	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-45	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										

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The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

		COMMENTS
AT1: Am-241	AT11:	
AT2: Gross Alpha/Beta	AT12:	
AT3: Tc-99	AT13:	
AT4: Mercury	AT14:	
AT5: Np-237	AT15:	
AT6: Tritium	AT16:	
AT7: Strontium-90	AT17:	
AT8: Pu Isotopes	AT18:	
AT9: Iodine-129	AT19:	
AT10: Uranium Isotopes	AT20:	

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 05/17/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 1 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
50M016	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-46	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M017	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-47	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M018	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-48	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M019	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-49	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M020	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-51	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M021	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-52	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M022	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-57	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M023	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-59	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M024	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-67	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M025	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-77	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M026	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-82	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M027	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-84	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M028	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-85	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M029	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-111	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M030	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-112	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										

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AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Tritium
AT7: Strontium-90
AT8: Pu Isotopes
AT9: Iodine-129
AT10: Uranium Isotopes

AT11:
AT12:
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AT20:

COMMENTS

Plan Table Number: WAG3GROUP5(RD1)
SAP Number:
Date: 05/17/00 Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 1 Project Manager: C. J. ROBERTS SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
5OM031	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-113	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM032	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-114	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM033	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-115	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM034	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-116	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM035	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-121	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM036	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-122	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM037	REG	GROUND WATER	GRAB		11/06/00	INTEC	USGS-123	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM038	REG/QC	GROUND WATER	DUP		11/06/00	INTEC	LF3-8	MONITORING WELL	N/A	2	2	2	2	2	2	2	2	2	2										
5OM039	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF3-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM040	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF3-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM041	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF3-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM042	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF2-8	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM043	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF2-9	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM044	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF2-10	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
5OM045	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF2-11	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										

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COMMENTS

AT1: Am-241
AT2: Gross Alpha/Beta
AT3: Tc-99
AT4: Mercury
AT5: Np-237
AT6: Tritium
AT7: Strontium-90
AT8: Pu Isotopes
AT9: Iodine-129
AT10: Uranium Isotopes

AT11:
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AT19:
AT20:

Plan Table Number: WAG3GROUP5(RD1)
SAP Number: ____________
Date: 05/17/00   Plan Table Revision: 0.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG 3 GROUP 5 OPERATION AND MAINTENANCE - ROUND 1   Project Manager: C. J. ROBERTS   SMO Contact: J. D. JACKSON

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										A4	AB	EA	HG	NP	R8	RB	RF	RI	UA										
50M046	REG	GROUND WATER	GRAB		11/06/00	INTEC	LF2-12	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M047	REG	GROUND WATER	GRAB		11/06/00	INTEC	MW-18	MONITORING WELL	N/A	1	1	1	1	1	1	1	1	1	1										
50M048	QC	WATER	RNST		11/06/00	INTEC	QC	EQUIPMNT RINSTE	N/A	1	1	1	1	1	1	1	1	1	1										

The sampling activity displayed on this table represents the first six characters of the sample identification number.
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COMMENTS

AT1: Am-241
AT2: Gross Alpha/Beta
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